SCS ENGINEERS

Transmittal

West Des Moines, IA

PROJECT:	Cass Co,FY24 Env.Comp,IA 27223098.24	DATE:	2/28/2024
SUBJECT:	Cass County Sanitary Landfill - 15-SDP-01-75P - 2023 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report	TRANSMITTAL ID:	00002
PURPOSE:	For your approval	VIA:	Info Exchange

FROM

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TO

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REMARKS:

Good Afternoon:

SCS Engineers, on behalf of the Cass County Environmental Control Agency, is submitting the attached 2023 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report. If you have any questions regarding this submittal, please contact us using the information below.

Thanks,

Sean A. Marczewski
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Transmittal

DATE: 2/28/2024
TRANSMITTAL ID: 00002

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	2/28/2024	Cass County Sanitary Landfill - 15-SDP-01-75P - 2023 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report v1.0.pdf	

COPIES:

Tim Buelow (SCS Engineers)
Sean Marczewski (SCS Engineers)
Brandi Mericle (Cass County Environmental Control Agency)

February 28, 2024
File No. 27223098.24

Mr. Geoff Spain
Iowa Department of Natural Resources
Land Quality Bureau
Wallace State Office Building
502 East 9th Street
Des Moines, Iowa 50319-0034

Subject: 2023 Annual Water Quality Report, 2023 Leachate Control System Performance Evaluation Report, and 2023 Landfill Gas Annual Report
Cass County Sanitary Landfill
Permit No. 15-SDP-01-75P

Dear Geoff:

SCS Engineers, on behalf of the Cass County Environmental Control Agency, has completed the required groundwater monitoring and statistical evaluation for the Cass County Sanitary Landfill (Landfill) for the year 2023. Services were performed in general accordance with Iowa Administrative Code (IAC) 567-113.10 and the current requirements for implementation of the Hydrologic Monitoring System Plan for the Landfill. Please find enclosed a copy of the 2023 Annual Water Quality Report.

Additionally, an evaluation of the leachate control system and gas monitoring results for the Landfill are included in accordance with IAC 567-113.7(5)"b"(14) and 113.9(2)"d," respectively. The 2023 Leachate Control System Performance Evaluation Report and the 2023 Landfill Gas Annual Report for the Landfill are included as appendices to the Annual Water Quality Report.

Please contact us if you have any questions or need additional information regarding the attached reports.

Sincerely,

Sean Marczewski
Project Professional
SCS Engineers

Timothy C. Buelow, P.E.
Project Director
SCS Engineers

SAM/TCB

Copies: Ms. Brandi Mericle, Cass County Environmental Control Agency

2023 Annual Water Quality Report, Leachate Control System Performance Evaluation Report, and Landfill Gas Annual Report

Cass County Sanitary Landfill
Solid Waste Permit No. 15-SDP-01-75P

Prepared for:

Cass County Environmental Control Agency
65928 Jackson Road
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SCS ENGINEERS

27223098.24 | February 28, 2024

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CERTIFICATION

Prepared by: _____ Date: 2/28/2024

Typed: Sean Marczewski

Reviewed by: _____ Date: 2/28/2024

Typed: Timothy C. Buelow, P.E.

Certification page (PE or groundwater scientist signature) **113.10(1)"d"**

For the purposes of this rule, a "qualified groundwater scientist" means a scientist or an engineer who has received a baccalaureate or postgraduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields demonstrated by state registration, professional certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action.

EXECUTIVE SUMMARY

Period of Report Coverage

The period of report coverage is from January – December 2023 and includes the sampling events included in Table 2.

Report Priority

The following summarizes report priorities associated with groundwater compliance at the Cass County Sanitary Landfill (Landfill):

- Department review urgency: The closure permit application was submitted on December 5, 2023 (Doc #108383).
- Department review impact on rules schedule: None.
- Actions or activities on hold pending Department review or comment: None.
- Actions and/or permit revisions needed: None.

Site Status and Applicable Rules

- Landfill Status: Closed. Closure permit submitted (Doc #108383).
- Types of waste accepted: Previously MSW and C&D
- Applicable IAC rules: 2009 567-113.10

Comments

- The following changes to the monitoring network were implemented beginning with the 2021 reporting period as a result of the approval of the Corrective Action Groundwater Monitoring Program (CAMP) (Doc #99435) in permit correspondence dated March 4, 2021 (Doc #99924):

  – During the 2022 reporting period corrective action monitoring wells MW-12 and MW-20 were replaced in the hydrologic monitoring system plan (HMSP) monitoring network by attenuation zone point of compliance (AZPOC) monitoring wells MW-43 and MW-24, respectively. Monitoring wells MW-12 and MW-20 will continue to be sampled semi-annually for Appendix I and TSS as source monitoring wells and annually evaluated for concentration trends only. AZPOC monitoring wells MW-43 and MW-24 will be sampled for Appendix I and TSS semi-annually as the new compliance points.

- Monitoring well MW-12 was dry during both semi-annual sampling events in this reporting period. Natural attenuation parameters will be sampled during the next sampling event when the point is not dry and then continued biennially. Monitoring well MW-20 was sampled for natural attenuation parameters during the 1st 2023 semi-annual sampling event and the next sampling event will occur in 2025.

- An SSL for cobalt in MW-11 was measured during the 2023 reporting period. However, review and update of the background data set for cobalt will occur prior to the Spring Sampling Notification in order to determine if the SSL is valid. In the event that the SSL is confirmed, the remedy outlined in the approved Assessment of Corrective Measures

report dated June 30, 2020 (Doc #97998) appears applicable for this potential SSL as it addressed this area of the site with MW-11 being clustered with MW-12.

ACRONYMS/ABBREVIATIONS

ACM = Assessment of Corrective Measures
CAMP = Corrective Action Groundwater Monitoring Program
CCV = Continuing Calibration Verification
C&D = Construction and Demolition
CL = Control Limit - Mean plus Two Standard Deviations
COC = Chain of Custody
DNR = Iowa Department of Natural Resources
DO = Dissolved Oxygen
DQR = Double Quantification Rule
GWPS = Groundwater Protection Standard
LEL = Lower Explosive Limit
LCL = Lower Confidence Limit
LCS = Laboratory Control Sample
LN = Lognormal
MCL = EPA Maximum Contaminant Level
MSW = Municipal Solid Waste
N = Normal
NC = No Change
NM = Not Measured
NP = Non-Parametric
ORP = Oxidation-Reduction Potential
P = Parametric
PL = Prediction Limit
RL = Reporting Limit
SWS = DNR Statewide Standard for a protected groundwater source
SSI = Statistically Significant Increase above background
SSL = Statistically Significant Level above groundwater protection standard
SSS = Site-Specific Standard (Site-Specific GWPS)
TSS = Total Suspended Solids
UCL = Upper Confidence Limit
VOC = Volatile Organic Compound

1.0 SITE BACKGROUND

1.1 SITE LOCATION

The Landfill property is depicted in Figure 1, Approved Monitoring Network. The Landfill property consists of approximately 90 acres and is located along Jackson Road, four miles southeast of Atlantic in Cass County, Iowa, and is located within the NE ¼, SE ¼, SE ¼ and Lot 4 in the SE ¼, SE ¼, NE ¼; SE ¼, and all that part E ½, SE ¼, NE ¼ lying south of the creek, also that part Lot 1 of Lot 5 lying North and East of the public highway in SE ¼, Section 13, Township 76 North, Range 36 West; and N ½ SW FR ¼, Section 18, Township 76 North, Range 35 West in Cass County, Iowa.

1.2 FACILITY

The Landfill includes the following contiguous areas: the closed northern waste footprint area (North Area), which had received solid waste since 1975, and covers approximately 27 acres, and the southern lateral expansion area (South Area), which covers approximately 11 acres and received permit approval on May 11, 2007. The North Area is contiguous with the South Area, which received solid waste after October 1, 2007; therefore, in accordance with IAC 567-113.2(4), both the North and South Areas are subject to regulations pursuant to the current IAC Chapter 113 rules. The closure permit application was submitted on December 5, 2023 (Doc #108383). Landfill personnel indicated that the Landfill property was previously used as agricultural land.

1.3 GEOLOGY AND HYDROGEOLOGY OF THE SITE

Previous hydrogeologic investigations of the Landfill property were conducted by Barker Lemar Engineering Consultants (Barker Lemar) as part of a lateral expansion design (2005 Lateral Expansion Plan dated November 10, 2005) and revisions dated September 2006 (Revised 2005 LEP – Doc 41703), both submitted by Barker Lemar, and Phase 2 Hydrogeological Investigation of the Cass County Sanitary Landfill Report, by James M. Montgomery Consulting Engineers, Inc., April 1991 (1991 HIR). Information from these reports was reviewed to create the summary below.

As stated in the 1991 HIR, surface soils within the Landfill area are derived from loess over sand to clay-rich glacial till over alluvial deposits. The surface soils at the site are described as loam, silty loam, and clayey loam. Geologic cross sections within the area indicate that a loess mantle approximately 15 to 20 feet thick caps the ridges on the site. Underneath the loess, a brown, sandy, silty clay glacial till is present with a maximum thickness of approximately 100 feet. Underlying the glacial till is an alluvial sand which was probably deposited directly on top of the bedrock with an approximate thickness of 10 to 37 feet. In the lowlands, a black silty sandy alluvium with an approximate thickness of 20 feet is located on top of the alluvial sand.

The Cretaceous Dakota Formation represents the uppermost bedrock unit within the Landfill area. The Dakota Formation is present in Southwest Iowa as erosional remnants forming the cap of buried bedrock ridges. The Dakota Formation generally consists of two members: the Woodbury Member and the Nishnabotna Member, with the latter being situated stratigraphically lower. The depth to bedrock ranges from 34 feet below ground surface (bgs) in the lowland areas to 134 feet bgs in the upland areas. According to the 1991 HIR, the Dakota sandstone is normally classified as a fair to high-yielding aquifer, which is or has been used as a water source by municipalities in Cass County. This indicates that the Dakota sandstone aquifer is a regional aquifer and, based on boring logs, underlies the Landfill area.

Based on the available historical information and observations made during the 2005 hydrogeologic investigation, two water bearing units have been identified at the site: the surficial water table system which occurs within the brown oxidized glacial till and the gray/brown glacial till transition zone, and a potentiometric aquifer located in the Dakota sandstone aquifer. According to the 1991 HIR, the uppermost aquifer is the Dakota sandstone; however, in the vicinity of the Landfill, the aquifer is confined. The confining layer is likely the overlying alluvium and glacial till layers. The available boring logs and hydrogeologic profiles indicate that a water table system has developed in the glacial till beneath the Landfill property.

The groundwater flow for the South Area was described in the 2005 Lateral Expansion Plan (LEP) as follows:

> *Since in the area of the proposed lateral expansion the shallow aquifer forms a divide, the groundwater in the northern (north) part of the lateral expansion area appears to flow north from the divide; groundwater in the southern (south) part of the expansion area appears to flow in a southwesterly direction. The observed average hydraulic gradient (i_h) of these flows for the north area was 0.074 ft/ft to the north; for the south area, 0.046 ft/ft to the southwest.*

Groundwater levels measured in monitoring wells screened within the Dakota sandstone indicate upward vertical gradients, as stated in the 1991 HIR:

> *The well clusters installed in the Dakota sandstone exhibit a positive hydraulic gradient, therefore, in the vicinity of the landfill, the Dakota sandstone is a confined aquifer.*

This indicates an upward gradient from the sandstone aquifer into the overlying alluvium and glacial till.

Vertical gradients measured in monitoring wells located within the surficial water table system indicate a negative or downward hydraulic gradient (Leachate Control Plan, Cass County Sanitary Landfill by James M. Montgomery Consulting Engineers, Inc., April 1992), which suggests a potential for vertical flow toward the deep, regional aquifer. As reported in the Groundwater Assessment Report (July 11, 2005, Barker Lemar) (2005 GWAR – Doc 22772):

> *…the surficial water table system at the site occurs entirely within the glacial till and alluvial deposits, but there is no evident aquitard between the water table and the bedrock aquifers. This would most likely be the cause for the vertical migration of the measured impact. The alluvial deposits are the parent material at the groundwater impact area. The alluvial deposits are more permeable compared to the till based on the available slug testing data. Therefore, the most likely path for horizontal movement of leachate impact leaving the site is northward and northeastward to the alluvium in the valley of the intermittent creek and Eller Branch Creek.*

The shallow groundwater contours generally appear to follow the original topographic contours. Shallow groundwater generally flows in a northerly direction in the North Area from the general vicinity of the topographic ridge and south to southwest in the South Area from the same ridge. The deep groundwater appears to follow a relatively flat but consistent gradient generally toward the north. However, following installation of the final cap over the North Area, both the localized groundwater flow direction and gradient have become more variable. The bedrock aquifer appears to be approximately 70 to 90 feet deeper than the surficial water table system beneath the South Area; however, the separation distance appears to decrease toward the north to less than 10 feet along

the north boundary of the North Area and likely comingles with the surficial water table system. Toward the south, the separation distance between the deep aquifer and the surficial water table is between 50 and 60 feet. According to the 2005 GWAR, the shallow groundwater is able to flow vertically downward into the sandstone aquifer.

The downward gradient from the surficial water table and the upward gradient from the Dakota sandstone aquifer could result in comingling of the groundwater from the two units along the north portion of the North Area where the separation distance between the two water bearing units decreases to less than ten feet.

2.0 FIGURES DISCUSSION

The following figures are attached.

2.1 FIGURE 1 – APPROVED MONITORING NETWORK

The Landfill property, hydrologic monitoring system plan (HMSP) monitoring network, and impact delineation monitoring points are depicted in Figure 1. Figure 1 indicates the respective monitoring programs of the HMSP monitoring points.

2.2 FIGURE 2 – GROUNDWATER CONTOURS – WATER TABLE AQUIFER

Groundwater contours were determined for the surficial water table system using the September 2023 groundwater elevation measurements and are shown in Figure 2. Groundwater contours associated with the surficial water table system beneath the Landfill are consistent with previous reporting periods. The groundwater flow is generally to the north beneath the closed North Area with low points to the northeast and northwest of the municipal solid waste landfill (MSWLF) unit boundary.

Leachate elevations are included on Figure 2 to visually compare to groundwater elevations but were not included in the contour development. It is not known whether the leachate elevations measured in the leachate piezometers are the result of intersection of perched leachate zones within the waste mass or a fully saturated waste mass in the vicinity of the monitoring point. It is also not known whether the leachate is in direct hydraulic communication with the water table or is perched above the water table within the waste mass.

2.3 FIGURE 3 – GROUNDWATER CONTOURS – DAKOTA SANDSTONE AQUIFER

Groundwater contours were determined for the Dakota Sandstone aquifer using the September 2023 groundwater elevation measurements and are shown on Figure 3. The apparent groundwater flow direction in the Dakota Sandstone aquifer beneath the Landfill was generally to the north with both easterly and westerly components of flow.

2.4 FIGURE 4 – REPORTING PERIOD DETECTION SUMMARY

Figure 4 shows the range of measured concentrations by monitoring point for the HMSP monitoring wells during this reporting period. Further discussion of the detected constituents is included in Section 6.0 – Data Evaluation and Summary of this report.

2.5 FIGURE 5 – ARSENIC CONCENTRATION MAP

Monitoring well MW-12 was dry during both 2023 semi-annual groundwater sampling events. The elevated arsenic concentrations in monitoring well MW-12, located northeast of the Landfill, are bracketed horizontally by monitoring well MW-43 to the west, MW-40 to the east, and MW-42 to the north. Monitoring well MW-12 is currently not vertically bracketed. Therefore, monitoring well MW-13 will be sampled as a vertical bracketing well beginning spring 2024. The MSWLF unit is located to the south of MW-12.

Arsenic concentrations in monitoring well MW-20 were measured above the background concentration of 0.002941 mg/L. Arsenic concentrations in monitoring well MW-20, located northwest of the Landfill, are bracketed horizontally by monitoring wells MW-10, MW-24, MW-26, and MW-45 and vertically by monitoring well MW-19.

2.6 FIGURE 6 – BARIUM CONCENTRATION MAP

Barium concentrations measured in monitoring well MW-20 measured above the background value of 0.3136 mg/L. Concentrations in horizontal bracketing monitoring wells to the west, northwest and north, MW-10, MW-45, MW-46, and MW-47, measured barium concentrations generally below the background concentration. Monitoring wells MW-19, MW-21, MW-24, MW-26, MW-37R, MW-44, and MW-48, located east/northeast of MW-20, have measured concentrations below the GWPS but slightly above the background concentration. Based on the distance of these wells from the Landfill, it is likely that the somewhat elevated barium concentrations may be naturally occurring in this portion of the site. Vertical bracketing well MW-9 measured barium concentrations below the background indicating that barium is both vertically and horizontally bracketed.

2.7 FIGURE 7 – COBALT CONCENTRATION MAP

A new SSL for cobalt was measured in monitoring well MW-11 during the 2023 reporting period. Cobalt concentrations were measured during the 2022 and 2023 reporting period in monitoring well MW-23 to the west, which measured cobalt concentrations below the background concentration of 0.00138 mg/L. Monitoring well MW-41 to the east measured cobalt concentrations below background during the 2018 and 2019 reporting. Additional sampling efforts will be required to assess the bracketing status of the elevated cobalt concentrations measured in monitoring well MW-11.

3.0 STANDARDS HISTORY GRAPHS

Standards history graphs are included in Appendix G. Standards history graphs for the following parameters are included:

Water Table:

- Antimony
- Arsenic
- Barium
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Nickel
- Selenium
- Vanadium
- Zinc

Dakota Sandstone:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Nickel
- Selenium
- Silver
- Vanadium
- Zinc

4.0 QA/QC SUMMARY

The quality assurance/quality control (QA/QC) program for the Landfill follows similar protocols as included in the HMSP. Data validation procedures are performed on analytical results for laboratory quality control samples and a quality assurance assessment of the data is conducted as the data are generated. The QA review procedure provides documentation of the accuracy and precision of the analytical data and confirms that the analyses are sufficiently sensitive to detect constituents at levels below regulatory standards when technically feasibly with the laboratory method utilized and where such standards exist. SCS then conducts QA/QC data validation of the produced data, which includes review of sample handling, analytical sensitivity, and blanks, accuracy, and precision. A summary of the laboratory QA/QC and data validation can be found in Appendices B-1, Laboratory Data, and B-2, Data Validation, respectively. The QA/QC review indicated that the data was acceptable.

5.0 DATA EVALUATION AND SUMMARY

Assessment/corrective action monitoring statistical evaluation in accordance with the requirements of IAC 567-113.10(6) were conducted for the groundwater analytical data collected during the 2023 reporting period. The statistical evaluation for samples collected during this reporting period is located in Appendix D, Statistical Method and Output, of this report.

The HMSP monitoring network at the Landfill consists of fourteen monitoring points, with background wells MW-15R (Water Table) and MW-22 (Dakota Sandstone) located southeast and south of the Landfill, respectively. The HMSP monitoring network also includes two source characterization monitoring wells: MW-12 (Water Table) located northeast of the landfill, and MW-20 (Water Table) to the north-northwest of the Landfill. Compliance monitoring points are located on downgradient perimeters of the Landfill. The range of measured concentrations for detected constituents during this reporting period is shown in Figure 4, Reporting Period Detection Summary.

5.1 DATA EVALUATION

Site-wide maximum concentrations for metals for each water bearing unit were detected in monitoring wells around the Landfill during the 2023 semi-annual sampling events. This indicates that metals may be at least in part partially naturally occurring around the Landfill. SSIs were measured in monitoring wells north and northwest of the Landfill. A majority of the site-wide maximum metals concentrations for the Water Table aquifer were found in monitoring well MW-20, located north of the Landfill. Additional site-wide maximum metal concentrations were also detected in monitoring wells MW-24, MW-37R, MW-39, and monitoring point UD-0. A majority of site-wide maximum metals concentrations for the Dakota Sandstone aquifer were found in monitoring well MW-11. Additionally, cobalt was measured at a statistically significant level above the GWPS in monitoring well MW-11 during this reporting period. Monitoring well MW-36 had three site-wide maximum metal concentrations.

Site-wide maximum volatile organic compound (VOC) concentrations for the Water Table were found in monitoring well MW-20. There were no VOC detections in the Dakota Sandstone aquifer during the 2023 reporting period except for two J-flag detections (a result less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value) for chlorobenzene and cis-1,2-dichloroethene in monitoring well MW-11.

Monitoring wells MW-43 and MW-24 were added to the HMSP monitoring network during the 2021 reporting period as AZPOC monitoring wells to replace monitoring wells MW-12 and MW-20,

respectively. Monitoring well MW-43 was sampled for Appendix I constituents and TSS during both sampling events this reporting period. Monitoring well MW-24 was sampled for TSS during both reporting period sampling events and Appendix II and Appendix I during the spring and fall sampling events, respectively. SSL constituents measured in each monitoring well were below their respective GWPS concentration.

5.2 CORRECTIVE ACTION GROUNDWATER MONITORING PROGRAM REMEDY DISCUSSION

An Assessment of Corrective Measures (ACM) Report was submitted on June 30, 2020 (Doc #97998) and approved in permit correspondence dated September 21, 2020 (Doc #98498). The Selection of Remedy and Corrective Action Groundwater Monitoring Program (CAMP) was submitted January 12, 2021 (Doc #99435) and approved in the Permit Correspondence dated March 4, 2021 (Doc #99924). The selected remedy was source control via final cover with monitored natural attenuation (MNA). As stated in the ACM, the source control is installed and operational.

Natural attenuation processes are addressing at least a portion of the groundwater impact at the Landfill. Biennial natural attenuation sampling was approved in the CAMP for monitoring wells MW-12 and MW-20. The first natural attenuation sample was obtained from monitoring wells MW-12 and MW-20 during the 1st 2021 semi-annual sampling event. A natural attenuation sample was obtained from monitoring well MW-20 during the 1st 2023 semi-annual sampling event. Monitoring well MW-12 was dry during both 2023 semi-annual sampling events and a natural attenuation sample was not obtained. Trending of the natural attenuation parameters by Mann-Kendall analysis was not evaluated as only two sampling events for monitoring well MW-20 and one sampling event for monitoring well MW-12 have occurred since 2021. Nitrate concentrations increased in monitoring well MW-20 between the 2021 and 2023 sampling events while iron, manganese, and sulfate concentrations remained stable or decreased. Natural attenuation data will be obtained during the next successful sampling attempt for monitoring well MW-12. Natural attenuation sampling will occur next for monitoring well MW-20 in 2025 and an evaluation of available data will be included in the 2025 AWQR.

6.0 RECOMMENDATIONS

6.1 SITE IMPACT ON GROUNDWATER

- Groundwater impact within the surficial water table is in source characterization monitoring wells MW-12 and MW-20 to the northeast and northwest of the North Area of the MSWLF unit, respectively. AZPOC monitoring well MW-43, which replaced monitoring well MW-12 in the HMSP monitoring network, measured non-detect or low concentrations of the Appendix I constituents during this reporting period. An SSI was indicated during the 1st 2023 statistical evaluation for selenium in monitoring well MW-43. Retesting occurred in July 2023 prior to the 2nd 2023 semi-annual sampling event and the SSI was not confirmed. AZPOC monitoring well MW-24, which replaced monitoring well MW-20 in the HMSP monitoring network, had measured barium, cadmium, cobalt, and nickel concentrations above the background but below the GWPS.

- Significant groundwater impact does not appear to be present within the Dakota Sandstone aquifer. An SSL for cobalt was measured in monitoring well MW-11 during this reporting period. Further review is needed in order to determine if the SSL is valid and what impact it may have on groundwater within the Dakota Sandstone aquifer.

6.2 PROPOSED MONITORING

- Monitoring point UD-1 has been dry since the monitoring point was added to the HMSP monitoring network with the exception of the 1st 2020 semi-annual sampling event. This point will be statistically evaluated with intrawell prediction limits once a sufficient dataset has been obtained. Detection monitoring will continue for UD-0 and UD-1.

- Assessment monitoring will continue for monitoring wells MW-19, MW-21, MW-37R, MW-38R, and MW-39R that are screened in the water table and monitoring wells MW-23, and MW-36 that are screened in the Dakota Sandstone formation. It has not yet been determined what monitoring program monitoring well MW-11 will fall under during the 2024 reporting period. An SSL for cobalt was measured during this reporting period. Review and update of the background data set for cobalt will occur prior to the Spring Sampling Notification in order to determine if the SSL is valid. In the event that the SSL is confirmed, the remedy outlined in the approved Assessment of Corrective Measures report dated June 30, 2020 (Doc #97998) appears applicable for this potential SSL as it addressed this area of the site with MW-11 being clustered with MW-12. Sampling for the full list of Appendix II constituents is scheduled for 2025 for monitoring wells MW-37R and MW-38R, 2026 for monitoring well MW-11, 2027 for monitoring wells MW-19, MW-21, MW-23, and MW-36, and MW-39, and 2028 for monitoring well MW-24.

- Semi-annual Appendix I and TSS sampling will continue for AZPOC monitoring wells MW-43 and MW-24.

6.3 PROPOSED MONITORING WELL CHANGES

It is proposed that monitoring well MW-13 be added to the monitoring network as a bracketing well to vertically bracket arsenic in monitoring well MW-12. Monitoring well MW-13 appears suitable as a vertical bracketing well as it is nested with monitoring well MW-12 and the screened interval in monitoring well MW-13 is approximately 10 feet below the screened interval in monitoring well MW-12.

Monitoring well MW-11 could potentially move from the Assessment Monitoring program into the Corrective Action monitoring program if the cobalt SSL is confirmed following further review of the background data set.

Tables

Table 1
Monitoring Program Summary Table
2023 Annual Water Quality Report
Cass County Landfill
Permit No. 15-SDP-01-75P

Monitoring Well	Formation[1]	Current Monitoring Program	Change for Next Sampling Event	SSIs	Constituents with SSLs	Total Number of Samples in Each Monitoring Program		
						Detection (organic/ inorganic)	Assessment (organic/ inorganic)	Corrective Action (organic/ inorganic)
HMSP Monitoring Points - Water Table								
MW-15R	Clay with sand seam and trace gravel	Background	No change	Not Applicable	Not Applicable	29/17	-	-
MW-12	Clayey silt with alluvium	Source	No change	Not Applicable	Not Applicable	-	-	23/13
MW-19	Alluvial clay	Assessment[2]	No change	Barium, Benzene, Chlorobenzene, Cobalt, Nickel	None	-	36/17	-
MW-20	Clayey sand with alluvium	Source	No change	Not Applicable	Not Applicable	-	-	33/17
MW-21	Glacial till	Assessment	No change	Barium, Cobalt, Nickel	None	-	32/17	-
MW-24	Sandy clay	Corrective Action	No change	Barium, Cadmium, Cobalt, Nickel	None	-	6/6	-
MW-37R	Brown silty sand	Assessment	No change	Barium, Cobalt, Lead, Nickel, Selenium	None	-	12/12	-
MW-38R	Brown sand and gray silty sand	Assessment	No change	Nickel, Selenium	None	-	12/12	-
MW-39	Brown sandy clay	Assessment[2]	No change	Selenium, Thallium	None[2]	-	-	34/15
MW-43	Sandy silty clay	Corrective Action	No change	Barium, Cobalt, Nickel, Selenium	Not Applicable	5/5	-	-
UD-0	Not applicable	Detection	No change	None[3]	Not Applicable	7/5	-	-
UD-1	Not applicable	Detection	No change	None[3]	Not Applicable	1/1	-	-
HMSP Monitoring Points - Dakota Sandstone								
MW-22	Sandstone	Background	No change	Not Applicable	Not Applicable	33/17	-	-
MW-11	Sandstone	Assessment	No change[4]	Arsenic, Barium, Cobalt, Nickel, Silver, Thallium	Cobalt	-	34/17	-
MW-23	Not Available	Assessment	No change	Thallium	None	-	36/17	-
MW-36	Brown sand	Assessment	No change	Cadmium, Cobalt, Lead, Nickel, Vanadium	None	-	32/17	-
Other Monitoring Points								
MW-6	Glacial till	Plume delineation for SSL constituents						
MW-10	Glacial till	Plume delineation for SSL constituents						
MW-13	Sandstone	Plume delineation for SSL constituents						
MW-18	Glacial till	Plume delineation for SSL constituents						
MW-26	Sand with gravel	Plume delineation for SSL constituents						
MW-29	Glacial till	Water level						
MW-30	Glacial till	Plume delineation for SSL constituents						
MW-31	Glacial till	Plume delineation for SSL constituents						
MW-32	Sandstone	Plume delineation for SSL constituents						
MW-35	Glacial till	Water level						
MW-40	Brown sandy clay with trace gravel	Plume delineation for SSL constituents						
MW-41	Gray sandy silt	Plume delineation for SSL constituents						
MW-42	Sandy silty clay	Plume delineation for SSL constituents						
MW-44	Sandy silty clay	Plume delineation for SSL constituents						
MW-45	Sandy silty clay	Plume delineation for SSL constituents						
MW-46	Sandy silty clay	Plume delineation for SSL constituents						
MW-47	Sandy silty clay	Plume delineation for SSL constituents						
MW-48	Silty clay with sand seam	Plume delineation for SSL constituents						

Notes:
[1] Obtained from screened interval on boring logs and/or cross sections.
[2] Monitoring wells MW-19 and MW-39 were returned to the assessment monitoring program following the evaluations included in the Assessment of Corrective Measures (Doc # 97998). The selenium exceedance in MW-39 is not considered an SSL since it is not caused by Landfill impact.
[3] Insufficient data has been obtained to perform detection monitoring analyses at this time.
[4] Pending further review of the measured cobalt SSL.

Comments:
1) A single exceedance in an assessment monitoring well is recorded above as an SSI. Retesting is not performed as these monitoring wells are not in the detection monitoring program.
SSL - Statistically Significant Level above groundwater protection standard.
SSI - Statistically Significant Increase above background.

Table 2
Monitoring Program Implementation Schedule
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Monitoring Well	Recent Sampling Dates and Constituents			Upcoming Sampling Dates and Constituents		Full Appendix II Sample Dates	
	March 2023	July 2023	September 2023	1st 2024 Semi-Annual	2nd 2024 Semi-Annual	Previously Collected	Next Event
HMSP Monitoring Points - Water Table							
MW-15R	Appendix I, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	Not Applicable	Not Applicable
MW-12	None (Dry)		None (Dry)	Appendix I, TSS, Natural Attenuation Parameters	Appendix I, TSS	8/21/2009, 8/31/2010, 3/28/2016, 5/6/2021	Not Applicable
MW-19	Appendix I, TSS, Gamma-chlordane, Sulfide		Appendix I, TSS, Gamma-chlordane, Sulfide	Appendix I, Gamma-chlordane, Sulfide, TSS	Appendix I, Gamma-chlordane, Sulfide, TSS	7/7/2011, 10/9/2012, 3/27/2017, 4/6/2022	2027
MW-20	Appendix I, TSS, 2,4,5-T, Endosulfan I, Sulfide, Natural Attenuation Parameters		Appendix I, TSS, 2,4,5-T, Endosulfan I, Sulfide	Appendix I, 2,4,5-T [2C], Endosulfan I, Sulfide, TSS	Appendix I, 2,4,5-T [2C], Endosulfan I, Sulfide, TSS	8/21/2009, 8/31/2010, 10/27/2011, 2/15/2016, 5/6/2021	Not Applicable
MW-21	Appendix I, TSS, Sulfide		Appendix I, TSS, Sulfide	Appendix I, Sulfide, TSS	Appendix I, Sulfide, TSS	7/7/2011, 10/9/2012, 3/27/2017, 4/7/2022	2027
MW-24†	Appendix II, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	9/29/2022, 3/9/2023	2028
MW-37R	Appendix I, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	3/30/2020, 11/17/2020	2025
MW-38R	Appendix I, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	3/30/2020, 11/17/2020	2025
MW-39	Appendix II, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	7/7/2011, 10/9/2012, 3/27/2017, 4/8/2022	2027
MW-43†	Appendix I, TSS	Selenium, TSS	Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	8/23/2022	Not Applicable
UD-0	Appendix I, TSS, Geochemistry Parameters		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	Not Applicable	Not Applicable
UD-1	None (Dry)		None (Dry)	Appendix I, TSS	Appendix I, TSS	Not Applicable	Not Applicable

Table 2
Monitoring Program Implementation Schedule
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HMSP Monitoring Points - Dakota Sandstone							
MW-22	Appendix I, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	Not Applicable	Not Applicable
MW-11	Appendix I, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	8/21/2009, 8/31/2010, 10/27/2011, 2/15/2016, 5/6/2021	2026
MW-23	Appendix II, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	7/7/2011, 10/9/2012, 3/27/2017, 4/7/2022	2027
MW-36	Appendix II, TSS		Appendix I, TSS	Appendix I, TSS	Appendix I, TSS	7/7/2011, 10/9/2012, 3/27/2017, 4/7/2022	2027

Notes

† - Attenuation zone point of compliance wells.

TSS - Total Suspended Solids

Natural Attenuation Parameters Include: Iron, Nitrate, Manganese, and Sulfate.

Geochemistry Parameters Include: Bicarbonate, Carbonate, Calcium, Chloride, Magnesium, Potassium, Sodium, and Sulfate.

Table 3
Monitoring Well Maintenance and Performance Re-Evaluation Schedule
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Compliance with:	2021	2022	2023	2024	2025
567 IAC 113.10(2)"f"(1) high and low water levels	Completed	Completed	Included[1]	Scheduled	Scheduled
567 IAC 113.10(2)"f"(2) changes in the hydrologic setting and flow paths	Completed	Completed	Included[2]	Scheduled	Scheduled
567 IAC 113.10(2)"f"(3) well depths	Completed	Completed	Included[1]	Scheduled	Scheduled
567 IAC 113.10(2)"f"(4) well recharge rates and chemistry		Completed		Scheduled	
Waste separation from ground water 113.6(2)i	Completed	Completed	Included[1]	Scheduled	Scheduled

Notes:

[1] See Table 4.

[2] See Section 3.2 of this report.

Table 4
Monitoring Well Performance and Maintenance Summary
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Well	Top of Casing	Top of Screen	Total Depth	Datum	Date of Measurements		Maximum Depth Discrepancy (ft)
					3/2023	9/2023	
MW-15R	145.46	118.9	37.1	Groundwater Level (ft)	27.02	27.90	-0.1
				Groundwater Elevation (Ft MSL)	118.44	117.56	
				Measured Well Depth (ft)	37.2	37.2	
				Submerged screen	N	N	
MW-12	44.43	34.6	19.9	Groundwater Level (ft)	Dry	Dry	-0.1
				Groundwater Elevation (Ft MSL)	NA	NA	
				Measured Well Depth (ft)	20.0	19.9	
				Submerged screen	N	N	
MW-19	48.60	11.9	41.7	Groundwater Level (ft)	20.71	21.62	0.1
				Groundwater Elevation (Ft MSL)	27.89	26.98	
				Measured Well Depth (ft)	41.6	41.6	
				Submerged screen	Y	Y	
MW-20	48.51	31.8	26.7	Groundwater Level (ft)	12.82	16.60	-0.1
				Groundwater Elevation (Ft MSL)	35.69	31.91	
				Measured Well Depth (ft)	26.8	26.7	
				Submerged screen	Y	Y	
MW-21	72.98	52.8	30.1	Groundwater Level (ft)	12.37	13.23	1.4
				Groundwater Elevation (Ft MSL)	60.61	59.75	
				Measured Well Depth (ft)	28.8	28.7	
				Submerged screen	Y	Y	
MW-24	44.60	22.6	32.0	Groundwater Level (ft)	16.98	18.02	0.3
				Groundwater Elevation (Ft MSL)	27.62	26.58	
				Measured Well Depth (ft)	31.7	31.7	
				Submerged screen	Y	Y	
MW-37R	62.91	30.5	43.6	Groundwater Level (ft)	34.62	36.13	1.0
				Groundwater Elevation (Ft MSL)	28.49	26.78	
				Measured Well Depth (ft)	43.9	42.6	
				Submerged screen	N	N	
MW-38R	74.19	34.6	50.6	Groundwater Level (ft)	46.62	47.37	0.4
				Groundwater Elevation (Ft MSL)	27.57	26.82	
				Measured Well Depth (ft)	50.2	50.3	
				Submerged screen	N	N	
MW-39	111.90	99.2	32.7	Groundwater Level (ft)	17.53	16.76	0.3
				Groundwater Elevation (Ft MSL)	94.37	95.14	
				Measured Well Depth (ft)	32.4	32.4	
				Submerged screen	N	N	
MW-22	93.30	-15.5	118.8	Groundwater Level (ft)	63.23	64.19	NM
				Groundwater Elevation (Ft MSL)	30.07	29.11	
				Measured Well Depth (ft)	NM	NM	
				Submerged screen	Y	Y	
MW-11	44.62	8.6	46.0	Groundwater Level (ft)	19.02	19.68	0.2
				Groundwater Elevation (Ft MSL)	25.60	24.94	
				Measured Well Depth (ft)	46.0	45.8	
				Submerged screen	Y	Y	
MW-23	69.01	16.8	62.2	Groundwater Level (ft)	40.88	41.67	NM
				Groundwater Elevation (Ft MSL)	28.13	27.34	
				Measured Well Depth (ft)	NM	NM	
				Submerged screen	Y	Y	
MW-36	72.22	29.7	62.8	Groundwater Level (ft)	44.30	43.93	5.2
				Groundwater Elevation (Ft MSL)	28.13	28.29	
				Measured Well Depth (ft)	57.6	62.5	
				Submerged screen	N	N	
MW-43	41.54	27.9	23.6	Groundwater Level (ft)	18.73	19.42	-0.2
				Groundwater Elevation (Ft MSL)	22.81	22.12	
				Measured Well Depth (ft)	23.8	23.7	
				Submerged screen	N	N	

Comments:

1) Monitoring wells with dedicated sampling pumps are measured once every five years.
2) Measured well depths were within 1.4 foot of the installed depths with the following exception:
   MW-36: The March 2023 well depth measurement was 5.2 feet shallower than the installed depth, but the September 2023 measurement was within 0.3 feet of the installed depth. The March 2023 measurement was likely anomalous.
3) The casing for monitoring well MW-37R was shortened by 0.2 feet after the March 2023 sampling event. Top of casing elevation was reduced from 63.11' to 62.91'
4) The casing for monitoring well MW-36 was shortened by 0.21 feet after the March 2023 sampling event. Top of casing elevation was reduced from 72.43' to 72.22'

Groundwater Underdrain Piezometer

Well		Date of Measurements	
		3/2023	9/2023
GWPZ-1	Bottom of waste (feet MSL)	115.27	
	Groundwater Elevation (feet MSL)	102.95	102.90
	Separation distance compliant?	Yes	Yes

Table 5
Background and GWPS Summary Tables
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Interwell Background/GWPS - Water Table (MW-15R)

Constituent	Units	Samples	Detections	Min	Max	Mean	Background Level	Statistical Test	GWPS	Source
Antimony (Sb)	mg/L	17	2	0.000255*	0.00165*	0.000759118	0.00165	PL (NP)	0.006	MCL
Arsenic (As)	mg/L	17	9	0.000543*	0.00284	0.001084176	0.002941	PL (P)	0.01	MCL
Barium (Ba)	mg/L	17	17	0.168	0.306	0.218176471	0.3136	PL (P)	2.0	MCL
Beryllium (Be)	mg/L	17	0	0.0005 (1/2 RL)	0.0005 (1/2 RL)	0.0005	< 0.001	DQR	0.004	MCL
Cadmium (Cd)	mg/L	17	4	0.00004*	0.00025 (1/2 RL)	0.000108176	0.00025	PL (NP)	0.005	MCL
Chromium (Cr)	mg/L	17	6	0.000743*	0.00431*	0.002127647	0.00431	PL (NP)	0.1	MCL
Cobalt (Co)	mg/L	17	6	0.00007*	0.00102	0.000307529	0.00102	PL (NP)	0.04962	SSS
Copper (Cu)	mg/L	17	2	0.000886*	0.0025 (1/2 RL)	0.002232118	0.0025	PL (NP)	1.3	MCL
Lead (Pb)	mg/L	17	1	0.00025 (1/2 RL)	0.000518	0.000265765	0.000518	PL (NP)	0.015	MCL
Nickel (Ni)	mg/L	17	3	0.000679*	0.0025 (1/2 RL)	0.002296412	0.0025	PL (NP)	0.1	SWS
Selenium (Se)	mg/L	17	11	0.001*	0.0025 (1/2 RL)	0.001769412	0.0025	PL (NP)	0.05	MCL
Silver (Ag)	mg/L	17	0	0.00025 (1/2 RL)	0.0005 (1/2 RL)	0.0004852 94	< 0.001	DQR	0.1	SWS
Thallium (Tl)	mg/L	17	0	0.0005 (1/2 RL)	0.001 (1/2 RL)	0.000529412	< 0.002	DQR	0.002	MCL
Vanadium (V)	mg/L	17	4	0.000337*	0.00323*	0.002181706	0.00323	PL (NP)	0.035	SWS
Zinc (Zn)	mg/L	17	1	0.005 (1/2 RL)	0.0108*	0.009164706	0.0108	PL (NP)	2.0	SWS

Interwell Background/GWPS - Dakota Sandstone (MW-22)

Constituent	Units	Samples	Detections	Min	Max	Mean	Background Level	Statistical Test	GWPS	Source
Antimony (Sb)	mg/L	16	11	0.000202*	0.00651	0.001548	0.007449	PL (P)	0.007449	SSS
Arsenic (As)	mg/L	17	6	0.000577*	0.00157*	0.000984	0.00157	PL (NP)	0.01	MCL
Barium (Ba)	mg/L	17	17	0.208	0.304	0.253471	0.3021	PL (P)	2.0	MCL
Beryllium (Be)	mg/L	17	1	0.000083*	0.0005 (1/2 RL)	0.000475	0.0005	PL (NP)	0.004	MCL
Cadmium (Cd)	mg/L	17	4	0.00005 (1/2 RL)	0.000307	0.000157	0.000307	PL (NP)	0.005	MCL
Chromium (Cr)	mg/L	17	2	0.00065*	0.00323*	0.002434	0.00323	PL (NP)	0.1	MCL
Cobalt (Co)	mg/L	17	4	0.00008*	0.00138	0.000321	0.00138	PL (NP)	0.003981	SSS
Copper (Cu)	mg/L	17	3	0.00199*	0.0164	0.003385	0.0164	PL (NP)	1.3	MCL
Lead (Pb)	mg/L	17	5	0.00025 (1/2 RL)	0.000765	0.000316	0.000765	PL (NP)	0.015	MCL
Nickel (Ni)	mg/L	17	3	0.00065*	0.0095	0.002919	0.0095	PL (NP)	0.1	SWS
Selenium (Se)	mg/L	17	14	0.000798*	0.0025 (1/2 RL)	0.001628	0.002324	PL (P)	0.05	MCL
Silver (Ag)	mg/L	17	2	0.000156*	0.000651*	0.000474	0.000651	PL (NP)	0.1	SWS
Thallium (Tl)	mg/L	17	1	0.0005 (1/2 RL)	0.001 (1/2 RL)	0.000544	0.001	PL (NP)	0.002	MCL
Vanadium (V)	mg/L	17	16	0.0011*	0.0038*	0.001699	0.003303	PL (P)	0.035	SWS
Zinc (Zn)	mg/L	17	4	0.00769*	0.0974	0.015341	0.0974	PL (NP)	2.0	SWS

Notes:

1) Background levels based on calculated prediction limits or reporting limit, as applicable, unless a site-specific standard was otherwise approved.
2) Site-specific GWPSs for cobalt using tolerance limits for the water table aquifer and the Dakota sandstone were calculated in the AWQR 2018 statistical analyses and approved by the DNR on July 22, 2019 (Doc #95584). The background data set will be reevaluated during the 2024 reporting period.

Acronyms/Abbreviations:

RL = Reporting Limit
GWPS = Groundwater Protection Standard
DQR = Double Quantification Rule
SSS = Site-Specific GWPS
SWS = Statewide Standard
PL = Prediction Limit
MCL = EPA Maximum Contaminant Level
NP = Non-Parametric
P = Parametric

Comments:

1) **Water quality results and effectiveness of the statistical data evaluation criteria:** Statistical analyses consist of prediction limits and confidence intervals/confidence bands, as appropriate, and do not use data from the background wells for development of the confidence interval or confidence bands.
2) **Changes to the previous statistical method during reporting period:** There were no changes to the statistical method during the 2023 reporting period.
3) **Re-sampling strategy:** Retesting is performed on a 1-of-2 retesting scheme.
4) **Justification for data exclusion:** Inorganic data collected prior to the July 2015 semi-annual sampling event was not considered in this statistical evaluation. Monitoring wells were developed and low-flow equipment installed prior to the 2nd 2015 semi-annual sampling event. Since well development and implementation of low-flow sampling techniques, TSS concentrations have decreased and inorganic samples collected prior to the 2nd 2015 semi-annual sampling event are no longer considered representative of the groundwater at the site.

Table 6
Summary of Well/Detected Constituent Pairs With No Previous SSIs
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Well	Constituent	Units	Most Recent Result	Background Standard
Water Table				
MW-21	Nickel	mg/L	0.00444*	0.0025
MW-38R	Nickel	mg/L	0.00409*	0.0025
MW-39	Thallium	mg/L	0.003065	< 0.002
MW-43	Barium	mg/L	0.348	0.3136
	Cobalt	mg/L	0.013	0.00102
Dakota Sandstone				
MW-11	Silver	mg/L	0.00111	0.000651
	Thallium	mg/L	0.00789	0.001
MW-23	Thallium	mg/L	0.0015	0.001
MW-36	Cadmium	mg/L	0.000656	0.000307
	Lead	mg/L	0.00215	0.000765
	Vanadium	mg/L	0.01010	0.003303

Notes:

1) Criteria for inclusion in this table is a well/constituent pair with an indicated SSI during this current reporting period and no SSI in the immediately preceding reporting period.
2) A single exceedance in an assessment monitoring well is recorded above as an SSI. Retesting is not performed as these monitoring wells are not in the detection monitoring program.

* - J flag; concentration is below the reporting limit but above the MDL, the concentration is estimated.

Comments:

1) **Problems with the current detection network:** Four SSIs above background were detected in UD-0 following the 1st 2016 semi-annual statistical evaluation. Two samples were collected from UD-0 during this reporting period and have been the only samples collected since initial detection in 2016. In addition, samples from UD-0 are collected in a significantly different manner from those collected from monitoring wells; therefore, UD-0 will be analyzed using intrawell prediction limit analysis when sufficient samples are available. UD-1 has been dry since added to the HMSP network, with the exception of the 1st 2020 semi-annual sampling event.
2) **Schedule to implement remedies:** Not applicable.
3) **Alternative constituent or sample frequency changes:** None.
4) **Significant changes to calculated prediction limits:** UD-0 and UD-1 will be moved to intrawell prediction limit analysis once a sufficient dataset has been obtained.
5) **Resampling strategy:** Retesting is performed on a 1-of-2 retesting scheme.
6) **Data exclusion justification:** Inorganic data collected prior to the July 2015 semi-annual sampling event was not considered in this statistical evaluation. Monitoring wells were developed and low-flow equipment installed prior to the 2nd 2015 semi-annual sampling event. Since well development and implementation of low-flow sampling techniques, TSS concentrations have decreased and inorganic samples collected prior to the 2nd 2015 semi-annual sampling event are no longer considered representative of the groundwater at the site.

Table 7
Summary Table of Ongoing and Newly Identified SSIs
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Well	Constituent	Units	Most Recent Result	Background Standard	Lower Confidence Limit	GWPS	Sample Dates		
							Initial Exceedance	Resample(s)	5th background sample
Water Table									
MW-19	Barium	mg/L	1.24	0.3136	1.082	2	3/2023	NA	11/2017
	Benzene	µg/L	0.733	< 0.5	0.4613	5	7/2011	10/2011	12/2008
	Chlorobenzene	µg/L	1.49	< 0.1	0.6033	100	5/2021	NA	12/2008
	Cobalt	mg/L	0.0238	0.00102	0.01781	0.04962	3/2023	NA	11/2017
	Nickel	mg/L	0.0431	0.0025	0.04931	0.1	3/2023	NA	11/2017
MW-21	Barium	mg/L	1.24	0.3136	0.8491	2	3/2023	NA	11/2017
	Cobalt	mg/L	0.00468	0.00102	0.00167	0.04962	3/2023	NA	11/2017
	Nickel	mg/L	0.00444*	0.0025	0.002052	0.1	3/2023	NA	11/2017
MW-24	Barium	mg/L	0.712	0.3136	0.695	2	3/2023	NA	11/2017
	Cadmium	mg/L	0.000776	0.00025	0.0004036	0.005	3/2023	07/2022	11/2017
	Cobalt	mg/L	0.00323	0.00102	0.001243	0.04962	3/2023	07/2022	08/2022
	Nickel	mg/L	0.0239	0.0025	0.00272	0.1	3/2023	07/2022	11/2017
MW-37R	Barium	mg/L	0.693	0.3136	0.7581	2	3/2023	02/2020	12/2019
	Cobalt	mg/L	0.00121	0.00102	0.0002667	0.04962	9/2023	NA	12/2019
	Lead	mg/L	0.00135	0.000518	0.000559	0.015	3/2023	02/2020	12/2019
	Nickel	mg/L	0.0127	0.0025	0.004671	0.1	9/2023	02/2020	12/2019
	Selenium	mg/L	0.0558	0.0025	0.00458	0.05	3/2023	02/2020	12/2019
MW-38R	Nickel	mg/L	0.00409*	0.0025	0.003664	0.1	3/2023	02/2020	12/2019
	Selenium	mg/L	0.0264	0.0025	-0.0005102	0.05	3/2023	02/2020	12/2019
MW-39	Selenium	mg/L	0.07505	0.0025	0.0729	0.05	3/2023	NA	11/2017
	Thallium	mg/L	0.003065	< 0.002	0.0005	0.002	9/2023	NA	11/2017
MW-43	Barium	mg/L	0.348	0.3136	ISE	2	9/2023	NA	ISE
	Cobalt	mg/L	0.013	0.00102	ISE	0.04962	9/2023	NA	11/2017
	Nickel	mg/L	0.0059	0.0025	ISE	2	9/2023	02/2020	12/2019
	Selenium	mg/L	<0.005	0.0025	ISE	0.05	3/2023	NA	12/2019
UD-0	None								
UD-1	No Samples								
Dakota Sandstone									
MW-11	Arsenic	mg/L	0.0145	0.00157	0.001732	0.01	3/2023	NA	11/2017
	Barium	mg/L	0.636	0.3021	0.3935	2	3/2023	NA	11/2017
	Cobalt	mg/L	0.0113	0.00138	0.005927	0.003981	3/2023	NA	11/2017
	Nickel	mg/L	0.0142	0.0095	0.005988	0.1	3/2023	NA	11/2017
	Silver	mg/L	0.00111	0.000651	0.0005	0.1	9/2023	NA	11/2017
	Thallium	mg/L	0.00789	0.001	0.0005	0.002	3/2023	NA	11/2017
MW-23	Thallium	mg/L	0.0015	0.001	0.0005	0.002	9/2023	NA	11/2017
MW-36	Cadmium	mg/L	0.000656	0.000307	0.00004897	0.005	3/2023	NA	11/2017
	Cobalt	mg/L	0.00387	0.00138	0.0004985	0.003981	3/2023	NA	11/2017
	Lead	mg/L	0.00215	0.000765	0.000233	0.015	9/2023	NA	11/2017
	Nickel	mg/L	0.0183	0.0095	TS	0.1	3/2023	NA	11/2017
	Vanadium	mg/L	0.0101	0.003303	0.00124	0.035	9/2023	NA	11/2017

Notes:

1) Shaded rows denote constituent/well pairs with SSIs indicated in 2023 but not 2022. Unshaded rows denote constituent/well pairs with SSIs indicated during both the 2022 and 2023 reporting periods.
2) Ongoing SSI is defined as indicated SSIs for a monitoring well/constituent pair in both the 2022 and 2023 reporting periods.
3) A single exceedance in an assessment monitoring well is recorded above as an SSI. Retesting is not performed as these monitoring wells are not in the detection monitoring program.

* - J flag; concentration is below the reporting limit but above the MDL, the concentration is estimated.

NA - Not Applicable.

ISE - Insufficient sampling events to perform statistical analyses.

Comments:

1) **Problems with the current assessment network:** None.
2) **Proposed remedies:** None.
3) **Alternative constituent or sample frequency changes:** None.
4) **Plume delineation strategies:** See discussion of Figures 5 through 6 in report.
5) **Property owner notifications:** Not applicable.

Table 8
Summary Table of Ongoing and Newly Identified SSLs
2023 Annual Water Quality Report
Cass County Landfill
Permit No. 15-SDP-01-75P

Well	Constituent	Units	Most Recent Result	Upper Confidence Limit	GWPS	Initial Exceedance	Upper Confidence Limit Below GWPS					
							1st Year		2nd Year		3rd Year	
MW-11	Cobalt	mg/L	0.0113	0.0138	0.003981	3/2023	NA	NA	NA	NA	NA	NA

NA indicates that the constituent-monitoring point dataset has not satisfied the statistical requirements of IAC 567-113.10(9)"e"(2), which is identified by the entire confidence interval or confidence band, as appropriate, being below the GWPS.

Table 9
Summary of Groundwater Chemistry
2023 Annual Water Quality Report
Cass County Landfill
Permit No. 15-SDP-01-75P

The Summary of Groundwater Chemistry for the water table aquifer is located in Appendix C-1.
The Summary of Groundwater Chemistry for the water table source characterization is located in Appendix C-2.
The Summary of Groundwater Chemistry for the Dakota Sandstone aquifer is located in Appendix C-3.

Table 10
Historic SSI and SSL
2023 Annual Water Quality Report
Cass County Landfill
Permit No. 15-SDP-01-75P

Key

	SSI
	SSL

Well	Constituent	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019	Spring 2020	Fall 2020	Spring 2021	Fall 2021	Spring 2022	Fall 2022	Spring 2023	Fall 2023
Water Table														
MW-12***	Arsenic												NS	NS
MW-19	Barium													
	Cobalt*													
	1,1-Dichloroethane													
	Benzene													
	Chlorobenzene													
	Gamma-Chlordane													
	Nickel													
	Sulfide													
MW-20***	Arsenic													
	Barium													
MW-21	Acetone													
	Arsenic													
	Barium													
	Cobalt													
	Nickel													
	Toluene													
	Sulfide													
MW-24	Barium													
	Cadmium													
	Chlorobenzene													
	Cobalt													
	Nickel													
MW-37R	Barium											NS		
	Cobalt											NS		
	Lead											NS		
	Nickel											NS		
	Selenium											NS		
	Vanadium													
	Toluene													
	Xylenes													
MW-38R	Barium									NS				
	Cadmium									NS				
	Cobalt									NS				
	Lead													
	Nickel									NS				
	Selenium													
	Toluene									NS				
	Xylenes									NS				
MW-39	Selenium**													
	Thallium													
MW-43	Barium													
	Cobalt													
	Nickel													
	Selenium													
Dakota Sandstone														
MW-11	Arsenic													
	Barium													
	Cobalt													
	cis-1,2-Dichloroethene													
	Nickel													
	Silver													
	Thallium													
MW-23	Thallium													
MW-36	Cadmium													
	Cobalt													
	Lead													
	Nickel													
	Vanadium													

Comments:

1) Detections of organics and sulfide are considered SSIs for the purposes of this table.

* - Following the submittal of the Assessment of Corrective Measures Report (Doc #97998) which was approved in permit correspondence dated September 21, 2020 (Doc #98498), monitoring well MW-19 was moved to the Water Table monitoring network; therefore, the previous SSL for cobalt was no longer considered an SSL.

** - The current and historical SSL for selenium in monitoring well MW-39 was determined not to be caused by the Landfill and therefore selenium in monitoring well MW-39 is no longer considered an SSL.

*** - Beginning spring 2021 compliance at MW-12 and MW-20 were replaced with AZPOC wells MW-43 and MW-24, respectively. MW-12 and MW-20 are now source wells.

NS - Not Sampled due to equipment malfunction or the monitoring well being dry; therefore SSIs were unable to be determined.

Table 11
Corrective Action Trend Analysis
2023 Annual Water Quality Report
Cass County Landfill
Permit No. 15-SDP-01-75P

Well	Current SSL	Trend	Calculated S	Critical S	Total N	Projected Date to Completion
MW-11	Cobalt*	Increasing	10	21	8	NA

Notes:

N - Number of Samples

S - Mann-Kendall Statistic

NA - Not Applicable. Projected Date to Completion cannot be calculated for an increasing slope.

* - Pending further review of the measured cobalt SSL.

Comments:

1) An Assessment of Corrective Measures Report was submitted on June 30, 2020 (Doc #97998) and approved in permit correspondence dated September 21, 2020 (Doc #98498) for the Landfill. The Selection of Remedy and Corrective Action Groundwater Monitoring Program was submitted January 12, 2021 (Doc #99435) and approved in the Permit Correspondence dated March 4, 2021 (Doc #99924).

Figures

Monitoring Point	Monitoring Program
Water Table	
MW-15R	Background
MW-12	Source Well
MW-19	Assessment
MW-20	Source Well
MW-21	Assessment
MW-24	Corrective Action
MW-37R	Assessment
MW-38R	Assessment
MW-39	Assessment
MW-43	Corrective Action
UD-0	Detection
UD-1	Detection
Dakota Sandstone	
MW-22	Background
MW-11	Assessment
MW-23	Assessment
MW-36	Assessment

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Approved Monitoring Network

Legend

- Dakota Sandstone HMSP Monitoring Point
- Water Table HMSP Monitoring Point
- AZPOC Monitoring Point
- Groundwater Underdrain HMSP Point
- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

Figure 1

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Groundwater Contours - Water Table

Figure 2

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Legend

- Approximate Water Table Groundwater Contours Based on Field Measurments Taken September 13, 2023
- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
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Groundwater Contours - Dakota Sandstone

Figure 3

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Legend

- Approximate Dakota Sandstone Groundwater Contours Based on Field Measurements Taken September 13, 2023
- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

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MW-24	
Constituent (units)	Concentration
Barium (mg/L)	0.712 - 0.819 (2/2)
Cadmium (mg/L)	**0.000692 - 0.000776 (2/2)**
Cobalt (mg/L)	0.00283 - 0.00323 (2/2)
Nickel (mg/L)	0.0239 - 0.0301 (2/2)
Total Suspended Solids (mg/L)	45 (1/2)

MW-37R	
Constituent (units)	Concentration
Barium (mg/L)	0.693 - 0.863 (2/2)
Cadmium (mg/L)	0.000186 - 0.000205 (2/2)
Cobalt (mg/L)	0.00069 - 0.00121 (2/2)
Lead (mg/L)	**0.00135 - 0.00159 (2/2)**
Nickel (mg/L)	0.0127 (1/2)
Selenium (mg/L)	0.0201 - 0.0558 (2/2)
Total Suspended Solids (mg/L)	88.5 - 100 (2/2)

MW-23	
Constituent (units)	Concentration
Barium (mg/L)	0.146 - 0.157 (2/2)
Thallium (mg/L)	0.0015 (1/2)

MW-38R	
Constituent (units)	Concentration
Barium (mg/L)	0.212 - 0.261 (2/2)
Nickel (mg/L)	0.00569 (1/2)
Selenium (mg/L)	0.0264 - 0.0291 (2/2)
Total Suspended Solids (mg/L)	3.75 - 3.75 (2/2)

MW-19	
Constituent (units)	Concentration
Barium (mg/L)	1.24 - 1.29 (3/3)
Cobalt (mg/L)	0.0231 - 0.024 (3/3)
Nickel (mg/L)	0.0431 - 0.0627 (3/3)
Benzene (ug/L)	0.733 - 0.912 (3/3)
Chlorobenzene (ug/L)	1.49 - 1.89 (3/3)
Total Suspended Solids (mg/L)	3.75 - 5.25 (2/3)

MW-43	
Constituent (units)	Concentration
Arsenic (mg/L)	0.00242 (1/2)
Barium (mg/L)	0.202 - 0.348 (2/2)
Cadmium (mg/L)	0.00024 (1/2)
Cobalt (mg/L)	0.013 (1/2)
Nickel (mg/L)	0.0059 (1/2)
Selenium (mg/L)	0.0244 (1/3)
Total Suspended Solids (mg/L)	2.5 - 47.5 (3/3)

MW-36	
Constituent (units)	Concentration
Barium (mg/L)	0.125 - 0.135 (3/3)
Cadmium (mg/L)	**0.000194 - 0.0012 (3/3)**
Cobalt (mg/L)	0.00156 - 0.00387 (3/3)
Lead (mg/L)	**0.00215 (1/3)**
Nickel (mg/L)	0.00796 - 0.0183 (3/3)
Vanadium (mg/L)	**0.0101 (1/3)**
Total Suspended Solids (mg/L)	**4.13 - 468 (3/3)**

MW-20	
Constituent (units)	Concentration
Arsenic (mg/L)	**0.08 - 0.0813 (2/2)**
Barium (mg/L)	**3.32 - 3.8 (2/2)**
Cobalt (mg/L)	0.0131 - 0.0158 (2/2)
Nickel (mg/L)	0.0487 - 0.0787 (2/2)
1,4-Dichlorobenzene (ug/L)	**2.4 - 2.48 (2/2)**
Benzene (ug/L)	**2.93 - 3.14 (2/2)**
Chlorobenzene (ug/L)	**4.34 - 4.44 (2/2)**
Endosulfan I (ug/L)	**0.112 (1/2)**
Total Suspended Solids (mg/L)	**114 - 151 (2/2)**

MW-21	
Constituent (units)	Concentration
Barium (mg/L)	1.21 - 1.24 (2/2)
Cobalt (mg/L)	0.00468 - 0.00573 (2/2)
Nickel (mg/L)	0.00853 (1/2)
Total Suspended Solids (mg/L)	4.38 - 4.5 (2/2)

MW-11	
Constituent (units)	Concentration
Arsenic (mg/L)	**0.0135 - 0.0145 (2/2)**
Barium (mg/L)	**0.636 - 0.745 (2/2)**
Cadmium (mg/L)	0.000213 - 0.000259 (2/2)
Cobalt (mg/L)	**0.0113 - 0.0134 (2/2)**
Lead (mg/L)	0.000534 - 0.000589 (2/2)
Nickel (mg/L)	**0.0142 - 0.0188 (2/2)**
Silver (mg/L)	**0.00111 (1/2)**
Thallium (mg/L)	**0.00122 - 0.00789 (2/2)**
Total Suspended Solids (mg/L)	8.25 - 11.3 (2/2)

UD-0	
Constituent (units)	Concentration
Antimony (mg/L)	**0.00225 (1/2)**
Arsenic (mg/L)	0.00254 - 0.00344 (2/2)
Barium (mg/L)	0.877 - 0.94 (2/2)
Cadmium (mg/L)	0.000124 - 0.000305 (2/2)
Chromium (mg/L)	**0.00768 (1/2)**
Cobalt (mg/L)	**0.0089 - 0.0278 (2/2)**
Copper (mg/L)	**0.00655 - 0.0186 (2/2)**
Lead (mg/L)	0.00068 (1/2)
Nickel (mg/L)	**0.0768 - 0.128 (2/2)**
Total Suspended Solids (mg/L)	2.63 - 5.75 (2/2)

MW-39	
Constituent (units)	Concentration
Barium (mg/L)	0.0868 - 0.0949 (3/3)
Cadmium (mg/L)	0.000129 - 0.000319 (2/3)
Lead (mg/L)	0.000721 (1/3)
Selenium (mg/L)	**0.0719 - 0.0794 (3/3)**
Thallium (mg/L)	**0.00563 (1/3)**
Vanadium (mg/L)	**0.00643 (1/3)**

MW-15R	
Constituent (units)	Concentration
Barium (mg/L)	0.265 - 0.306 (2/2)
Total Suspended Solids (mg/L)	21.8 (1/2)

MW-22	
Constituent (units)	Concentration
Barium (mg/L)	0.232 - 0.251 (3/3)
Cadmium (mg/L)	0.000186 (1/3)
Nickel (mg/L)	0.0165 (1/3)

Maximum Concentrations - Water Table

Constituent	Monitoring Point	Maximum Concentration
Antimony (mg/L)	UD-0	0.00225
Arsenic (mg/L)	MW-20	0.0813
Barium (mg/L)	MW-20	3.8
Cadmium (mg/L)	MW-24	0.000776
Chromium (mg/L)	UD-0	0.00768
Cobalt (mg/L)	UD-0	0.0278
Copper (mg/L)	UD-0	0.0186
Lead (mg/L)	MW-37R	0.00159
Nickel (mg/L)	UD-0	0.128
Selenium (mg/L)	MW-39	0.0794
Thallium (mg/L)	MW-39	0.00563
Vanadium (mg/L)	MW-39	0.00643
Total Suspended Solids (mg/L)	MW-20	151
1,4-Dichlorobenzene (ug/L)	MW-20	2.48
Benzene (ug/L)	MW-20	3.14
Chlorobenzene (ug/L)	MW-20	4.44
Endosulfan I (ug/L)	MW-20	0.112

Maximum Concentrations - Dakota Sandstone

Constituent	Monitoring Point	Maximum Concentration
Arsenic (mg/L)	MW-11	0.0145
Barium (mg/L)	MW-11	0.745
Cadmium (mg/L)	MW-36	0.0012
Cobalt (mg/L)	MW-11	0.0134
Lead (mg/L)	MW-36	0.00215
Nickel (mg/L)	MW-11	0.0188
Silver (mg/L)	MW-11	0.00111
Thallium (mg/L)	MW-11	0.00789
Vanadium (mg/L)	MW-36	0.0101
Total Suspended Solids (mg/L)	MW-36	468

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Reporting Period Detection Summary

Figure 4

Legend

- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- Source Well
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

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0 255 510 1,020 Feet

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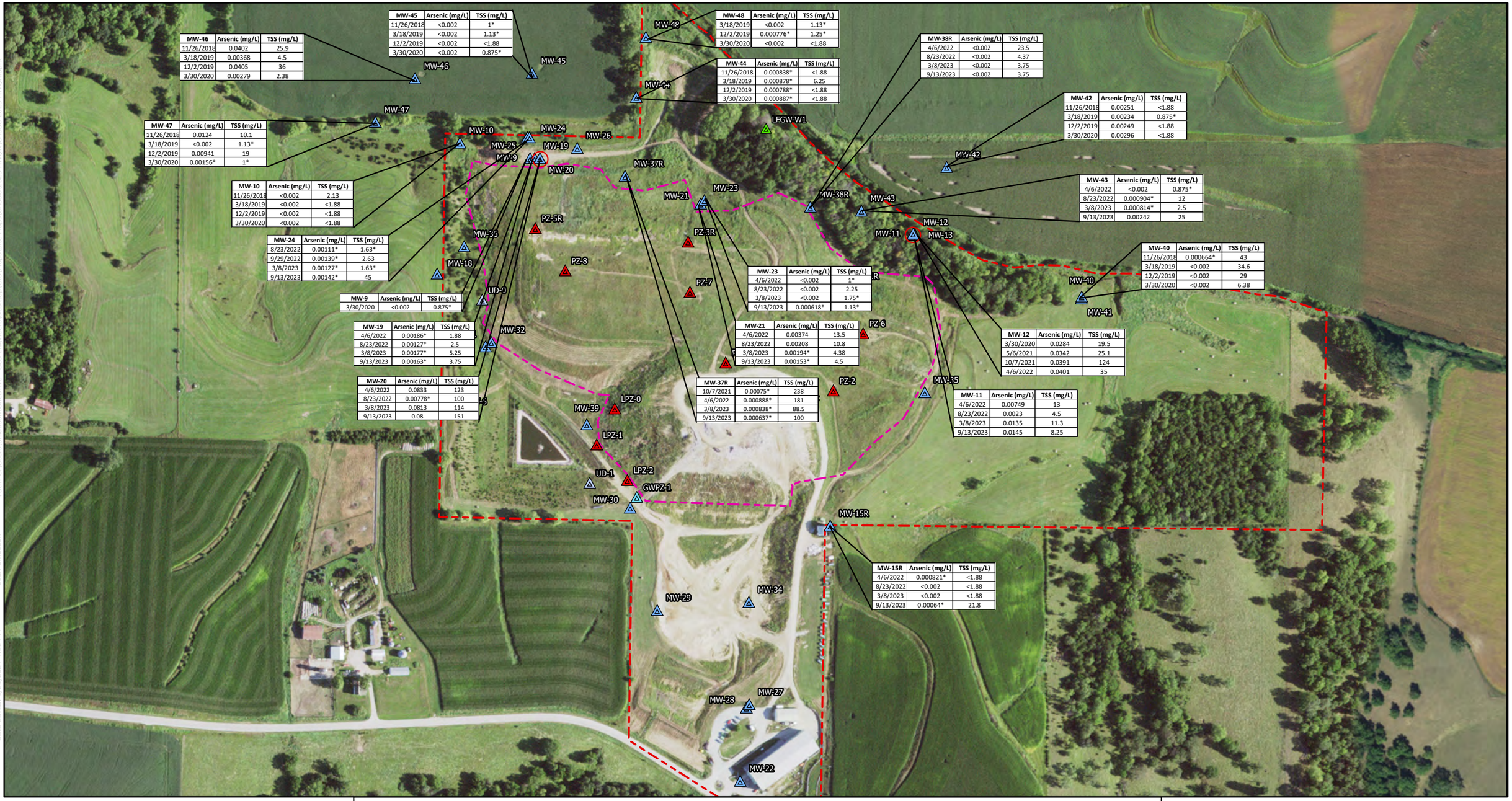

MW-46	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	0.0402	25.9
3/18/2019	0.00368	4.5
12/2/2019	0.0405	36
3/30/2020	0.00279	2.38

MW-45	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	<0.002	1*
3/18/2019	<0.002	1.13*
12/2/2019	<0.002	<1.88
3/30/2020	<0.002	0.875*

MW-48	Arsenic (mg/L)	TSS (mg/L)
3/18/2019	<0.002	1.13*
12/2/2019	0.000776*	1.25*
3/30/2020	<0.002	<1.88

MW-44	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	0.000838*	<1.88
3/18/2019	0.000878*	6.25
12/2/2019	0.000788*	<1.88
3/30/2020	0.000887*	<1.88

MW-38R	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	<0.002	23.5
8/23/2022	<0.002	4.37
3/8/2023	<0.002	3.75
9/13/2023	<0.002	3.75

MW-42	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	0.00251	<1.88
3/18/2019	0.00234	0.875*
12/2/2019	0.00249	<1.88
3/30/2020	0.00296	<1.88

MW-47	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	0.0124	10.1
3/18/2019	<0.002	1.13*
12/2/2019	0.00941	19
3/30/2020	0.00156*	1*

MW-10	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	<0.002	2.13
3/18/2019	<0.002	<1.88
12/2/2019	<0.002	<1.88
3/30/2020	<0.002	<1.88

MW-43	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	<0.002	0.875*
8/23/2022	0.000904*	12
3/8/2023	0.000814*	2.5
9/13/2023	0.00242	25

MW-24	Arsenic (mg/L)	TSS (mg/L)
8/23/2022	0.00111*	1.63*
9/29/2022	0.00139*	2.63
3/8/2023	0.00127*	1.63*
9/13/2023	0.00142*	45

MW-40	Arsenic (mg/L)	TSS (mg/L)
11/26/2018	0.000664*	43
3/18/2019	<0.002	34.6
12/2/2019	<0.002	29
3/30/2020	<0.002	6.38

MW-9	Arsenic (mg/L)	TSS (mg/L)
3/30/2020	<0.002	0.875*

MW-23	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	<0.002	1*
8/23/2022	<0.002	2.25
3/8/2023	<0.002	1.75*
9/13/2023	0.000618*	1.13*

MW-19	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	0.00186*	1.88
8/23/2022	0.00127*	2.5
3/8/2023	0.00177*	5.25
9/13/2023	0.00163*	3.75

MW-21	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	0.00374	13.5
8/23/2022	0.00208	10.8
3/8/2023	0.00194*	4.38
9/13/2023	0.00153*	4.5

MW-12	Arsenic (mg/L)	TSS (mg/L)
3/30/2020	0.0284	19.5
5/6/2021	0.0342	25.1
10/7/2021	0.0391	124
4/6/2022	0.0401	35

MW-20	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	0.0833	123
8/23/2022	0.00778*	100
3/8/2023	0.0813	114
9/13/2023	0.08	151

MW-37R	Arsenic (mg/L)	TSS (mg/L)
10/7/2021	0.00075*	238
4/6/2022	0.000888*	181
3/8/2023	0.000838*	88.5
9/13/2023	0.000637*	100

MW-11	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	0.00749	13
8/23/2022	0.0023	4.5
3/8/2023	0.0135	11.3
9/13/2023	0.0145	8.25

MW-15R	Arsenic (mg/L)	TSS (mg/L)
4/6/2022	0.000821*	<1.88
8/23/2022	<0.002	<1.88
3/8/2023	<0.002	<1.88
9/13/2023	0.00064*	21.8

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Arsenic Concentration Map

Figure 5

Legend

Arsenic Prediction Limit = 0.002941 mg/L

- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- SSL Well
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

* Indicates a J Flag - the concentration is below the reporting limit but above the method detection limit.

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

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MW-46	Barium (mg/L)	TSS (mg/L)
11/13/2017	0.189	15.3
6/6/2018	0.265	42.4
11/26/2018	0.24	25.9
3/30/2020	0.135	2.38

MW-45	Barium (mg/L)	TSS (mg/L)
11/13/2017	0.219	1.38*
6/6/2018	0.271	2.13
11/26/2018	0.236	1*
3/30/2020	0.231	0.875*

MW-48	Barium (mg/L)	TSS (mg/L)
11/26/2018	0.47	1.38*
3/30/2020	0.464	<1.88

MW-44	Barium (mg/L)	TSS (mg/L)
11/13/2017	0.476	<1.88
6/6/2018	0.516	0.75*
11/26/2018	0.519	<1.88
3/30/2020	0.48	<1.88

MW-47	Barium (mg/L)	TSS (mg/L)
11/13/2017	0.315	11.7
6/6/2018	0.298	5.38
11/26/2018	0.315	10.1
3/30/2020	0.207	1*

MW-37R	Barium (mg/L)	TSS (mg/L)
10/7/2021	0.911	238
4/6/2022	0.939	181
3/8/2023	0.863	88.5
9/13/2023	0.693	100

MW-10	Barium (mg/L)	TSS (mg/L)
11/13/2017	0.224	<1.88
6/6/2018	0.215	1*
11/26/2018	0.219	2.13
3/30/2020	0.233	<1.88

MW-23	Barium (mg/L)	TSS (mg/L)
4/6/2022	0.127	1*
8/23/2022	0.148	2.25
3/8/2023	0.157	1.75*
9/13/2023	0.146	1.13*

MW-24	Barium (mg/L)	TSS (mg/L)
8/23/2022	0.774	1.63*
9/29/2022	0.834	2.63
3/8/2023	0.819	1.63*
9/13/2023	0.712	45

MW-9	Barium (mg/L)	TSS (mg/L)
6/6/2018	0.241	157
11/26/2018	0.19	3.75
3/30/2020	0.145	0.875*

MW-26	Barium (mg/L)	TSS (mg/L)
11/13/2017	0.719	0.625*
6/6/2018	0.14	2.13
11/26/2018	0.596	0.875*
3/30/2020	0.539	<1.88

MW-38R	Barium (mg/L)	TSS (mg/L)
4/6/2022	0.31	23.5
8/23/2022	0.348	4.37
3/8/2023	0.261	3.75
9/13/2023	0.212	3.75

MW-19	Barium (mg/L)	TSS (mg/L)
4/6/2022	1.3	1.88
8/23/2022	1.11	2.5
3/8/2023	1.25	5.25
9/13/2023	1.24	3.75

MW-21	Barium (mg/L)	TSS (mg/L)
4/6/2022	1.05	13.5
8/23/2022	1.05	13.8
3/8/2023	1.21	4.38
9/13/2023	1.24	4.5

MW-20	Barium (mg/L)	TSS (mg/L)
4/6/2022	2.12	123
8/23/2022	2.47	100
3/8/2023	3.8	114
9/13/2023	3.32	151

MW-15R	Barium (mg/L)	TSS (mg/L)
4/6/2022	0.257	<1.88
8/23/2022	0.248	<1.88
3/8/2023	0.265	<1.88
9/13/2023	0.306	21.8

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environmental consultants and contractors

Barium Concentration Map

Figure 6

Legend

Barium Prediction Limit = 0.3136 mg/L

- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- SSL Well
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

* Indicates a J Flag - the concentration is below the reporting limit but above the method detection limit.

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

N
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0 255 510 1,020 Feet

Path: C:\Users\bmadson\OneDrive - SCS Engineers\Desktop\GIS\Maps\Site Maps\CASSCO 2023 AWOR\CASSCO 2023-AWOR.aprx
User: bmadson
Date Saved: 1/25/2024 4:30 PM

Esri, CGIAR, USGS, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

MW-11	Cobalt (mg/L)	TSS (mg/L)
4/6/2022	0.0107	13
8/23/2022	0.00619	4.5
3/8/2023	0.0134	11.3
9/13/2023	0.0113	8.25

MW-23	Cobalt (mg/L)	TSS (mg/L)
4/6/2022	<0.0005	1*
8/23/2022	<0.0005	2.25
3/8/2023	<0.0005	1.75*
9/13/2023	<0.0005	1.13*

MW-41	Cobalt (mg/L)	TSS (mg/L)
6/6/2018	0.00135	N/A
11/26/2018	0.000745	<1.88
3/18/2019	0.000896	<1.88
12/2/2019	0.000628	0.875*

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environmental consultants and contractors

Cobalt Concentration Map

Figure 7

Legend

Cobalt Prediction Limit = 0.003981 mg/L

- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- SSL Well
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

* Indicates a J Flag - the concentration is below the reporting limit but above the method detection limit.

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

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0 255 510 1,020 Feet

Esri, CGIAR, USGS, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

Path: C:\Users\bmadson\OneDrive - SCS Engineers\Desktop\GIS\Maps\Site Maps\CASSC 2023 AWOR\CASSC-2023-AWOR.aprx
User: bmadson
Date Saved: 12/29/2023 10:39 AM

Appendix A

Field Sampling Forms

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-15R**	Date:	**3/9/2023**
Gradient: Up		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	37.2
Initial Static Water Level (feet):	27.02
Initial Groundwater Elevation (ft-amsl):	118.44
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
12:19 PM	Purging start time.						
12:22 PM	8.5	4.1	867.4	6.78	162.1	1.8	
12:25 PM	9.0	3.9	877.2	6.78	161.8	1.8	
12:28 PM	9.1	3.8	878.9	6.79	162.4	1.8	
12:31 PM	9.3	3.7	880.7	6.77	162.5	2.5	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.7
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	141.67

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-12**	Date:	**3/8/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	20.0
Initial Static Water Level (feet):	NA
Initial Groundwater Elevation (ft-amsl):	NA
Equipment Used:	

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
	Purging start time.						
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Too little water, no sample collected.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-19**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	41.6
Initial Static Water Level (feet):	20.71
Initial Groundwater Elevation (ft-amsl):	27.89
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
5:38 PM	Purging start time.						
5:41 PM	9.0	0.7	2044.7	6.06	40.5		
5:44 PM	9.5	0.3	2032.9	6.04	43.0		
5:47 PM	9.6	0.2	2036.5	6.04	43.7		
5:50 PM	9.7	0.2	2032.5	6.03	44.2		
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	150.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Turbidity probe malfunctioned, no data collected.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-20**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	26.8
Initial Static Water Level (feet):	12.82
Initial Groundwater Elevation (ft-amsl):	35.39
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
4:49 PM	Purging start time.						
4:52 PM	9.4	0.4	3739.6	6.35	-73.3		
4:55 PM	9.5	0.2	3706.9	6.37	-78.2		
4:58 PM	9.4	0.1	3710.5	6.38	-82.1		
5:01 PM	9.4	0.1	3703.3	6.38	-85.1		
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.4
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	200.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Water had a yellow/brown tint. Well probably needs to be redeveloped to try and clear up water. Turbidity probe malfunction, no data collected.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-21**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	28.8
Initial Static Water Level (feet):	12.37
Initial Groundwater Elevation (ft-amsl):	56.91
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
2:20 PM	Purging start time.						
2:23 PM	9.4	0.5	1307.4	6.72	-6.2	2.4	
2:26 PM	9.5	0.2	1312.4	6.73	-7.1	2.9	
2:29 PM	9.5	0.1	1313.8	6.74	-9.2	2.4	
2:32 PM	9.4	0.1	1314.6	6.74	-9.9	2.4	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.6
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	216.67

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-24**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	31.7
Initial Static Water Level (feet):	16.98
Initial Groundwater Elevation (ft-amsl):	27.62
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
3:50 PM	Purging start time.						
3:53 PM	9.0	0.8	1430.9	6.08	116.2		
3:56 PM	9.2	0.3	1441.0	6.10	112.6		
3:59 PM	9.2	0.2	1443.0	6.11	110.8		
4:02 PM	9.2	0.2	1442.9	6.11	110.0		
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.3
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	191.67

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Turbidity probe malfunctioned, no data collected.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-37R**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	43.9
Initial Static Water Level (feet):	34.62
Initial Groundwater Elevation (ft-amsl):	28.49
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
3:00 PM	Purging start time.						
3:03 PM	9.5	7.3	964.9	6.36	89.2		
3:06 PM	10.2	7.2	961.8	6.34	97.2		
3:09 PM	11.2	7.2	957.4	6.35	105.3		
3:12 PM	11.3	7.1	953.7	6.34	112.7		
3:15 PM	11.2	6.9	957.6	6.33	119.5		
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	3.4
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	283.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Turbidity probe malfunctioned, no data collected. Cut down casing by 0.20' after sampling was completed, adjust TOC for next sampling event.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-38R**	Date:	**3/10/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	50.2
Initial Static Water Level (feet):	46.62
Initial Groundwater Elevation (ft-amsl):	27.57
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
10:34 AM	Purging start time.						
10:37 AM	9.0	3.1	1071.0	6.80	113.1	32.3	
10:40 AM	8.9	2.4	1036.0	6.80	108.7	30.1	
10:43 AM	10.8	2.3	1011.1	6.79	100.3	19.6	
10:46 AM	10.6	2.1	1041.0	6.79	95.9	14.7	
10:49 AM	10.4	2.0	1046.1	6.79	94.9	12.0	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.9
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	15:00
Average Purge Rate (mL/min):	193.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	Yes	Pump problems
If yes, explain:		

Additional Comments:	Water level dropped below pump. Had to pull dedicated pump and sample with portable pump. Dedicated pump will need power cable extended so pump can sit at 49.5' from TOC.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-39**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	32.4
Initial Static Water Level (feet):	17.53
Initial Groundwater Elevation (ft-amsl):	94.34
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
11:07 AM	Purging start time.						
11:10 AM	9.5	7.5	705.8	7.38	136.4	4.1	
11:13 AM	9.7	7.1	702.2	7.31	142.6	3.6	
11:16 AM	9.8	7.1	701.1	7.31	145.8	1.5	
11:19 AM	9.9	7.0	700.1	7.30	147.4	1.6	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.1
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	175.00

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-43**	Date:	**3/8/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	23.8
Initial Static Water Level (feet):	18.73
Initial Groundwater Elevation (ft-amsl):	22.68
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
3:04 PM	Purging start time.						
3:07 PM	9.0	1.3	1013.9	6.62	59.3		
3:10 PM	8.7	0.9	1012.3	6.61	68.1		
3:13 PM	8.8	0.7	1010.3	6.61	73.8		
3:16 PM	8.9	0.7	1008.7	6.61	78.6		
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.1
Was well pumped/bailed dry?	Yes
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	170.83

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Turbidity probe malfunctioned, no data collected. Well went dry while filling bottles, let well recharge came back and finished filling TSS bottle later.

FORM FOR SURFACE WATER SAMPLING

Site Name: Cass County Sanitary Landfill
Permit No.: 15-SDP-01-75P
Surface Monitoring Point No.: UD-0
Date: 3/10/23

Name of Person Sampling: Konner Roth

A. TYPE OF MOINITORING POINT

Stream		Open Tile	
Road Ditch		Tile with Riser	
Drainage Ditch		Other	

B. PURPOSE OF MONITORING POINT

Upstream		Downstream	
Within Landfill		Other	

C. MONITORING POINT CONDITIONS/LOCATION

Was monitoring point dry?	No	Too little water to sample?	No
Was water flowing?	Yes	If yes, estimate quantity (cfs)	~150 mL/min
Standing Water?	No	If yes, estimate depth (inches)	—
		If yes, estimate width (inches)	—
Was water discolored?	Slight yellow tint		
Does water have odor?	None		
Was ground discolored?	No		
Litter present?	No		

D. FIELD MEASUREMENTS

Weather Conditions: 29°F overcast

Time: 9:20

Field Measurements:

Temperature	0.2	Units	Celsius
Equipment Used	Hanna stick		
pH	7.08	Units	Standard units
Equipment Used	Hanna stick		
Spec.Conductance	3476	Units	uS/cm
Equipment Used	Hanna stick		

COMMENTS

IDNR Form 542-1324

FORM FOR SURFACE WATER SAMPLING

Site Name: Cass County Sanitary Landfill
Permit No.: 15-SDP-01-75P
Surface Monitoring Point No.: UD-1
Date: 3/11/23

Name of Person Sampling: Konnor Roth

A. TYPE OF MOINITORING POINT

Stream		Open Tile	
Road Ditch		Tile with Riser	
Drainage Ditch		Other	

B. PURPOSE OF MONITORING POINT

Upstream		Downstream	
Within Landfill		Other	

C. MONITORING POINT CONDITIONS/LOCATION

Was monitoring point dry?	Yes	Too little water to sample?	Yes
Was water flowing?	NO	If yes, estimate quantity (cfs)	
Standing Water?	NO	If yes, estimate depth (inches)	
		If yes, estimate width (inches)	
Was water discolored?			
Does water have odor?			
Was ground discolored?			
Litter present?			

D. FIELD MEASUREMENTS

Weather Conditions:

Time:

Field Measurements:

Temperature		Units	Celsius
Equipment Used			
pH		Units	Standard units
Equipment Used			
Spec.Conductance		Units	uS/cm
Equipment Used			

COMMENTS

No sample collected

IDNR Form 542-1324

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-22**	Date:	**3/9/2023**
Gradient: Up		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	NM
Initial Static Water Level (feet):	63.23
Initial Groundwater Elevation (ft-amsl):	30.07
Equipment Used:	Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
11:41 AM	Purging start time.						
11:44 AM	9.0	5.8	306.8	6.86	135.6	1.8	
11:47 AM	10.0	5.8	296.4	6.83	134.4	1.7	
11:50 AM	10.6	5.6	297.5	6.82	138.7	1.6	
11:53 AM	10.4	5.2	297.1	6.81	141.4	1.5	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.5
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	208.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-11**	Date:	**3/8/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	46.0
Initial Static Water Level (feet):	19.02
Initial Groundwater Elevation (ft-amsl):	25.60
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
2:31 PM	Purging start time.						
2:34 PM	8.5	1.0	1198.3	6.64	3.1	1.6	
2:37 PM	8.6	0.4	1225.2	6.65	-7.8	1.6	
2:40 PM	8.8	0.3	1226.5	6.66	-15.6	1.6	
2:43 PM	8.9	0.2	1218.9	6.67	-21.9	1.6	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	150.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-23**	Date:	**3/9/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	NM
Initial Static Water Level (feet):	40.88
Initial Groundwater Elevation (ft-amsl):	28.13
Equipment Used:	Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
1:57 PM	Purging start time.						
2:00 PM	8.9	1.5	609.9	6.93	31.7	7.6	
2:03 PM	8.8	0.9	605.4	6.92	19.3	11.7	
2:06 PM	9.7	0.8	604.0	6.92	9.7	5.9	
2:09 PM	10.4	0.7	603.5	6.91	4.2	4.7	
2:12 PM	10.8	0.6	604.1	6.91	1.5	3.9	
2:15 PM	10.8	0.6	604.1	6.91	-1.8	3.4	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	3.2
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	18:00
Average Purge Rate (mL/min):	177.78

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Water had an odor.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill**		
Monitoring Well/Piezometer ID:	**MW-36**	Date:	**3/10/2023**
Gradient: Down		Sampler:	Chad Dentlinger

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	57.6
Initial Static Water Level (feet):	44.30
Initial Groundwater Elevation (ft-amsl):	28.13
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
8:55 AM	Purging start time.						
8:58 AM	6.6	1.7	1130.1	6.29	111.9	127.6	
9:01 AM	8.7	1.2	1134.0	6.28	103.0	115.5	
9:04 AM	9.0	1.2	1133.3	6.30	97.7	63.7	
9:07 AM	7.7	1.3	1134.7	6.31	96.3	40.6	
9:10 AM	6.8	1.3	1136.2	6.32	95.7	32.8	
9:13 AM	10.1	1.3	1121.5	6.31	94.7	24.0	
9:16 AM	10.8	1.3	1127.4	6.31	94.4	10.5	
9:19 AM	10.8	1.3	1127.3	6.31	95.3	7.6	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	3.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	24:00
Average Purge Rate (mL/min):	158.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	Pump problems
If yes, explain:		

Additional Comments:	Purged for 10 minutes before starting parameter stabilization to try to clear up water from lowering pump.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-43**	Date:	**7/21/2023**
Gradient: Down		Sampler:	Scott Stoller

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	23.8
Initial Static Water Level (feet):	19.04
Initial Groundwater Elevation (ft-amsl):	22.37
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
12:35 PM	Purging start time.						
12:38 PM	14.8	2.3	1324.7	6.76	140.2	6.8	
12:41 PM	14.7	1.2	1334.3	6.70	123.0	6.1	
12:44 PM	14.8	0.9	1326.7	6.66	118.1	6.0	
12:47 PM	14.4	0.7	1335.6	6.69	117.6	6.2	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	150.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-15R**	Date:	**9/13/2023**
Gradient: Up		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	37.2
Initial Static Water Level (feet):	27.90
Initial Groundwater Elevation (ft-amsl):	117.56
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
6:18 PM	Purging start time.						
6:21 PM	15.1	4.2	940.0	7.23	25.9	6.9	
6:24 PM	14.5	3.6	936.1	7.14	30.8	7.0	
6:27 PM	14.6	3.4	932.5	7.07	34.4	6.9	
6:30 PM	14.8	3.2	936.5	7.03	37.4	6.2	
6:33 PM	15.5	3.0	929.9	6.97	40.1	7.4	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.7
Was well pumped/bailed dry?	Yes
Total Amount of Time Purged (minutes:seconds):	15:00
Average Purge Rate (mL/min):	113.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	Well went dry while collecting samples. Let recharge then finished collecting samples.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-12**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS		
Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)	
Measured Well Total Depth (feet):	19.9
Initial Static Water Level (feet):	Dry
Initial Groundwater Elevation (ft-amsl):	NA
Equipment Used:	NA

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
	Purging start time.						
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	0.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	
Average Purge Rate (mL/min):	0.00

D. WELL MAINTENANCE		
Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Well was dry.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-19**	Date:	**9/14/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	41.6
Initial Static Water Level (feet):	21.62
Initial Groundwater Elevation (ft-amsl):	26.98
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
11:30 AM	Purging start time.						
11:33 AM	16.1	2.3	2114.3	6.09	23.8	4.4	
11:36 AM	16.2	1.3	2123.9	6.09	14.1	4.3	
11:39 AM	16.3	1.0	2126.1	6.10	9.6	3.7	
11:42 AM	16.7	0.9	2127.6	6.07	7.1	3.9	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.3
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	108.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-20**	Date:	**9/14/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	26.7
Initial Static Water Level (feet):	16.60
Initial Groundwater Elevation (ft-amsl):	31.61
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
1:18 PM	Purging start time.						
1:21 PM	15.6	1.9	3675.7	7.07	-133.3	24.7	
1:24 PM	15.3	1.2	3642.1	6.83	-134.7	24.3	
1:27 PM	15.5	0.9	3626.1	6.72	-136.6	30.1	
1:30 PM	15.6	0.8	3612.0	6.68	-137.9	28.0	
1:33 PM	15.5	0.7	3581.6	6.69	-138.1	28.7	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.1
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	15:00
Average Purge Rate (mL/min):	140.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-21**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	28.7
Initial Static Water Level (feet):	13.23
Initial Groundwater Elevation (ft-amsl):	56.05
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
1:42 PM	Purging start time.						
1:45 PM	14.4	2.1	1400.0	7.33	-50.9	8.9	
1:48 PM	14.4	1.2	1401.4	7.13	-67.1	3.4	
1:51 PM	14.5	1.0	1404.9	7.06	-73.8	3.6	
1:54 PM	14.9	0.8	1401.6	7.00	-78.6	4.6	
1:57 PM	14.8	0.7	1405.8	7.00	-83.6	6.5	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	3.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	15:00
Average Purge Rate (mL/min):	200.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-24**	Date:	**9/13/2023**
Gradient: Supplemental		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	31.7
Initial Static Water Level (feet):	18.02
Initial Groundwater Elevation (ft-amsl):	26.58
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
12:00 PM	Purging start time.						
12:03 PM	14.4	2.0	1459.0	6.92	78.3	5.3	
12:06 PM	14.0	1.2	1454.7	6.65	29.1	4.5	
12:09 PM	13.8	0.9	1455.3	6.58	21.6	5.1	
12:12 PM	13.9	0.8	1455.4	6.54	18.5	4.6	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.2
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	183.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-37R**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	42.6
Initial Static Water Level (feet):	36.13
Initial Groundwater Elevation (ft-amsl):	26.98
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
12:42 PM	Purging start time.						
12:45 PM	13.9	6.4	970.1	7.01	127.6	146.8	
12:48 PM	13.8	6.1	958.7	6.76	123.1	193.4	
12:51 PM	14.8	6.0	962.5	6.61	122.7	170.4	
12:54 PM	15.1	6.7	966.6	6.57	124.3	116.1	
12:57 PM	18.2	7.1	967.5	6.32	123.2	89.4	
1:00 PM	18.6	7.4	968.2	6.31	126.6	61.2	
1:03 PM	19.2	7.3	963.1	6.26	130.3	42.5	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	5.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	21:00
Average Purge Rate (mL/min):	276.19

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-38R**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	50.3
Initial Static Water Level (feet):	47.37
Initial Groundwater Elevation (ft-amsl):	26.82
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
3:18 PM	Purging start time.						
3:21 PM	13.9	5.7	1151.0	7.62	40.8	167.2	
3:24 PM	13.8	4.5	1081.4	7.40	39.7	59.6	
3:27 PM	13.7	3.7	1069.6	7.30	40.5	23.4	
3:30 PM	13.7	3.2	1057.2	7.25	40.9	13.7	
3:33 PM	13.9	3.0	1048.7	7.21	40.9	11.2	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	6.5
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	15:00
Average Purge Rate (mL/min):	433.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	Could not purge slower without failure.

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-39**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	32.4
Initial Static Water Level (feet):	16.76
Initial Groundwater Elevation (ft-amsl):	95.11
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
9:13 AM	Purging start time.						
9:16 AM	13.9	5.5	727.9	6.95	197.0	15.4	
9:19 AM	13.9	4.1	739.9	7.01	185.4	33.4	
9:22 AM	13.8	3.7	741.8	7.05	175.3	39.4	
9:25 AM	14.0	3.5	739.9	7.09	166.1	37.6	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.8
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	150.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	
Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Water Table Aquifer**		
Monitoring Well/Piezometer ID:	**MW-43**	Date:	**9/13/2023**
Gradient: Supplemental		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	23.7
Initial Static Water Level (feet):	19.42
Initial Groundwater Elevation (ft-amsl):	21.99
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
4:17 PM	Purging start time.						
4:20 PM	13.6	3.1	1641.4	7.14	-96.1	3.8	
4:23 PM	13.5	1.7	1599.0	7.07	-92.4	3.7	
4:26 PM	13.4	1.2	1548.8	7.03	-82.5	4.1	
4:29 PM	13.4	1.0	1531.3	7.03	-74.2	4.1	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	1.7
Was well pumped/bailed dry?	Yes
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	141.67

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	Well went dry while collecting samples. Waited for recharge and finished collecting sample.

FORM FOR SURFACE WATER SAMPLING

Site Name: Cass County Sanitary Landfill
Permit No.: 15-SDP-01-75P
Surface Monitoring Point No.: UD-0
Date: 9/13/2023

Name of Person Sampling: Caleb Gomez

A. TYPE OF MOINITORING POINT

Stream
Road Ditch
Drainage Ditch
Open Tile
Tile with Riser
Other

B. PURPOSE OF MONITORING POINT

Upstream
Within Landfill
Downstream
Other

C. MONITORING POINT CONDITIONS/LOCATION

Was monitoring point dry? NO
Was water flowing? YES
Standing Water? No
Was water discolored? Yes
Does water have odor? NO
Was ground discolored? NO
Litter present? NO

Too little water to sample? NO
If yes, estimate quantity (cfs)
If yes, estimate depth (inches)
If yes, estimate width (inches)

D. FIELD MEASUREMENTS

Weather Conditions: Sunny
Time: 10:00
Field Measurements:

Temperature: 16.2 Units: Celsius
Equipment Used:

pH: 6.93 Units: Standard units
Equipment Used:

Spec.Conductance: 3999 Units: uS/cm
Equipment Used:

COMMENTS

IDNR Form 542-1324

FORM FOR SURFACE WATER SAMPLING

Site Name: Cass County Sanitary Landfill
Permit No.: 15-SDP-01-75P
Surface Monitoring Point No.: UD-1
Date: 9-13-2023

Name of Person Sampling: CALEB GOMEZ

A. TYPE OF MOINITORING POINT

Stream		Open Tile	
Road Ditch		Tile with Riser	
Drainage Ditch		Other	

B. PURPOSE OF MONITORING POINT

Upstream		Downstream	
Within Landfill		Other	

C. MONITORING POINT CONDITIONS/LOCATION

Was monitoring point dry? YES
Was water flowing? NO
Standing Water? NO

Too little water to sample? YES
If yes, estimate quantity (cfs)
If yes, estimate depth (inches)
If yes, estimate width (inches)

Was water discolored?
Does water have odor?
Was ground discolored?
Litter present?

D. FIELD MEASUREMENTS

Weather Conditions:

Time:

Field Measurements:

Temperature		Units	Celsius
Equipment Used			
pH		Units	Standard units
Equipment Used			
Spec.Conductance		Units	uS/cm
Equipment Used			

COMMENTS

NO SAMPLE COLLECTED

IDNR Form 542-1324

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Dakota Sandstone Aquifer**		
Monitoring Well/Piezometer ID:	**MW-22**	Date:	**9/14/2023**
Gradient: Up		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	NM
Initial Static Water Level (feet):	64.19
Initial Groundwater Elevation (ft-amsl):	29.11
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
9:55 AM	Purging start time.						
9:58 AM	12.6	4.5	307.1	7.28	111.3	8.0	
10:01 AM	12.8	5.2	306.9	7.18	106.5	6.8	
10:04 AM	13.0	6.1	307.8	7.11	108.7	5.6	
10:07 AM	13.1	6.5	308.1	7.09	112.0	5.7	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	6.4
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	533.33

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Dakota Sandstone Aquifer**		
Monitoring Well/Piezometer ID:	**MW-11**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	45.8
Initial Static Water Level (feet):	19.68
Initial Groundwater Elevation (ft-amsl):	24.94
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
5:31 PM	Purging start time.						
5:34 PM	13.6	3.6	1227.8	7.44	-94.3	5.0	
5:37 PM	13.1	1.8	1213.7	7.34	-104.6	5.0	
5:40 PM	13.1	1.3	1203.9	7.30	-107.6	5.5	
5:43 PM	13.0	1.0	1193.3	7.28	-109.7	6.2	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	2.1
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	12:00
Average Purge Rate (mL/min):	175.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Dakota Sandstone Aquifer**		
Monitoring Well/Piezometer ID:	**MW-23**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes
Litter/Standing Water?	No

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	NM
Initial Static Water Level (feet):	41.67
Initial Groundwater Elevation (ft-amsl):	27.34
Equipment Used:	Dedicated Tubing – Peristaltic Pump

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
2:25 PM	Purging start time.						
2:28 PM	15.2	2.5	648.2	7.63	-152.4	6.6	
2:31 PM	15.0	1.7	632.3	7.46	-143.6	5.0	
2:34 PM	15.3	1.5	632.8	7.31	-130.4	4.4	
2:37 PM	15.8	1.3	633.3	7.20	-119.6	4.7	
2:40 PM	16.0	1.3	632.3	7.15	-110.6	4.4	
2:43 PM	16.7	1.2	634.8	7.06	-103.4	5.6	
2:46 PM	15.8	1.2	633.4	7.11	-96.6	6.2	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	3.1
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	21:00
Average Purge Rate (mL/min):	147.62

D. WELL MAINTENANCE

Does the well require any future maintenance?	No
If yes, explain:	

Additional Comments:	

FORM FOR GROUNDWATER SAMPLING

Project:	**Cass County Sanitary Landfill - Dakota Sandstone Aquifer**		
Monitoring Well/Piezometer ID:	**MW-36**	Date:	**9/13/2023**
Gradient: Down		Sampler:	Caleb Gomez

A. MW/PIEZOMETER CONDITIONS

Well/Piezometer Capped?	Yes	
Litter/Standing Water?	No	

B. GROUNDWATER ELEVATION MEASUREMENT (+/- 0.01 foot, MSL)

Measured Well Total Depth (feet):	62.5
Initial Static Water Level (feet):	43.93
Initial Groundwater Elevation (ft-amsl):	28.50
Equipment Used:	Non-Dedicated Submersible

C. WELL PURGING

FIELD PARAMETERS [stabilization criteria] RECORD EVERY 3 MINUTES

Time	**Temperature (°C) 10%**	Dissolved Oxygen (mg/L)	**Specific Conductivity (µS/cm) +/- 10%**	**pH (S.U.) +/- 0.1**	ORP (mV)	Turbidity (FNU)	
10:36 AM	Purging start time.						
10:39 AM	13.4	3.1	1182.5	7.06	131.4	55.6	
10:42 AM	13.2	2.2	1178.7	6.83	128.0	136.3	
10:45 AM	13.7	2.0	1174.8	6.71	124.4	214.0	
10:48 AM	13.4	1.9	1169.9	6.70	122.5	274.1	
10:51 AM	13.7	1.8	1169.5	6.66	121.4	364.1	
	Parameters stabilized, sample collected.						

Quantity of Water Removed from Well (liters):	6.0
Was well pumped/bailed dry?	No
Total Amount of Time Purged (minutes:seconds):	15:00
Average Purge Rate (mL/min):	400.00

D. WELL MAINTENANCE

Does the well require any future maintenance?	No	
If yes, explain:		

Additional Comments:	Purged prior to sampling until clear. Became a little murky brown before collecting samples.

Appendix B-1

Laboratory Analytical Data Sheets

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Ben Madson
SCS Engineers
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

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JOB DESCRIPTION

Cass County Sanitary Landfill(Spring 2023 WT HMSP)
SDG NUMBER 27223098 Task1

JOB NUMBER

310-251194-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

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Authorization

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Authorized for release by
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Job ID: 310-251194-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-251194-1

Receipt
The samples were received on 3/10/2023 4:15 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were -0.3°C, 0.8°C and 2.1°C

SUBCONTRACTING
The following analysis was subcontracted to Keystone Laboratories, Inc:
General Subcontract Method

GC/MS VOA
Method 8260D: The following sample(s) was collected in a properly preserved vial; however, the pH was outside the required criteria when verified by the laboratory. The sample was analyzed within the 7-day holding time specified for unpreserved samples: MW-20 (310-251194-3).
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-381115.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.
Method 8270E: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 310-381115 and analytical batch 310-381339 recovered outside control limits for the following analytes: 4-Chloroaniline.
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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

PCBs
Method 8082A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-381117.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Pesticides
Method 8081B: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-381117.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
Method 6020B: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-20 (310-251194-3). The sample(s) was preserved to the appropriate pH in the laboratory.
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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

Subcontract Lab non-Sister Lab
See attached subcontract report.

Sample Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-251194-1	MW-15R	Ground Water	03/09/23 12:31	03/10/23 16:15
310-251194-2	MW-19	Ground Water	03/09/23 17:50	03/10/23 16:15
310-251194-3	MW-20	Ground Water	03/09/23 17:01	03/10/23 16:15
310-251194-4	MW-21	Ground Water	03/09/23 14:32	03/10/23 16:15
310-251194-5	MW-24	Ground Water	03/09/23 16:02	03/10/23 16:15
310-251194-6	MW-37R	Ground Water	03/09/23 15:15	03/10/23 16:15
310-251194-7	MW-38R	Ground Water	03/10/23 10:49	03/10/23 16:15
310-251194-8	MW-39	Ground Water	03/09/23 11:19	03/10/23 16:15
310-251194-9	MW-43	Ground Water	03/08/23 15:16	03/10/23 16:15
310-251194-10	UD-0	Ground Water	03/10/23 09:20	03/10/23 16:15
310-251194-11	MW-DWT	Ground Water	03/09/23 17:50	03/10/23 16:15
310-251194-12	Trip Blank 1	Water	03/08/23 00:00	03/10/23 16:15
310-251194-13	Trip Blank 2	Water	03/08/23 00:00	03/10/23 16:15

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-15R — Lab Sample ID: 310-251194-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.265		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cobalt	0.000308	J	0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.00233	J	0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00155	J	0.00500	0.000960	mg/L	1		6020B	Total/NA

Client Sample ID: MW-19 — Lab Sample ID: 310-251194-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.912		0.500	0.220	ug/L	1		8260D	Total/NA
Chlorobenzene	1.86		1.00	0.400	ug/L	1		8260D	Total/NA
Chloroethane	1.19	J	4.00	0.790	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.426	J	1.00	0.210	ug/L	1		8260D	Total/NA
1,4-Dichlorobenzene	0.366	J	1.00	0.230	ug/L	1		8260D	Total/NA
1,1-Dichloroethane	0.589	J	1.00	0.220	ug/L	1		8260D	Total/NA
Arsenic	0.00177	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	1.25		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cobalt	0.0231		0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.0606		0.00500	0.00190	mg/L	1		6020B	Total/NA
Total Suspended Solids	1.63	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-20 — Lab Sample ID: 310-251194-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	6.42	J	10.0	3.10	ug/L	1		8260D	Total/NA
Benzene	3.14		0.500	0.220	ug/L	1		8260D	Total/NA
Chlorobenzene	4.44		1.00	0.400	ug/L	1		8260D	Total/NA
Chloroethane	1.00	J	4.00	0.790	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.327	J	1.00	0.210	ug/L	1		8260D	Total/NA
1,4-Dichlorobenzene	2.40		1.00	0.230	ug/L	1		8260D	Total/NA
Ethylbenzene	0.332	J	1.00	0.310	ug/L	1		8260D	Total/NA
Toluene	0.701	J	1.00	0.430	ug/L	1		8260D	Total/NA
Xylenes, Total	0.551	J	3.00	0.400	ug/L	1		8260D	Total/NA
Endosulfan I	0.112		0.0627	0.0324	ug/L	1		8081B	Total/NA
Arsenic	0.0813		0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	3.80		0.00800	0.00352	mg/L	4		6020B	Total/NA
Cadmium	0.0000590	J	0.000100	0.0000550	mg/L	1		6020B	Total/NA
Chromium	0.00168	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.0158		0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.0787		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00108	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Vanadium	0.00379	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	114		15.0	5.10	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-21 — Lab Sample ID: 310-251194-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.233	J	1.00	0.210	ug/L	1		8260D	Total/NA
Arsenic	0.00194	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	1.21		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cobalt	0.00573		0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.00853		0.00500	0.00190	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-21 (Continued) — Lab Sample ID: 310-251194-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	4.38		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-24 — Lab Sample ID: 310-251194-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	0.911	J	1.00	0.400	ug/L	1		8260D	Total/NA
1,1-Dichloroethane	0.394	J	1.00	0.220	ug/L	1		8260D	Total/NA
2-Methylnaphthalene	0.698	J	10.0	0.590	ug/L	1		8270E	Total/NA
Arsenic	0.00127	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	0.819		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.000692		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Cobalt	0.00283		0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.0301		0.00500	0.00190	mg/L	1		6020B	Total/NA
Total Suspended Solids	1.63	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-37R — Lab Sample ID: 310-251194-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00153	J	0.00200	0.000690	mg/L	1		6020B	Total/NA
Arsenic	0.000838	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	0.863		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.000186		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Cobalt	0.000690		0.000500	0.000190	mg/L	1		6020B	Total/NA
Lead	0.00159		0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.00366	J	0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.0201		0.00500	0.000960	mg/L	1		6020B	Total/NA
Vanadium	0.00272	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	88.5		7.50	2.55	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-38R — Lab Sample ID: 310-251194-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.261		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.0000780	J	0.000100	0.0000550	mg/L	1		6020B	Total/NA
Chromium	0.00457	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.000323	J	0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.00569		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.0291		0.00500	0.000960	mg/L	1		6020B	Total/NA
Total Suspended Solids	3.75		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-39 — Lab Sample ID: 310-251194-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0949		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.000129		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Chromium	0.00215	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Selenium	0.0794		0.00500	0.000960	mg/L	1		6020B	Total/NA
Total Suspended Solids	0.875	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-43 — Lab Sample ID: 310-251194-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.000814	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	0.202		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.0000650	J	0.000100	0.0000550	mg/L	1		6020B	Total/NA
Cobalt	0.000369	J	0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.00291	J	0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.0244		0.00500	0.000960	mg/L	1		6020B	Total/NA
Vanadium	0.00178	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	2.50		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: UD-0 — Lab Sample ID: 310-251194-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00254		0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	0.877		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.000124		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Chromium	0.00278	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.00890		0.000500	0.000190	mg/L	1		6020B	Total/NA
Copper	0.00655		0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000358	J	0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.0768		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00145	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Vanadium	0.00300	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	2.63		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-DWT — Lab Sample ID: 310-251194-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.912		0.500	0.220	ug/L	1		8260D	Total/NA
Chlorobenzene	1.89		1.00	0.400	ug/L	1		8260D	Total/NA
Chloroethane	0.877	J	4.00	0.790	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.480	J	1.00	0.210	ug/L	1		8260D	Total/NA
1,4-Dichlorobenzene	0.365	J	1.00	0.230	ug/L	1		8260D	Total/NA
1,1-Dichloroethane	0.630	J	1.00	0.220	ug/L	1		8260D	Total/NA
Arsenic	0.00183	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	1.29		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cobalt	0.0240		0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.0627		0.00500	0.00190	mg/L	1		6020B	Total/NA
Total Suspended Solids	5.25		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: Trip Blank 1 — Lab Sample ID: 310-251194-12

No Detections.

Client Sample ID: Trip Blank 2 — Lab Sample ID: 310-251194-13

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-15R

Date Collected: 03/09/23 12:31
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-1

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 13:55	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 13:55	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 13:55	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 13:55	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 13:55	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 13:55	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 13:55	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 13:55	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 13:55	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 13:55	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 13:55	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 13:55	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 13:55	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 13:55	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 13:55	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 13:55	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 13:55	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 13:55	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 13:55	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 13:55	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 13:55	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 13:55	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 13:55	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 13:55	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 13:55	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 13:55	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 13:55	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 13:55	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 13:55	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 13:55	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 13:55	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 13:55	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 13:55	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 13:55	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 13:55	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 13:55	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 13:55	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 13:55	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 13:55	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 13:55	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 13:55	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 13:55	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 13:55	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 13:55	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 13:55	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 13:55	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 13:55	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-15R

Date Collected: 03/09/23 12:31
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-1

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*03/13/23 13:55*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 128*		*03/13/23 13:55*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 13:55*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 20:28	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 20:28	1
Barium	**0.265**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 20:28	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 20:28	1
Cadmium	<0.000100		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 20:28	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:28	1
Cobalt	**0.000308**	**J**	0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 20:28	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 20:28	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 20:28	1
Nickel	**0.00233**	**J**	0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 20:28	1
Selenium	**0.00155**	**J**	0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 20:28	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 20:28	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 20:28	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:28	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 20:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-19

Date Collected: 03/09/23 17:50
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-2

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 14:17	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 14:17	1
Benzene	**0.912**		0.500	0.220	ug/L			03/13/23 14:17	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 14:17	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 14:17	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 14:17	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 14:17	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 14:17	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 14:17	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 14:17	1
Chlorobenzene	**1.86**		1.00	0.400	ug/L			03/13/23 14:17	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 14:17	1
Chloroethane	**1.19**	**J**	4.00	0.790	ug/L			03/13/23 14:17	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 14:17	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 14:17	1
cis-1,2-Dichloroethene	**0.426**	**J**	1.00	0.210	ug/L			03/13/23 14:17	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 14:17	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 14:17	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 14:17	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 14:17	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 14:17	1
1,4-Dichlorobenzene	**0.366**	**J**	1.00	0.230	ug/L			03/13/23 14:17	1
1,1-Dichloroethane	**0.589**	**J**	1.00	0.220	ug/L			03/13/23 14:17	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 14:17	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 14:17	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 14:17	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 14:17	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 14:17	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 14:17	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 14:17	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 14:17	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 14:17	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 14:17	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 14:17	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 14:17	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 14:17	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 14:17	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 14:17	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 14:17	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 14:17	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 14:17	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 14:17	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 14:17	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 14:17	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 14:17	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 14:17	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 14:17	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-19

Date Collected: 03/09/23 17:50
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-2

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/13/23 14:17*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 128*		*03/13/23 14:17*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/13/23 14:17*	*1*

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<2.00		2.00	0.810	ug/L		03/13/23 10:34	03/16/23 13:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*60*		*10 - 136*	*03/13/23 10:34*	*03/16/23 13:40*	*1*
Tetrachloro-m-xylene	*75*		*10 - 130*	*03/13/23 10:34*	*03/16/23 13:40*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 20:31	1
Arsenic	**0.00177**	**J**	0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 20:31	1
Barium	**1.25**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 20:31	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 20:31	1
Cadmium	<0.000100		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 20:31	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:31	1
Cobalt	**0.0231**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 20:31	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 20:31	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 20:31	1
Nickel	**0.0606**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 20:31	1
Selenium	<0.00500		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 20:31	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 20:31	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 20:31	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:31	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 20:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		03/14/23 18:05	03/15/23 04:29	1
Total Suspended Solids (USGS I-3765-85)	**1.63**	**J**	1.88	0.638	mg/L			03/13/23 14:52	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-20

Date Collected: 03/09/23 17:01
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-3

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**6.42**	**J**	10.0	3.10	ug/L			03/13/23 18:34	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 18:34	1
Benzene	**3.14**		0.500	0.220	ug/L			03/13/23 18:34	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 18:34	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 18:34	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 18:34	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 18:34	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 18:34	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 18:34	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 18:34	1
Chlorobenzene	**4.44**		1.00	0.400	ug/L			03/13/23 18:34	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 18:34	1
Chloroethane	**1.00**	**J**	4.00	0.790	ug/L			03/13/23 18:34	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 18:34	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 18:34	1
cis-1,2-Dichloroethene	**0.327**	**J**	1.00	0.210	ug/L			03/13/23 18:34	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 18:34	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 18:34	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 18:34	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 18:34	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 18:34	1
1,4-Dichlorobenzene	**2.40**		1.00	0.230	ug/L			03/13/23 18:34	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 18:34	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 18:34	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 18:34	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 18:34	1
Ethylbenzene	**0.332**	**J**	1.00	0.310	ug/L			03/13/23 18:34	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 18:34	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 18:34	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 18:34	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 18:34	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 18:34	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 18:34	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 18:34	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 18:34	1
Toluene	**0.701**	**J**	1.00	0.430	ug/L			03/13/23 18:34	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 18:34	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 18:34	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 18:34	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 18:34	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 18:34	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 18:34	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 18:34	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 18:34	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 18:34	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 18:34	1
Xylenes, Total	**0.551**	**J**	3.00	0.400	ug/L			03/13/23 18:34	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-20

Date Collected: 03/09/23 17:01
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-3

Matrix: Ground Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		80 - 120		03/13/23 18:34	1
Dibromofluoromethane (Surr)	106		80 - 128		03/13/23 18:34	1
Toluene-d8 (Surr)	98		80 - 120		03/13/23 18:34	1

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Endosulfan I	**0.112**		0.0627	0.0324	ug/L		03/13/23 10:34	03/16/23 13:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	56		10 - 136	03/13/23 10:34	03/16/23 13:53	1
Tetrachloro-m-xylene	97		10 - 130	03/13/23 10:34	03/16/23 13:53	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 20:33	1
Arsenic	**0.0813**		0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 20:33	1
Barium	**3.80**		0.00800	0.00352	mg/L		03/14/23 09:25	03/15/23 12:17	4
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 20:33	1
Cadmium	**0.0000590**	**J**	0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 20:33	1
Chromium	**0.00168**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:33	1
Cobalt	**0.0158**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 20:33	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 20:33	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 20:33	1
Nickel	**0.0787**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 20:33	1
Selenium	**0.00108**	**J**	0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 20:33	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 20:33	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 20:33	1
Vanadium	**0.00379**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:33	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 20:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		03/14/23 18:13	03/15/23 04:49	1
Total Suspended Solids (USGS I-3765-85)	**114**		15.0	5.10	mg/L			03/13/23 14:52	1

Method: 2,4,5-T ONLY - SW846 8151 Herbicide

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	<0.5		0.5		ug/L		03/16/23 08:11	03/21/23 18:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,5-Dichlorobenzoic Acid	110		31 - 116	03/16/23 08:11	03/21/23 18:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-21

Date Collected: 03/09/23 14:32
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-4

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 14:38	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 14:38	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 14:38	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 14:38	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 14:38	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 14:38	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 14:38	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 14:38	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 14:38	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 14:38	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 14:38	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 14:38	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 14:38	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 14:38	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 14:38	1
cis-1,2-Dichloroethene	**0.233**	**J**	1.00	0.210	ug/L			03/13/23 14:38	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 14:38	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 14:38	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 14:38	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 14:38	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 14:38	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 14:38	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 14:38	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 14:38	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 14:38	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 14:38	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 14:38	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 14:38	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 14:38	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 14:38	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 14:38	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 14:38	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 14:38	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 14:38	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 14:38	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 14:38	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 14:38	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 14:38	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 14:38	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 14:38	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 14:38	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 14:38	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 14:38	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 14:38	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 14:38	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 14:38	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 14:38	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-21

Date Collected: 03/09/23 14:32
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-4

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*03/13/23 14:38*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 128*		*03/13/23 14:38*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 14:38*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 20:36	1
Arsenic	**0.00194**	**J**	0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 20:36	1
Barium	**1.21**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 20:36	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 20:36	1
Cadmium	<0.000100		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 20:36	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:36	1
Cobalt	**0.00573**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 20:36	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 20:36	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 20:36	1
Nickel	**0.00853**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 20:36	1
Selenium	<0.00500		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 20:36	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 20:36	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 20:36	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:36	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 20:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		03/14/23 18:16	03/15/23 04:55	1
Total Suspended Solids (USGS I-3765-85)	**4.38**		1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-24

Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 15:00	1
Acrolein	<10.0		10.0	3.60	ug/L			03/13/23 15:00	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 15:00	1
Allyl chloride	<2.00		2.00	0.700	ug/L			03/13/23 15:00	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 15:00	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 15:00	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 15:00	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 15:00	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 15:00	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 15:00	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 15:00	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 15:00	1
Chlorobenzene	**0.911**	**J**	1.00	0.400	ug/L			03/13/23 15:00	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 15:00	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 15:00	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 15:00	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 15:00	1
Chloroprene	<1.00		1.00	0.230	ug/L			03/13/23 15:00	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 15:00	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 15:00	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 15:00	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 15:00	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 15:00	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 15:00	1
1,3-Dichlorobenzene	<1.00		1.00	0.300	ug/L			03/13/23 15:00	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 15:00	1
Dichlorodifluoromethane	<3.00		3.00	0.250	ug/L			03/13/23 15:00	1
1,1-Dichloroethane	**0.394**	**J**	1.00	0.220	ug/L			03/13/23 15:00	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 15:00	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 15:00	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 15:00	1
1,3-Dichloropropane	<1.00		1.00	0.400	ug/L			03/13/23 15:00	1
2,2-Dichloropropane	<4.00		4.00	0.690	ug/L			03/13/23 15:00	1
1,1-Dichloropropene	<1.00		1.00	0.430	ug/L			03/13/23 15:00	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 15:00	1
Ethyl methacrylate	<2.00		2.00	0.680	ug/L			03/13/23 15:00	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 15:00	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 15:00	1
Methacrylonitrile	<10.0		10.0	3.30	ug/L			03/13/23 15:00	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 15:00	1
Methyl methacrylate	<2.00		2.00	0.760	ug/L			03/13/23 15:00	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 15:00	1
Naphthalene	<5.00		5.00	3.00	ug/L			03/13/23 15:00	1
Propionitrile	<10.0		10.0	3.40	ug/L			03/13/23 15:00	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 15:00	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 15:00	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 15:00	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 15:00	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-24

Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 15:00	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 15:00	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 15:00	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 15:00	1
1,2,4-Trichlorobenzene	<5.00		5.00	0.750	ug/L			03/13/23 15:00	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 15:00	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 15:00	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 15:00	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 15:00	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 15:00	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 15:00	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 15:00	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/13/23 15:00*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 128*		*03/13/23 15:00*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 15:00*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<10.0		10.0	0.640	ug/L		03/13/23 10:26	03/15/23 19:29	1
Acenaphthylene	<10.0		10.0	0.720	ug/L		03/13/23 10:26	03/15/23 19:29	1
Acetophenone	<10.0		10.0	0.690	ug/L		03/13/23 10:26	03/15/23 19:29	1
2-Acetylaminofluorene	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/16/23 11:17	1
4-Aminobiphenyl	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/16/23 11:17	1
Anthracene	<10.0		10.0	0.870	ug/L		03/13/23 10:26	03/15/23 19:29	1
Benzo(a)anthracene	<10.0		10.0	0.850	ug/L		03/13/23 10:26	03/15/23 19:29	1
Benzo(a)pyrene	<10.0		10.0	8.10	ug/L		03/13/23 10:26	03/15/23 19:29	1
Benzo(b)fluoranthene	<10.0		10.0	4.90	ug/L		03/13/23 10:26	03/15/23 19:29	1
Benzo(g,h,i)perylene	<10.0		10.0	6.30	ug/L		03/13/23 10:26	03/15/23 19:29	1
Benzo(k)fluoranthene	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/15/23 19:29	1
Benzyl alcohol	<10.0		10.0	1.30	ug/L		03/13/23 10:26	03/15/23 19:29	1
Bis(2-chloroethoxy)methane	<10.0		10.0	0.760	ug/L		03/13/23 10:26	03/15/23 19:29	1
Bis(2-chloroethyl)ether	<10.0		10.0	0.820	ug/L		03/13/23 10:26	03/15/23 19:29	1
bis(2-chloroisopropyl) ether	<10.0		10.0	0.540	ug/L		03/13/23 10:26	03/15/23 19:29	1
Bis(2-ethylhexyl) phthalate	<10.0		10.0	5.50	ug/L		03/13/23 10:26	03/15/23 19:29	1
4-Bromophenyl phenyl ether	<10.0		10.0	0.700	ug/L		03/13/23 10:26	03/15/23 19:29	1
Butyl benzyl phthalate	<10.0		10.0	5.40	ug/L		03/13/23 10:26	03/15/23 19:29	1
4-Chloroaniline	<10.0	*1	10.0	0.620	ug/L		03/13/23 10:26	03/15/23 19:29	1
Chlorobenzilate	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 11:17	1
4-Chloro-3-methylphenol	<10.0		10.0	0.840	ug/L		03/13/23 10:26	03/15/23 19:29	1
2-Chloronaphthalene	<10.0		10.0	0.640	ug/L		03/13/23 10:26	03/15/23 19:29	1
2-Chlorophenol	<10.0		10.0	0.540	ug/L		03/13/23 10:26	03/15/23 19:29	1
4-Chlorophenyl phenyl ether	<10.0		10.0	0.690	ug/L		03/13/23 10:26	03/15/23 19:29	1
Chrysene	<10.0		10.0	0.870	ug/L		03/13/23 10:26	03/15/23 19:29	1
Diallate	<10.0		10.0	4.00	ug/L		03/13/23 10:26	03/16/23 11:17	1
Dibenz(a,h)anthracene	<10.0		10.0	3.90	ug/L		03/13/23 10:26	03/15/23 19:29	1
Dibenzofuran	<10.0		10.0	0.740	ug/L		03/13/23 10:26	03/15/23 19:29	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-24

Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5

Matrix: Ground Water

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3,3'-Dichlorobenzidine	<10.0		10.0	1.40	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,4-Dichlorophenol	<10.0		10.0	0.850	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,6-Dichlorophenol	<10.0		10.0	0.690	ug/L		03/13/23 10:26	03/15/23 19:29	1
Diethyl phthalate	<10.0		10.0	1.70	ug/L		03/13/23 10:26	03/15/23 19:29	1
Dimethoate	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 11:17	1
7,12-Dimethylbenz(a)anthracene	<10.0		10.0	1.90	ug/L		03/13/23 10:26	03/16/23 11:17	1
3,3'-Dimethylbenzidine	<10.0		10.0	1.50	ug/L		03/13/23 10:26	03/16/23 11:17	1
2,4-Dimethylphenol	<10.0		10.0	0.580	ug/L		03/13/23 10:26	03/15/23 19:29	1
Dimethyl phthalate	<10.0		10.0	1.00	ug/L		03/13/23 10:26	03/15/23 19:29	1
Di-n-butyl phthalate	<10.0		10.0	5.60	ug/L		03/13/23 10:26	03/15/23 19:29	1
1,3-Dinitrobenzene	<10.0		10.0	3.20	ug/L		03/13/23 10:26	03/15/23 19:29	1
4,6-Dinitro-2-methylphenol	<10.0		10.0	6.90	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,4-Dinitrophenol	<20.0		20.0	13.0	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,4-Dinitrotoluene	<10.0		10.0	6.40	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,6-Dinitrotoluene	<10.0		10.0	0.520	ug/L		03/13/23 10:26	03/15/23 19:29	1
Di-n-octyl phthalate	<20.0		20.0	7.00	ug/L		03/13/23 10:26	03/15/23 19:29	1
Dinoseb	<10.0		10.0	2.40	ug/L		03/13/23 10:26	03/16/23 11:17	1
Diphenylamine	<10.0		10.0	6.00	ug/L		03/13/23 10:26	03/15/23 19:29	1
Disulfoton	<10.0		10.0	2.40	ug/L		03/13/23 10:26	03/16/23 11:17	1
Ethyl methanesulfonate	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 11:17	1
Ethyl parathion	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/16/23 11:17	1
Famphur	<10.0		10.0	3.80	ug/L		03/13/23 10:26	03/16/23 11:17	1
Fluoranthene	<10.0		10.0	1.70	ug/L		03/13/23 10:26	03/15/23 19:29	1
Fluorene	<10.0		10.0	0.790	ug/L		03/13/23 10:26	03/15/23 19:29	1
Hexachlorobenzene	<10.0		10.0	0.700	ug/L		03/13/23 10:26	03/15/23 19:29	1
Hexachlorobutadiene	<10.0		10.0	0.860	ug/L		03/13/23 10:26	03/15/23 19:29	1
Hexachlorocyclopentadiene	<10.0		10.0	5.10	ug/L		03/13/23 10:26	03/15/23 19:29	1
Hexachloroethane	<10.0		10.0	0.970	ug/L		03/13/23 10:26	03/15/23 19:29	1
Hexachloropropene	<10.0		10.0	2.60	ug/L		03/13/23 10:26	03/16/23 11:17	1
Indeno(1,2,3-cd)pyrene	<10.0		10.0	4.20	ug/L		03/13/23 10:26	03/15/23 19:29	1
Isodrin	<10.0		10.0	4.70	ug/L		03/13/23 10:26	03/16/23 11:17	1
Isophorone	<10.0		10.0	0.930	ug/L		03/13/23 10:26	03/15/23 19:29	1
Isosafrole	<10.0		10.0	2.30	ug/L		03/13/23 10:26	03/16/23 11:17	1
Kepone	<10.0		10.0	1.00	ug/L		03/13/23 10:26	03/16/23 11:17	1
Methapyrilene	<10.0		10.0	0.760	ug/L		03/13/23 10:26	03/16/23 11:17	1
3-Methylcholanthrene	<10.0		10.0	0.320	ug/L		03/13/23 10:26	03/16/23 11:17	1
Methyl methanesulfonate	<10.0		10.0	3.30	ug/L		03/13/23 10:26	03/16/23 11:17	1
2-Methylnaphthalene	**0.698**	**J**	10.0	0.590	ug/L		03/13/23 10:26	03/15/23 19:29	1
Methyl parathion	<10.0		10.0	2.30	ug/L		03/13/23 10:26	03/16/23 11:17	1
2-Methylphenol	<10.0		10.0	0.650	ug/L		03/13/23 10:26	03/15/23 19:29	1
4-Methylphenol (and/or 3-Methylphenol)	<10.0		10.0	0.700	ug/L		03/13/23 10:26	03/15/23 19:29	1
1,4-Naphthoquinone	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 11:17	1
1-Naphthylamine	<10.0		10.0	2.50	ug/L		03/13/23 10:26	03/16/23 11:17	1
2-Naphthylamine	<10.0		10.0	2.10	ug/L		03/13/23 10:26	03/16/23 11:17	1
2-Nitroaniline	<10.0		10.0	5.90	ug/L		03/13/23 10:26	03/15/23 19:29	1
3-Nitroaniline	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/15/23 19:29	1
4-Nitroaniline	<10.0		10.0	1.30	ug/L		03/13/23 10:26	03/15/23 19:29	1
Nitrobenzene	<10.0		10.0	0.800	ug/L		03/13/23 10:26	03/15/23 19:29	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-24

Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5

Matrix: Ground Water

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
5-Nitro-o-toluidine	<10.0		10.0	2.80	ug/L		03/13/23 10:26	03/16/23 11:17	1
2-Nitrophenol	<10.0		10.0	6.80	ug/L		03/13/23 10:26	03/15/23 19:29	1
4-Nitrophenol	<10.0		10.0	7.60	ug/L		03/13/23 10:26	03/15/23 19:29	1
N-Nitrosodiethylamine	<10.0		10.0	3.40	ug/L		03/13/23 10:26	03/16/23 11:17	1
N-Nitrosodimethylamine	<10.0		10.0	0.720	ug/L		03/13/23 10:26	03/15/23 19:29	1
N-Nitrosodi-n-butylamine	<10.0		10.0	3.90	ug/L		03/13/23 10:26	03/16/23 11:17	1
N-Nitrosodi-n-propylamine	<10.0		10.0	0.920	ug/L		03/13/23 10:26	03/15/23 19:29	1
N-Nitrosodiphenylamine	<10.0		10.0	0.750	ug/L		03/13/23 10:26	03/15/23 19:29	1
N-Nitrosomethylethylamine	<10.0		10.0	4.90	ug/L		03/13/23 10:26	03/16/23 11:17	1
N-Nitrosopiperidine	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/16/23 11:17	1
N-Nitrosopyrrolidine	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 11:17	1
o,o',o''-Triethylphosphorothioate	<10.0		10.0	3.20	ug/L		03/13/23 10:26	03/16/23 11:17	1
o-Toluidine	<10.0		10.0	2.90	ug/L		03/13/23 10:26	03/16/23 11:17	1
p-Dimethylamino azobenzene	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/16/23 11:17	1
Pentachlorobenzene	<10.0		10.0	2.80	ug/L		03/13/23 10:26	03/16/23 11:17	1
Pentachloronitrobenzene	<10.0		10.0	5.80	ug/L		03/13/23 10:26	03/16/23 11:17	1
Pentachlorophenol	<10.0		10.0	9.60	ug/L		03/13/23 10:26	03/15/23 19:29	1
Phenacetin	<10.0		10.0	1.90	ug/L		03/13/23 10:26	03/16/23 11:17	1
Phenanthrene	<10.0		10.0	0.790	ug/L		03/13/23 10:26	03/15/23 19:29	1
Phenol	<10.0		10.0	1.10	ug/L		03/13/23 10:26	03/15/23 19:29	1
1,4-Phenylenediamine	<10.0		10.0	1.90	ug/L		03/13/23 10:26	03/16/23 11:17	1
Phorate	<10.0		10.0	3.20	ug/L		03/13/23 10:26	03/16/23 11:17	1
Pronamide	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/16/23 11:17	1
Pyrene	<10.0		10.0	0.790	ug/L		03/13/23 10:26	03/15/23 19:29	1
Safrole	<10.0		10.0	2.80	ug/L		03/13/23 10:26	03/16/23 11:17	1
1,2,4,5-Tetrachlorobenzene	<10.0		10.0	0.540	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,3,4,6-Tetrachlorophenol	<10.0		10.0	5.30	ug/L		03/13/23 10:26	03/15/23 19:29	1
Thionazin	<10.0		10.0	3.50	ug/L		03/13/23 10:26	03/16/23 11:17	1
2,4,5-Trichlorophenol	<10.0		10.0	5.30	ug/L		03/13/23 10:26	03/15/23 19:29	1
2,4,6-Trichlorophenol	<10.0		10.0	5.00	ug/L		03/13/23 10:26	03/15/23 19:29	1
1,3,5-Trinitrobenzene	<10.0		10.0	2.30	ug/L		03/13/23 10:26	03/16/23 11:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*80*		*28 - 110*	*03/13/23 10:26*	*03/15/23 19:29*	*1*
2-Fluorophenol (Surr)	*67*		*13 - 110*	*03/13/23 10:26*	*03/15/23 19:29*	*1*
Nitrobenzene-d5 (Surr)	*82*		*27 - 115*	*03/13/23 10:26*	*03/15/23 19:29*	*1*
Phenol-d5 (Surr)	*56*		*12 - 110*	*03/13/23 10:26*	*03/15/23 19:29*	*1*
Terphenyl-d14 (Surr)	*90*		*10 - 125*	*03/13/23 10:26*	*03/15/23 19:29*	*1*
2,4,6-Tribromophenol (Surr)	*78*		*15 - 121*	*03/13/23 10:26*	*03/15/23 19:29*	*1*

Method: SW846 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetonitrile	<10.0		10.0	0.570	mg/L			03/14/23 20:07	1
Isobutanol	<10.0		10.0	0.550	mg/L			03/14/23 20:07	1

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	<0.0640		0.0640	0.0320	ug/L		03/13/23 10:34	03/16/23 14:06	1
alpha-BHC	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 14:06	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-24

Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5

Matrix: Ground Water

Method: SW846 8081B - Organochlorine Pesticides (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0640		0.0640	0.0370	ug/L		03/13/23 10:34	03/16/23 14:06	1
Chlordane (technical)	<2.00		2.00	0.810	ug/L		03/13/23 10:34	03/16/23 14:06	1
4,4'-DDD	<0.0640		0.0640	0.0270	ug/L		03/13/23 10:34	03/16/23 14:06	1
4,4'-DDE	<0.0640		0.0640	0.0270	ug/L		03/13/23 10:34	03/16/23 14:06	1
4,4'-DDT	<0.0640		0.0640	0.0420	ug/L		03/13/23 10:34	03/16/23 14:06	1
delta-BHC	<0.0640		0.0640	0.0270	ug/L		03/13/23 10:34	03/16/23 14:06	1
Dieldrin	<0.0640		0.0640	0.0260	ug/L		03/13/23 10:34	03/16/23 14:06	1
Endosulfan I	<0.0640		0.0640	0.0330	ug/L		03/13/23 10:34	03/16/23 14:06	1
Endosulfan II	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 14:06	1
Endosulfan sulfate	<0.0640		0.0640	0.0300	ug/L		03/13/23 10:34	03/16/23 14:06	1
Endrin	<0.0640		0.0640	0.0260	ug/L		03/13/23 10:34	03/16/23 14:06	1
Endrin aldehyde	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 14:06	1
gamma-BHC (Lindane)	<0.0640		0.0640	0.0360	ug/L		03/13/23 10:34	03/16/23 14:06	1
Heptachlor	<0.0640		0.0640	0.0330	ug/L		03/13/23 10:34	03/16/23 14:06	1
Heptachlor epoxide	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 14:06	1
Methoxychlor	<0.0640		0.0640	0.0410	ug/L		03/13/23 10:34	03/16/23 14:06	1
Toxaphene	<2.00		2.00	0.690	ug/L		03/13/23 10:34	03/16/23 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*48*		*10 - 136*	*03/13/23 10:34*	*03/16/23 14:06*	*1*
Tetrachloro-m-xylene	*53*		*10 - 130*	*03/13/23 10:34*	*03/16/23 14:06*	*1*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 14:06	1
PCB-1221	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 14:06	1
PCB-1232	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 14:06	1
PCB-1242	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 14:06	1
PCB-1248	<0.800		0.800	0.110	ug/L		03/13/23 10:34	03/16/23 14:06	1
PCB-1254	<0.800		0.800	0.110	ug/L		03/13/23 10:34	03/16/23 14:06	1
PCB-1260	<0.800		0.800	0.110	ug/L		03/13/23 10:34	03/16/23 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*48*		*10 - 136*	*03/13/23 10:34*	*03/16/23 14:06*	*1*
Tetrachloro-m-xylene	*53*		*10 - 130*	*03/13/23 10:34*	*03/16/23 14:06*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 20:39	1
Arsenic	**0.00127**	**J**	0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 20:39	1
Barium	**0.819**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 20:39	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 20:39	1
Cadmium	**0.000692**		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 20:39	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:39	1
Cobalt	**0.00283**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 20:39	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 20:39	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 20:39	1
Nickel	**0.0301**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 20:39	1
Selenium	<0.00500		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 20:39	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-24

Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5

Matrix: Ground Water

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 20:39	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 20:39	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:39	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 20:39	1
Tin	<5.00		5.00	3.00	ug/L		03/14/23 09:25	03/14/23 20:39	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		03/15/23 14:54	03/16/23 14:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (SW846 9012B)	<0.0100		0.0100	0.00430	mg/L		03/14/23 10:19	03/16/23 22:51	1
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		03/14/23 18:19	03/15/23 05:02	1
Total Suspended Solids (USGS I-3765-85)	**1.63**	**J**	1.88	0.638	mg/L			03/14/23 07:04	1

Method: 2,4-D/2,4,5-T/2,4,5-TP - SW846 8151 Herbicide

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	<0.5		0.5		ug/L		03/16/23 08:11	03/21/23 19:26	1
2,4,5-TP (Silvex)	<0.5		0.5		ug/L		03/16/23 08:11	03/21/23 19:26	1
2,4-D	<2.0		2.0		ug/L		03/16/23 08:11	03/21/23 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dichlorobenzoic Acid	*108*		*31 - 116*	*03/16/23 08:11*	*03/21/23 19:26*	*1*

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-37R

Date Collected: 03/09/23 15:15
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-6

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 18:55	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 18:55	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 18:55	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 18:55	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 18:55	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 18:55	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 18:55	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 18:55	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 18:55	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 18:55	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 18:55	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 18:55	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 18:55	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 18:55	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 18:55	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 18:55	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 18:55	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 18:55	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 18:55	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 18:55	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 18:55	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 18:55	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 18:55	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 18:55	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 18:55	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 18:55	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 18:55	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 18:55	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 18:55	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 18:55	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 18:55	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 18:55	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 18:55	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 18:55	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 18:55	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 18:55	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 18:55	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 18:55	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 18:55	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 18:55	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 18:55	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 18:55	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 18:55	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 18:55	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 18:55	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 18:55	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 18:55	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-37R

Date Collected: 03/09/23 15:15
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-6

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*03/13/23 18:55*	*1*
Dibromofluoromethane (Surr)	*98*		*80 - 128*		*03/13/23 18:55*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/13/23 18:55*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00153**	**J**	0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 20:42	1
Arsenic	**0.000838**	**J**	0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 20:42	1
Barium	**0.863**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 20:42	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 20:42	1
Cadmium	**0.000186**		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 20:42	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:42	1
Cobalt	**0.000690**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 20:42	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 20:42	1
Lead	**0.00159**		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 20:42	1
Nickel	**0.00366**	**J**	0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 20:42	1
Selenium	**0.0201**		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 20:42	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 20:42	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 20:42	1
Vanadium	**0.00272**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 20:42	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 20:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**88.5**		7.50	2.55	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-38R

Date Collected: 03/10/23 10:49
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-7

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 15:21	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 15:21	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 15:21	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 15:21	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 15:21	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 15:21	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 15:21	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 15:21	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 15:21	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 15:21	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 15:21	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 15:21	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 15:21	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 15:21	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 15:21	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 15:21	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 15:21	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 15:21	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 15:21	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 15:21	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 15:21	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 15:21	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 15:21	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 15:21	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 15:21	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 15:21	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 15:21	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 15:21	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 15:21	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 15:21	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 15:21	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 15:21	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 15:21	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 15:21	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 15:21	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 15:21	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 15:21	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 15:21	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 15:21	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 15:21	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 15:21	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 15:21	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 15:21	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 15:21	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 15:21	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 15:21	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 15:21	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-38R

Date Collected: 03/10/23 10:49
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-7

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/13/23 15:21*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 128*		*03/13/23 15:21*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/13/23 15:21*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 21:08	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 21:08	1
Barium	**0.261**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 21:08	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 21:08	1
Cadmium	**0.0000780**	**J**	0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 21:08	1
Chromium	**0.00457**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:08	1
Cobalt	**0.000323**	**J**	0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 21:08	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 21:08	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 21:08	1
Nickel	**0.00569**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 21:08	1
Selenium	**0.0291**		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 21:08	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 21:08	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 21:08	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:08	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 21:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**3.75**		1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-39

Date Collected: 03/09/23 11:19
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-8

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 15:42	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 15:42	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 15:42	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 15:42	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 15:42	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 15:42	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 15:42	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 15:42	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 15:42	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 15:42	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 15:42	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 15:42	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 15:42	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 15:42	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 15:42	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 15:42	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 15:42	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 15:42	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 15:42	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 15:42	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 15:42	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 15:42	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 15:42	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 15:42	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 15:42	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 15:42	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 15:42	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 15:42	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 15:42	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 15:42	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 15:42	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 15:42	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 15:42	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 15:42	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 15:42	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 15:42	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 15:42	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 15:42	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 15:42	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 15:42	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 15:42	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 15:42	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 15:42	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 15:42	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 15:42	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 15:42	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 15:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-39

Date Collected: 03/09/23 11:19
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-8

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*03/13/23 15:42*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 128*		*03/13/23 15:42*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 15:42*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 21:11	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 21:11	1
Barium	**0.0949**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 21:11	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 21:11	1
Cadmium	**0.000129**		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 21:11	1
Chromium	**0.00215**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:11	1
Cobalt	<0.000500		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 21:11	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 21:11	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 21:11	1
Nickel	<0.00500		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 21:11	1
Selenium	**0.0794**		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 21:11	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 21:11	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 21:11	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:11	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 21:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**0.875**	**J**	1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-43

Date Collected: 03/08/23 15:16
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-9

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 16:04	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 16:04	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 16:04	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 16:04	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 16:04	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 16:04	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 16:04	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 16:04	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 16:04	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 16:04	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 16:04	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 16:04	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 16:04	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 16:04	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 16:04	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 16:04	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 16:04	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 16:04	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 16:04	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 16:04	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 16:04	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 16:04	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 16:04	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 16:04	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 16:04	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 16:04	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 16:04	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 16:04	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 16:04	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 16:04	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 16:04	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 16:04	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 16:04	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 16:04	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 16:04	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 16:04	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 16:04	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 16:04	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 16:04	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 16:04	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 16:04	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 16:04	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 16:04	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 16:04	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 16:04	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 16:04	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 16:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-43

Date Collected: 03/08/23 15:16
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-9

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/13/23 16:04*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 128*		*03/13/23 16:04*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/13/23 16:04*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 21:14	1
Arsenic	**0.000814**	**J**	0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 21:14	1
Barium	**0.202**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 21:14	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 21:14	1
Cadmium	**0.0000650**	**J**	0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 21:14	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:14	1
Cobalt	**0.000369**	**J**	0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 21:14	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 21:14	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 21:14	1
Nickel	**0.00291**	**J**	0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 21:14	1
Selenium	**0.0244**		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 21:14	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 21:14	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 21:14	1
Vanadium	**0.00178**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:14	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 21:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**2.50**		1.88	0.638	mg/L			03/13/23 14:52	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: UD-0

Date Collected: 03/10/23 09:20
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-10

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 19:16	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 19:16	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 19:16	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 19:16	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 19:16	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 19:16	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 19:16	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 19:16	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 19:16	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 19:16	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 19:16	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 19:16	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 19:16	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 19:16	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 19:16	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 19:16	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 19:16	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 19:16	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 19:16	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 19:16	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 19:16	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 19:16	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 19:16	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 19:16	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 19:16	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 19:16	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 19:16	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 19:16	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 19:16	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 19:16	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 19:16	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 19:16	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 19:16	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 19:16	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 19:16	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 19:16	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 19:16	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 19:16	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 19:16	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 19:16	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 19:16	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 19:16	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 19:16	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 19:16	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 19:16	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 19:16	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 19:16	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: UD-0

Date Collected: 03/10/23 09:20
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-10

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/13/23 19:16*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 128*		*03/13/23 19:16*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/13/23 19:16*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 21:17	1
Arsenic	**0.00254**		0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 21:17	1
Barium	**0.877**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 21:17	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 21:17	1
Cadmium	**0.000124**		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 21:17	1
Chromium	**0.00278**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:17	1
Cobalt	**0.00890**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 21:17	1
Copper	**0.00655**		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 21:17	1
Lead	**0.000358**	**J**	0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 21:17	1
Nickel	**0.0768**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 21:17	1
Selenium	**0.00145**	**J**	0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 21:17	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 21:17	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 21:17	1
Vanadium	**0.00300**	**J**	0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:17	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 21:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**2.63**		1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-DWT

Date Collected: 03/09/23 17:50
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-11

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 16:25	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 16:25	1
Benzene	**0.912**		0.500	0.220	ug/L			03/13/23 16:25	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 16:25	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 16:25	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 16:25	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 16:25	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 16:25	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 16:25	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 16:25	1
Chlorobenzene	**1.89**		1.00	0.400	ug/L			03/13/23 16:25	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 16:25	1
Chloroethane	**0.877**	**J**	4.00	0.790	ug/L			03/13/23 16:25	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 16:25	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 16:25	1
cis-1,2-Dichloroethene	**0.480**	**J**	1.00	0.210	ug/L			03/13/23 16:25	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 16:25	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 16:25	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 16:25	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 16:25	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 16:25	1
1,4-Dichlorobenzene	**0.365**	**J**	1.00	0.230	ug/L			03/13/23 16:25	1
1,1-Dichloroethane	**0.630**	**J**	1.00	0.220	ug/L			03/13/23 16:25	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 16:25	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 16:25	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 16:25	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 16:25	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 16:25	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 16:25	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 16:25	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 16:25	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 16:25	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 16:25	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 16:25	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 16:25	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 16:25	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 16:25	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 16:25	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 16:25	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 16:25	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 16:25	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 16:25	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 16:25	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 16:25	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 16:25	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 16:25	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 16:25	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-DWT

Lab Sample ID: 310-251194-11

Date Collected: 03/09/23 17:50
Matrix: Ground Water
Date Received: 03/10/23 16:15

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*03/13/23 16:25*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 128*		*03/13/23 16:25*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 16:25*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 21:19	1
Arsenic	**0.00183**	**J**	0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 21:19	1
Barium	**1.29**		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 21:19	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 21:19	1
Cadmium	<0.000100		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 21:19	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:19	1
Cobalt	**0.0240**		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 21:19	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 21:19	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 21:19	1
Nickel	**0.0627**		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 21:19	1
Selenium	<0.00500		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 21:19	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 21:19	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 21:19	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 21:19	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 21:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**5.25**		1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: Trip Blank 1

Lab Sample ID: 310-251194-12

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 12:30	1
Acrolein	<10.0		10.0	3.60	ug/L			03/13/23 12:30	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 12:30	1
Allyl chloride	<2.00		2.00	0.700	ug/L			03/13/23 12:30	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 12:30	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 12:30	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 12:30	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 12:30	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 12:30	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 12:30	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 12:30	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 12:30	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 12:30	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 12:30	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 12:30	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 12:30	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 12:30	1
Chloroprene	<1.00		1.00	0.230	ug/L			03/13/23 12:30	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 12:30	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 12:30	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 12:30	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 12:30	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 12:30	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 12:30	1
1,3-Dichlorobenzene	<1.00		1.00	0.300	ug/L			03/13/23 12:30	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 12:30	1
Dichlorodifluoromethane	<3.00		3.00	0.250	ug/L			03/13/23 12:30	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 12:30	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 12:30	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 12:30	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 12:30	1
1,3-Dichloropropane	<1.00		1.00	0.400	ug/L			03/13/23 12:30	1
2,2-Dichloropropane	<4.00		4.00	0.690	ug/L			03/13/23 12:30	1
1,1-Dichloropropene	<1.00		1.00	0.430	ug/L			03/13/23 12:30	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 12:30	1
Ethyl methacrylate	<2.00		2.00	0.680	ug/L			03/13/23 12:30	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 12:30	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 12:30	1
Methacrylonitrile	<10.0		10.0	3.30	ug/L			03/13/23 12:30	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 12:30	1
Methyl methacrylate	<2.00		2.00	0.760	ug/L			03/13/23 12:30	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 12:30	1
Naphthalene	<5.00		5.00	3.00	ug/L			03/13/23 12:30	1
Propionitrile	<10.0		10.0	3.40	ug/L			03/13/23 12:30	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 12:30	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 12:30	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 12:30	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 12:30	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: Trip Blank 1

Lab Sample ID: 310-251194-12

Date Collected: 03/08/23 00:00
Date Received: 03/10/23 16:15

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 12:30	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 12:30	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 12:30	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 12:30	1
1,2,4-Trichlorobenzene	<5.00		5.00	0.750	ug/L			03/13/23 12:30	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 12:30	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 12:30	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 12:30	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 12:30	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 12:30	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 12:30	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 12:30	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 12:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/13/23 12:30*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 128*		*03/13/23 12:30*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*03/13/23 12:30*	*1*

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: Trip Blank 2

Lab Sample ID: 310-251194-13

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 12:51	1
Acrolein	<10.0		10.0	3.60	ug/L			03/13/23 12:51	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 12:51	1
Allyl chloride	<2.00		2.00	0.700	ug/L			03/13/23 12:51	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 12:51	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 12:51	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 12:51	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 12:51	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 12:51	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 12:51	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 12:51	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 12:51	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 12:51	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 12:51	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 12:51	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 12:51	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 12:51	1
Chloroprene	<1.00		1.00	0.230	ug/L			03/13/23 12:51	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 12:51	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 12:51	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 12:51	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 12:51	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 12:51	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 12:51	1
1,3-Dichlorobenzene	<1.00		1.00	0.300	ug/L			03/13/23 12:51	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 12:51	1
Dichlorodifluoromethane	<3.00		3.00	0.250	ug/L			03/13/23 12:51	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 12:51	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 12:51	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 12:51	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 12:51	1
1,3-Dichloropropane	<1.00		1.00	0.400	ug/L			03/13/23 12:51	1
2,2-Dichloropropane	<4.00		4.00	0.690	ug/L			03/13/23 12:51	1
1,1-Dichloropropene	<1.00		1.00	0.430	ug/L			03/13/23 12:51	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 12:51	1
Ethyl methacrylate	<2.00		2.00	0.680	ug/L			03/13/23 12:51	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 12:51	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 12:51	1
Methacrylonitrile	<10.0		10.0	3.30	ug/L			03/13/23 12:51	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 12:51	1
Methyl methacrylate	<2.00		2.00	0.760	ug/L			03/13/23 12:51	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 12:51	1
Naphthalene	<5.00		5.00	3.00	ug/L			03/13/23 12:51	1
Propionitrile	<10.0		10.0	3.40	ug/L			03/13/23 12:51	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 12:51	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 12:51	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 12:51	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 12:51	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: Trip Blank 2

Lab Sample ID: 310-251194-13

Date Collected: 03/08/23 00:00
Date Received: 03/10/23 16:15

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 12:51	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 12:51	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 12:51	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 12:51	1
1,2,4-Trichlorobenzene	<5.00		5.00	0.750	ug/L			03/13/23 12:51	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 12:51	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 12:51	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 12:51	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 12:51	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 12:51	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 12:51	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 12:51	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 12:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/13/23 12:51*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 128*		*03/13/23 12:51*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 12:51*	*1*

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*1	LCS/LCSD 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.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Subcontract

Qualifier	Qualifier Description
QR-06	The reference standard was outside of established control limits.
S-07	The surrogate recovery for this sample is outside of established 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
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TNTC	Too Numerous To Count

Surrogate Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 8260D - 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)	(80-128)	(80-120)
310-251194-1	MW-15R	97	99	98
310-251194-1 MS	MW-15R	96	102	101
310-251194-1 MSD	MW-15R	99	99	100
310-251194-2	MW-19	98	103	99
310-251194-3	MW-20	97	106	98
310-251194-4	MW-21	97	103	98
310-251194-5	MW-24	99	103	98
310-251194-6	MW-37R	97	98	97
310-251194-7	MW-38R	99	100	99
310-251194-8	MW-39	97	99	98
310-251194-9	MW-43	98	101	97
310-251194-10	UD-0	98	101	97
310-251194-11	MW-DWT	97	104	98

Surrogate Legend

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

Method: 8260D - 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)	(80-128)	(80-120)
310-251194-12	Trip Blank 1	98	101	99
310-251194-13	Trip Blank 2	99	100	98
LCS 310-381097/6	Lab Control Sample	98	98	100
LCS 310-381097/7	Lab Control Sample	98	101	98
MB 310-381097/5	Method Blank	98	102	98

Surrogate Legend

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

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

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

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	NBZ	PHL	TPHL	TBP
Lab Sample ID	Client Sample ID	(28-110)	(13-110)	(27-115)	(12-110)	(10-125)	(15-121)
310-251194-5	MW-24	80	67	82	56	90	78

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)
TBP = 2,4,6-Tribromophenol (Surr)

Surrogate Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

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

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	NBZ	PHL	TPHL	TBP
Lab Sample ID	Client Sample ID	(28-110)	(13-110)	(27-115)	(12-110)	(10-125)	(15-121)
LCS 310-381115/2-A	Lab Control Sample	85	73	86	61	95	85
LCSD 310-381115/3-A	Lab Control Sample Dup	52	46	56	39	59	53
MB 310-381115/1-A	Method Blank	69	59	75	50	81	61

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)
TBP = 2,4,6-Tribromophenol (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	(10-136)	(10-130)
310-251194-2	MW-19	60	75
310-251194-3	MW-20	56	97
310-251194-5	MW-24	48	53

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	(10-136)	(10-130)
LCS 310-381117/4-A	Lab Control Sample	48	60
LCSD 310-381117/5-A	Lab Control Sample Dup	56	64
MB 310-381117/1-A	Method Blank	89	117

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	(10-136)	(10-130)
310-251194-5	MW-24	48	53

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Surrogate Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

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	(10-136)	(10-130)
LCS 310-381117/2-A	Lab Control Sample	68	100
LCSD 310-381117/3-A	Lab Control Sample Dup	57	86
MB 310-381117/1-A	Method Blank	89	117

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: 2,4,5-T ONLY - SW846 8151 Herbicide

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

		Percent Surrogate Recovery (Acceptance Limits)
		ılorobenz
Lab Sample ID	Client Sample ID	(31-116)
310-251194-3	MW-20	110

Surrogate Legend

2,5-Dichlorobenzoic Acid = 2,5-Dichlorobenzoic Acid

Method: 2,4,5-T ONLY - SW846 8151 Herbicide

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

		Percent Surrogate Recovery (Acceptance Limits)
		ılorobenz
Lab Sample ID	Client Sample ID	(31-116)
1GC0901-BLK1	Method Blank	104
1GC0901-BS1	Lab Control Sample	117 S-07
1GC0901-MS1	Matrix Spike	110
1GC0901-MSD1	Matrix Spike Duplicate	110
1GC0901-SRM1	Lab Control Sample	116

Surrogate Legend

2,5-Dichlorobenzoic Acid = 2,5-Dichlorobenzoic Acid

Method: 2,4-D/2,4,5-T/2,4,5-TP - SW846 8151 Herbicide

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

		Percent Surrogate Recovery (Acceptance Limits)
		ılorobenz
Lab Sample ID	Client Sample ID	(31-116)
310-251194-5	MW-24	108

Surrogate Legend

2,5-Dichlorobenzoic Acid = 2,5-Dichlorobenzoic Acid

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 310-381097/5
Matrix: Water
Analysis Batch: 381097

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	3.10	ug/L			03/13/23 11:26	1
Acrolein	<10.0		10.0	3.60	ug/L			03/13/23 11:26	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 11:26	1
Allyl chloride	<2.00		2.00	0.700	ug/L			03/13/23 11:26	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 11:26	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 11:26	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 11:26	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 11:26	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 11:26	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 11:26	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 11:26	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 11:26	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 11:26	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 11:26	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 11:26	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 11:26	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 11:26	1
Chloroprene	<1.00		1.00	0.230	ug/L			03/13/23 11:26	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 11:26	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 11:26	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 11:26	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 11:26	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 11:26	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 11:26	1
1,3-Dichlorobenzene	<1.00		1.00	0.300	ug/L			03/13/23 11:26	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 11:26	1
Dichlorodifluoromethane	<3.00		3.00	0.250	ug/L			03/13/23 11:26	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 11:26	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 11:26	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 11:26	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 11:26	1
1,3-Dichloropropane	<1.00		1.00	0.400	ug/L			03/13/23 11:26	1
2,2-Dichloropropane	<4.00		4.00	0.690	ug/L			03/13/23 11:26	1
1,1-Dichloropropene	<1.00		1.00	0.430	ug/L			03/13/23 11:26	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 11:26	1
Ethyl methacrylate	<2.00		2.00	0.680	ug/L			03/13/23 11:26	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 11:26	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 11:26	1
Methacrylonitrile	<10.0		10.0	3.30	ug/L			03/13/23 11:26	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 11:26	1
Methyl methacrylate	<2.00		2.00	0.760	ug/L			03/13/23 11:26	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 11:26	1
Naphthalene	<5.00		5.00	3.00	ug/L			03/13/23 11:26	1
Propionitrile	<10.0		10.0	3.40	ug/L			03/13/23 11:26	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 11:26	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 11:26	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 11:26	1

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

Lab Sample ID: MB 310-381097/5
Matrix: Water
Analysis Batch: 381097

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 11:26	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 11:26	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 11:26	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 11:26	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 11:26	1
1,2,4-Trichlorobenzene	<5.00		5.00	0.750	ug/L			03/13/23 11:26	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 11:26	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 11:26	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 11:26	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 11:26	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 11:26	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 11:26	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 11:26	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 11:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/13/23 11:26*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 128*		*03/13/23 11:26*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 11:26*	*1*

Lab Sample ID: LCS 310-381097/6
Matrix: Water
Analysis Batch: 381097

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	40.39		ug/L		101	50 - 150
Acrolein	94.8	86.70		ug/L		91	12 - 150
Acrylonitrile	200	181.6		ug/L		91	50 - 150
Allyl chloride	20.0	17.53		ug/L		88	50 - 150
Benzene	20.0	17.50		ug/L		88	73 - 122
Bromochloromethane	20.0	19.13		ug/L		96	68 - 132
Bromodichloromethane	20.0	18.19		ug/L		91	72 - 121
Bromoform	20.0	14.34		ug/L		72	55 - 129
2-Butanone (MEK)	40.0	34.38		ug/L		86	50 - 150
Carbon disulfide	20.0	16.37		ug/L		82	58 - 131
Carbon tetrachloride	20.0	16.57		ug/L		83	67 - 132
Chlorobenzene	20.0	17.26		ug/L		86	69 - 121
Chlorodibromomethane	20.0	16.12		ug/L		81	69 - 122
Chloroform	20.0	18.82		ug/L		94	72 - 120
Chloroprene	20.0	20.47		ug/L		102	67 - 131
cis-1,2-Dichloroethene	20.0	18.73		ug/L		94	74 - 120
cis-1,3-Dichloropropene	20.0	16.64		ug/L		83	71 - 126
1,2-Dibromo-3-chloropropane	20.0	15.85		ug/L		79	50 - 150
1,2-Dibromoethane (EDB)	20.0	18.09		ug/L		90	73 - 125
Dibromomethane	20.0	19.16		ug/L		96	72 - 123
1,2-Dichlorobenzene	20.0	17.58		ug/L		88	68 - 120
1,3-Dichlorobenzene	20.0	17.49		ug/L		87	67 - 123

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

Lab Sample ID: LCS 310-381097/6
Matrix: Water
Analysis Batch: 381097

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	20.0	17.84		ug/L		89	67 - 120
1,1-Dichloroethane	20.0	18.09		ug/L		90	71 - 123
1,2-Dichloroethane	20.0	19.12		ug/L		96	70 - 124
1,1-Dichloroethene	20.0	17.71		ug/L		89	61 - 129
1,2-Dichloropropane	20.0	17.32		ug/L		87	73 - 121
1,3-Dichloropropane	20.0	17.39		ug/L		87	72 - 124
2,2-Dichloropropane	20.0	19.25		ug/L		96	50 - 150
1,1-Dichloropropene	20.0	16.98		ug/L		85	70 - 131
Ethylbenzene	20.0	17.68		ug/L		88	69 - 122
Ethyl methacrylate	20.0	17.10		ug/L		85	64 - 131
2-Hexanone	40.0	37.47		ug/L		94	60 - 132
Iodomethane	20.0	12.14		ug/L		61	10 - 150
Methacrylonitrile	200	193.5		ug/L		97	70 - 126
Methylene chloride	20.0	17.42		ug/L		87	50 - 150
Methyl methacrylate	40.0	36.46		ug/L		91	68 - 127
4-Methyl-2-pentanone (MIBK)	40.0	36.78		ug/L		92	62 - 130
Naphthalene	20.0	16.21		ug/L		81	50 - 150
Propionitrile	200	186.8		ug/L		93	66 - 125
Styrene	20.0	17.80		ug/L		89	67 - 125
1,1,1,2-Tetrachloroethane	20.0	15.68		ug/L		78	68 - 123
1,1,2,2-Tetrachloroethane	20.0	17.12		ug/L		86	64 - 124
Tetrachloroethene	20.0	17.35		ug/L		87	69 - 131
Toluene	20.0	17.90		ug/L		89	72 - 121
trans-1,4-Dichloro-2-butene	20.0	16.35		ug/L		82	48 - 150
trans-1,2-Dichloroethene	20.0	18.33		ug/L		92	68 - 125
trans-1,3-Dichloropropene	20.0	16.35		ug/L		82	68 - 124
1,2,4-Trichlorobenzene	20.0	16.36		ug/L		82	61 - 124
1,1,1-Trichloroethane	20.0	18.58		ug/L		93	71 - 128
1,1,2-Trichloroethane	20.0	17.21		ug/L		86	70 - 124
Trichloroethene	20.0	16.81		ug/L		84	73 - 126
1,2,3-Trichloropropane	20.0	17.43		ug/L		87	64 - 125
Vinyl acetate	40.0	32.55		ug/L		81	50 - 150
Xylenes, Total	40.0	34.24		ug/L		86	68 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 128*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCS 310-381097/7
Matrix: Water
Analysis Batch: 381097

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	17.80		ug/L		89	24 - 150
Chloroethane	20.0	18.00		ug/L		90	51 - 137
Chloromethane	20.0	16.80		ug/L		84	37 - 150

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

Lab Sample ID: LCS 310-381097/7
Matrix: Water
Analysis Batch: 381097

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Dichlorodifluoromethane	20.0	22.64		ug/L		113	37 - 150
Trichlorofluoromethane	20.0	22.74		ug/L		114	56 - 144
Vinyl chloride	20.0	19.13		ug/L		96	57 - 136

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 128*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: 310-251194-1 MS
Matrix: Ground Water
Analysis Batch: 381097

Client Sample ID: MW-15R
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	48.09		ug/L		96	35 - 150
Acrolein	<10.0		119	117.7		ug/L		99	10 - 150
Acrylonitrile	<5.00		250	215.1		ug/L		86	50 - 150
Allyl chloride	<2.00		25.0	20.19		ug/L		81	35 - 150
Benzene	<0.500		25.0	19.76		ug/L		79	47 - 130
Bromochloromethane	<5.00		25.0	22.55		ug/L		90	54 - 132
Bromodichloromethane	<1.00		25.0	21.60		ug/L		86	58 - 130
Bromoform	<5.00		25.0	16.88		ug/L		68	42 - 130
2-Butanone (MEK)	<10.0		50.0	40.32		ug/L		81	47 - 150
Carbon disulfide	<1.00		25.0	19.20		ug/L		77	39 - 131
Carbon tetrachloride	<2.00		25.0	17.76		ug/L		71	45 - 132
Chlorobenzene	<1.00		25.0	20.60		ug/L		82	54 - 130
Chlorodibromomethane	<5.00		25.0	19.47		ug/L		78	53 - 130
Chloroform	<3.00		25.0	21.68		ug/L		87	55 - 130
Chloroprene	<1.00		25.0	22.35		ug/L		89	47 - 131
cis-1,2-Dichloroethene	<1.00		25.0	21.63		ug/L		87	52 - 130
cis-1,3-Dichloropropene	<5.00		25.0	19.23		ug/L		77	55 - 130
1,2-Dibromo-3-chloropropane	<5.00		25.0	17.37		ug/L		69	45 - 150
1,2-Dibromoethane (EDB)	<1.00		25.0	21.79		ug/L		87	59 - 130
Dibromomethane	<1.00		25.0	22.99		ug/L		92	61 - 130
1,2-Dichlorobenzene	<1.00		25.0	20.27		ug/L		81	53 - 130
1,3-Dichlorobenzene	<1.00		25.0	20.74		ug/L		83	54 - 130
1,4-Dichlorobenzene	<1.00		25.0	20.26		ug/L		81	53 - 130
1,1-Dichloroethane	<1.00		25.0	20.83		ug/L		83	53 - 130
1,2-Dichloroethane	<1.00		25.0	22.92		ug/L		92	57 - 130
1,1-Dichloroethene	<2.00		25.0	20.56		ug/L		82	39 - 130
1,2-Dichloropropane	<1.00		25.0	20.32		ug/L		81	60 - 130
1,3-Dichloropropane	<1.00		25.0	21.28		ug/L		85	57 - 130
2,2-Dichloropropane	<4.00		25.0	19.73		ug/L		79	28 - 150
1,1-Dichloropropene	<1.00		25.0	18.86		ug/L		75	50 - 131
Ethylbenzene	<1.00		25.0	19.96		ug/L		80	48 - 130
Ethyl methacrylate	<2.00		25.0	21.41		ug/L		86	50 - 131
2-Hexanone	<10.0		50.0	44.33		ug/L		89	45 - 132

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

Lab Sample ID: 310-251194-1 MS
Matrix: Ground Water
Analysis Batch: 381097

Client Sample ID: MW-15R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iodomethane	<10.0		25.0	12.60		ug/L		50	10 - 150
Methacrylonitrile	<10.0		250	232.2		ug/L		93	57 - 130
Methylene chloride	<5.00		25.0	20.52		ug/L		82	50 - 150
Methyl methacrylate	<2.00		50.0	43.51		ug/L		87	50 - 131
4-Methyl-2-pentanone (MIBK)	<10.0		50.0	44.87		ug/L		90	46 - 132
Naphthalene	<5.00		25.0	19.17		ug/L		77	33 - 150
Propionitrile	<10.0		250	232.1		ug/L		93	53 - 130
Styrene	<1.00		25.0	21.55		ug/L		86	46 - 130
1,1,1,2-Tetrachloroethane	<1.00		25.0	18.06		ug/L		72	52 - 130
1,1,2,2-Tetrachloroethane	<1.00		25.0	20.94		ug/L		84	51 - 130
Tetrachloroethene	<1.00		25.0	18.88		ug/L		76	42 - 131
Toluene	<1.00		25.0	20.41		ug/L		82	48 - 130
trans-1,4-Dichloro-2-butene	<10.0		25.0	19.20		ug/L		77	33 - 150
trans-1,2-Dichloroethene	<1.00		25.0	21.57		ug/L		86	54 - 130
trans-1,3-Dichloropropene	<5.00		25.0	19.42		ug/L		78	51 - 130
1,2,4-Trichlorobenzene	<5.00		25.0	18.59		ug/L		74	45 - 130
1,1,1-Trichloroethane	<1.00		25.0	20.35		ug/L		81	49 - 130
1,1,2-Trichloroethane	<1.00		25.0	21.17		ug/L		85	56 - 130
Trichloroethene	<1.00		25.0	18.91		ug/L		76	55 - 130
1,2,3-Trichloropropane	<1.00		25.0	21.40		ug/L		86	50 - 130
Vinyl acetate	<10.0		50.0	34.85		ug/L		70	34 - 150
Xylenes, Total	<3.00		50.0	39.67		ug/L		79	44 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 128*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: 310-251194-1 MSD
Matrix: Ground Water
Analysis Batch: 381097

Client Sample ID: MW-15R
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	47.70		ug/L		95	35 - 150	1	26
Acrolein	<10.0		119	117.7		ug/L		99	10 - 150	0	27
Acrylonitrile	<5.00		250	216.6		ug/L		87	50 - 150	1	21
Allyl chloride	<2.00		25.0	20.40		ug/L		82	35 - 150	1	35
Benzene	<0.500		25.0	19.60		ug/L		78	47 - 130	1	20
Bromochloromethane	<5.00		25.0	22.20		ug/L		89	54 - 132	2	20
Bromodichloromethane	<1.00		25.0	21.83		ug/L		87	58 - 130	1	20
Bromoform	<5.00		25.0	17.71		ug/L		71	42 - 130	5	20
2-Butanone (MEK)	<10.0		50.0	40.59		ug/L		81	47 - 150	1	20
Carbon disulfide	<1.00		25.0	18.17		ug/L		73	39 - 131	5	32
Carbon tetrachloride	<2.00		25.0	17.67		ug/L		71	45 - 132	1	20
Chlorobenzene	<1.00		25.0	20.74		ug/L		83	54 - 130	1	20
Chlorodibromomethane	<5.00		25.0	20.15		ug/L		81	53 - 130	3	20
Chloroform	<3.00		25.0	21.28		ug/L		85	55 - 130	2	20

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

Lab Sample ID: 310-251194-1 MSD
Matrix: Ground Water
Analysis Batch: 381097

Client Sample ID: MW-15R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloroprene	<1.00		25.0	22.53		ug/L		90	47 - 131	1	20
cis-1,2-Dichloroethene	<1.00		25.0	21.53		ug/L		86	52 - 130	0	20
cis-1,3-Dichloropropene	<5.00		25.0	19.56		ug/L		78	55 - 130	2	20
1,2-Dibromo-3-chloropropane	<5.00		25.0	18.79		ug/L		75	45 - 150	8	20
1,2-Dibromoethane (EDB)	<1.00		25.0	22.16		ug/L		89	59 - 130	2	20
Dibromomethane	<1.00		25.0	22.71		ug/L		91	61 - 130	1	20
1,2-Dichlorobenzene	<1.00		25.0	21.11		ug/L		84	53 - 130	4	20
1,3-Dichlorobenzene	<1.00		25.0	21.26		ug/L		85	54 - 130	2	20
1,4-Dichlorobenzene	<1.00		25.0	21.07		ug/L		84	53 - 130	4	20
1,1-Dichloroethane	<1.00		25.0	20.51		ug/L		82	53 - 130	2	20
1,2-Dichloroethane	<1.00		25.0	22.57		ug/L		90	57 - 130	2	21
1,1-Dichloroethene	<2.00		25.0	19.69		ug/L		79	39 - 130	4	28
1,2-Dichloropropane	<1.00		25.0	20.29		ug/L		81	60 - 130	0	31
1,3-Dichloropropane	<1.00		25.0	21.85		ug/L		87	57 - 130	3	20
2,2-Dichloropropane	<4.00		25.0	19.29		ug/L		77	28 - 150	2	20
1,1-Dichloropropene	<1.00		25.0	18.48		ug/L		74	50 - 131	2	20
Ethylbenzene	<1.00		25.0	20.03		ug/L		80	48 - 130	0	20
Ethyl methacrylate	<2.00		25.0	21.99		ug/L		88	50 - 131	3	20
2-Hexanone	<10.0		50.0	47.58		ug/L		95	45 - 132	7	20
Iodomethane	<10.0		25.0	14.30		ug/L		57	10 - 150	13	35
Methacrylonitrile	<10.0		250	236.3		ug/L		95	57 - 130	2	20
Methylene chloride	<5.00		25.0	19.92		ug/L		80	50 - 150	3	24
Methyl methacrylate	<2.00		50.0	45.09		ug/L		90	50 - 131	4	20
4-Methyl-2-pentanone (MIBK)	<10.0		50.0	47.04		ug/L		94	46 - 132	5	20
Naphthalene	<5.00		25.0	20.13		ug/L		81	33 - 150	5	30
Propionitrile	<10.0		250	230.3		ug/L		92	53 - 130	1	20
Styrene	<1.00		25.0	21.54		ug/L		86	46 - 130	0	20
1,1,1,2-Tetrachloroethane	<1.00		25.0	18.85		ug/L		75	52 - 130	4	20
1,1,2,2-Tetrachloroethane	<1.00		25.0	22.08		ug/L		88	51 - 130	5	20
Tetrachloroethene	<1.00		25.0	18.65		ug/L		75	42 - 131	1	20
Toluene	<1.00		25.0	20.47		ug/L		82	48 - 130	0	20
trans-1,4-Dichloro-2-butene	<10.0		25.0	20.10		ug/L		80	33 - 150	5	20
trans-1,2-Dichloroethene	<1.00		25.0	20.07		ug/L		80	54 - 130	7	24
trans-1,3-Dichloropropene	<5.00		25.0	19.76		ug/L		79	51 - 130	2	20
1,2,4-Trichlorobenzene	<5.00		25.0	19.80		ug/L		79	45 - 130	6	20
1,1,1-Trichloroethane	<1.00		25.0	20.35		ug/L		81	49 - 130	0	20
1,1,2-Trichloroethane	<1.00		25.0	22.15		ug/L		89	56 - 130	5	20
Trichloroethene	<1.00		25.0	18.37		ug/L		73	55 - 130	3	20
1,2,3-Trichloropropane	<1.00		25.0	22.59		ug/L		90	50 - 130	5	20
Vinyl acetate	<10.0		50.0	36.37		ug/L		73	34 - 150	4	27
Xylenes, Total	<3.00		50.0	39.96		ug/L		80	44 - 130	1	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*
Dibromofluoromethane (Surr)	*99*		*80 - 128*
Toluene-d8 (Surr)	*100*		*80 - 120*

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 310-381115/1-A
Matrix: Water
Analysis Batch: 381339

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<10.0		10.0	0.640	ug/L		03/13/23 10:26	03/15/23 18:09	1
Acenaphthylene	<10.0		10.0	0.720	ug/L		03/13/23 10:26	03/15/23 18:09	1
Acetophenone	<10.0		10.0	0.690	ug/L		03/13/23 10:26	03/15/23 18:09	1
Anthracene	<10.0		10.0	0.870	ug/L		03/13/23 10:26	03/15/23 18:09	1
Benzo(a)anthracene	<10.0		10.0	0.850	ug/L		03/13/23 10:26	03/15/23 18:09	1
Benzo(a)pyrene	<10.0		10.0	8.10	ug/L		03/13/23 10:26	03/15/23 18:09	1
Benzo(b)fluoranthene	<10.0		10.0	4.90	ug/L		03/13/23 10:26	03/15/23 18:09	1
Benzo(g,h,i)perylene	<10.0		10.0	6.30	ug/L		03/13/23 10:26	03/15/23 18:09	1
Benzo(k)fluoranthene	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/15/23 18:09	1
Benzyl alcohol	<10.0		10.0	1.30	ug/L		03/13/23 10:26	03/15/23 18:09	1
Bis(2-chloroethoxy)methane	<10.0		10.0	0.760	ug/L		03/13/23 10:26	03/15/23 18:09	1
Bis(2-chloroethyl)ether	<10.0		10.0	0.820	ug/L		03/13/23 10:26	03/15/23 18:09	1
bis(2-chloroisopropyl) ether	<10.0		10.0	0.540	ug/L		03/13/23 10:26	03/15/23 18:09	1
Bis(2-ethylhexyl) phthalate	<10.0		10.0	5.50	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Bromophenyl phenyl ether	<10.0		10.0	0.700	ug/L		03/13/23 10:26	03/15/23 18:09	1
Butyl benzyl phthalate	<10.0		10.0	5.40	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Chloroaniline	<10.0		10.0	0.620	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Chloro-3-methylphenol	<10.0		10.0	0.840	ug/L		03/13/23 10:26	03/15/23 18:09	1
2-Chloronaphthalene	<10.0		10.0	0.640	ug/L		03/13/23 10:26	03/15/23 18:09	1
2-Chlorophenol	<10.0		10.0	0.540	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Chlorophenyl phenyl ether	<10.0		10.0	0.690	ug/L		03/13/23 10:26	03/15/23 18:09	1
Chrysene	<10.0		10.0	0.870	ug/L		03/13/23 10:26	03/15/23 18:09	1
Dibenz(a,h)anthracene	<10.0		10.0	3.90	ug/L		03/13/23 10:26	03/15/23 18:09	1
Dibenzofuran	<10.0		10.0	0.740	ug/L		03/13/23 10:26	03/15/23 18:09	1
3,3'-Dichlorobenzidine	<10.0		10.0	1.40	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,4-Dichlorophenol	<10.0		10.0	0.850	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,6-Dichlorophenol	<10.0		10.0	0.690	ug/L		03/13/23 10:26	03/15/23 18:09	1
Diethyl phthalate	<10.0		10.0	1.70	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,4-Dimethylphenol	<10.0		10.0	0.580	ug/L		03/13/23 10:26	03/15/23 18:09	1
Dimethyl phthalate	<10.0		10.0	1.00	ug/L		03/13/23 10:26	03/15/23 18:09	1
Di-n-butyl phthalate	<10.0		10.0	5.60	ug/L		03/13/23 10:26	03/15/23 18:09	1
1,3-Dinitrobenzene	<10.0		10.0	3.20	ug/L		03/13/23 10:26	03/15/23 18:09	1
4,6-Dinitro-2-methylphenol	<10.0		10.0	6.90	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,4-Dinitrophenol	<20.0		20.0	13.0	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,4-Dinitrotoluene	<10.0		10.0	6.40	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,6-Dinitrotoluene	<10.0		10.0	0.520	ug/L		03/13/23 10:26	03/15/23 18:09	1
Di-n-octyl phthalate	<20.0		20.0	7.00	ug/L		03/13/23 10:26	03/15/23 18:09	1
Diphenylamine	<10.0		10.0	6.00	ug/L		03/13/23 10:26	03/15/23 18:09	1
Fluoranthene	<10.0		10.0	1.70	ug/L		03/13/23 10:26	03/15/23 18:09	1
Fluorene	<10.0		10.0	0.790	ug/L		03/13/23 10:26	03/15/23 18:09	1
Hexachlorobenzene	<10.0		10.0	0.700	ug/L		03/13/23 10:26	03/15/23 18:09	1
Hexachlorobutadiene	<10.0		10.0	0.860	ug/L		03/13/23 10:26	03/15/23 18:09	1
Hexachlorocyclopentadiene	<10.0		10.0	5.10	ug/L		03/13/23 10:26	03/15/23 18:09	1
Hexachloroethane	<10.0		10.0	0.970	ug/L		03/13/23 10:26	03/15/23 18:09	1
Indeno(1,2,3-cd)pyrene	<10.0		10.0	4.20	ug/L		03/13/23 10:26	03/15/23 18:09	1
Isophorone	<10.0		10.0	0.930	ug/L		03/13/23 10:26	03/15/23 18:09	1
2-Methylnaphthalene	<10.0		10.0	0.590	ug/L		03/13/23 10:26	03/15/23 18:09	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 310-381115/1-A
Matrix: Water
Analysis Batch: 381339

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylphenol	<10.0		10.0	0.650	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Methylphenol (and/or 3-Methylphenol)	<10.0		10.0	0.700	ug/L		03/13/23 10:26	03/15/23 18:09	1
2-Nitroaniline	<10.0		10.0	5.90	ug/L		03/13/23 10:26	03/15/23 18:09	1
3-Nitroaniline	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Nitroaniline	<10.0		10.0	1.30	ug/L		03/13/23 10:26	03/15/23 18:09	1
Nitrobenzene	<10.0		10.0	0.800	ug/L		03/13/23 10:26	03/15/23 18:09	1
2-Nitrophenol	<10.0		10.0	6.80	ug/L		03/13/23 10:26	03/15/23 18:09	1
4-Nitrophenol	<10.0		10.0	7.60	ug/L		03/13/23 10:26	03/15/23 18:09	1
N-Nitrosodimethylamine	<10.0		10.0	0.720	ug/L		03/13/23 10:26	03/15/23 18:09	1
N-Nitrosodi-n-propylamine	<10.0		10.0	0.920	ug/L		03/13/23 10:26	03/15/23 18:09	1
N-Nitrosodiphenylamine	<10.0		10.0	0.750	ug/L		03/13/23 10:26	03/15/23 18:09	1
Pentachlorophenol	<10.0		10.0	9.60	ug/L		03/13/23 10:26	03/15/23 18:09	1
Phenanthrene	<10.0		10.0	0.790	ug/L		03/13/23 10:26	03/15/23 18:09	1
Phenol	<10.0		10.0	1.10	ug/L		03/13/23 10:26	03/15/23 18:09	1
Pyrene	<10.0		10.0	0.790	ug/L		03/13/23 10:26	03/15/23 18:09	1
1,2,4,5-Tetrachlorobenzene	<10.0		10.0	0.540	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,3,4,6-Tetrachlorophenol	<10.0		10.0	5.30	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,4,5-Trichlorophenol	<10.0		10.0	5.30	ug/L		03/13/23 10:26	03/15/23 18:09	1
2,4,6-Trichlorophenol	<10.0		10.0	5.00	ug/L		03/13/23 10:26	03/15/23 18:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl (Surr)	*69*		*28 - 110*	*03/13/23 10:26*	*03/15/23 18:09*	*1*
2-Fluorophenol (Surr)	*59*		*13 - 110*	*03/13/23 10:26*	*03/15/23 18:09*	*1*
Nitrobenzene-d5 (Surr)	*75*		*27 - 115*	*03/13/23 10:26*	*03/15/23 18:09*	*1*
Phenol-d5 (Surr)	*50*		*12 - 110*	*03/13/23 10:26*	*03/15/23 18:09*	*1*
Terphenyl-d14 (Surr)	*81*		*10 - 125*	*03/13/23 10:26*	*03/15/23 18:09*	*1*
2,4,6-Tribromophenol (Surr)	*61*		*15 - 121*	*03/13/23 10:26*	*03/15/23 18:09*	*1*

Lab Sample ID: MB 310-381115/1-A
Matrix: Water
Analysis Batch: 381447

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Acetylaminofluorene	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/16/23 10:52	1
4-Aminobiphenyl	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/16/23 10:52	1
Chlorobenzilate	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 10:52	1
Diallate	<10.0		10.0	4.00	ug/L		03/13/23 10:26	03/16/23 10:52	1
Dimethoate	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 10:52	1
7,12-Dimethylbenz(a)anthracene	<10.0		10.0	1.90	ug/L		03/13/23 10:26	03/16/23 10:52	1
3,3'-Dimethylbenzidine	<10.0		10.0	1.50	ug/L		03/13/23 10:26	03/16/23 10:52	1
Dinoseb	<10.0		10.0	2.40	ug/L		03/13/23 10:26	03/16/23 10:52	1
Disulfoton	<10.0		10.0	2.40	ug/L		03/13/23 10:26	03/16/23 10:52	1
Ethyl methanesulfonate	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 10:52	1
Ethyl parathion	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/16/23 10:52	1
Famphur	<10.0		10.0	3.80	ug/L		03/13/23 10:26	03/16/23 10:52	1
Hexachloropropene	<10.0		10.0	2.60	ug/L		03/13/23 10:26	03/16/23 10:52	1
Isodrin	<10.0		10.0	4.70	ug/L		03/13/23 10:26	03/16/23 10:52	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 310-381115/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381447 — **Prep Batch: 381115**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isosafrole	<10.0		10.0	2.30	ug/L		03/13/23 10:26	03/16/23 10:52	1
Kepone	<10.0		10.0	1.00	ug/L		03/13/23 10:26	03/16/23 10:52	1
Methapyrilene	<10.0		10.0	0.760	ug/L		03/13/23 10:26	03/16/23 10:52	1
3-Methylcholanthrene	<10.0		10.0	0.320	ug/L		03/13/23 10:26	03/16/23 10:52	1
Methyl methanesulfonate	<10.0		10.0	3.30	ug/L		03/13/23 10:26	03/16/23 10:52	1
Methyl parathion	<10.0		10.0	2.30	ug/L		03/13/23 10:26	03/16/23 10:52	1
1,4-Naphthoquinone	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 10:52	1
1-Naphthylamine	<10.0		10.0	2.50	ug/L		03/13/23 10:26	03/16/23 10:52	1
2-Naphthylamine	<10.0		10.0	2.10	ug/L		03/13/23 10:26	03/16/23 10:52	1
5-Nitro-o-toluidine	<10.0		10.0	2.80	ug/L		03/13/23 10:26	03/16/23 10:52	1
N-Nitrosodiethylamine	<10.0		10.0	3.40	ug/L		03/13/23 10:26	03/16/23 10:52	1
N-Nitrosodi-n-butylamine	<10.0		10.0	3.90	ug/L		03/13/23 10:26	03/16/23 10:52	1
N-Nitrosomethylethylamine	<10.0		10.0	4.90	ug/L		03/13/23 10:26	03/16/23 10:52	1
N-Nitrosopiperidine	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/16/23 10:52	1
N-Nitrosopyrrolidine	<10.0		10.0	3.60	ug/L		03/13/23 10:26	03/16/23 10:52	1
o,o',o''-Triethylphosphorothioate	<10.0		10.0	3.20	ug/L		03/13/23 10:26	03/16/23 10:52	1
o-Toluidine	<10.0		10.0	2.90	ug/L		03/13/23 10:26	03/16/23 10:52	1
p-Dimethylamino azobenzene	<10.0		10.0	2.20	ug/L		03/13/23 10:26	03/16/23 10:52	1
Pentachlorobenzene	<10.0		10.0	2.80	ug/L		03/13/23 10:26	03/16/23 10:52	1
Pentachloronitrobenzene	<10.0		10.0	5.80	ug/L		03/13/23 10:26	03/16/23 10:52	1
Phenacetin	<10.0		10.0	1.90	ug/L		03/13/23 10:26	03/16/23 10:52	1
1,4-Phenylenediamine	<10.0		10.0	1.90	ug/L		03/13/23 10:26	03/16/23 10:52	1
Phorate	<10.0		10.0	3.20	ug/L		03/13/23 10:26	03/16/23 10:52	1
Pronamide	<10.0		10.0	2.70	ug/L		03/13/23 10:26	03/16/23 10:52	1
Safrole	<10.0		10.0	2.80	ug/L		03/13/23 10:26	03/16/23 10:52	1
Thionazin	<10.0		10.0	3.50	ug/L		03/13/23 10:26	03/16/23 10:52	1
1,3,5-Trinitrobenzene	<10.0		10.0	2.30	ug/L		03/13/23 10:26	03/16/23 10:52	1

Lab Sample ID: LCS 310-381115/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381339 — **Prep Batch: 381115**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	100	81.49		ug/L		81	26 - 110
Acenaphthylene	100	84.55		ug/L		85	20 - 110
Acetophenone	100	84.54		ug/L		85	35 - 110
Anthracene	100	83.46		ug/L		83	30 - 113
Benzo(a)anthracene	100	92.22		ug/L		92	38 - 110
Benzo(a)pyrene	100	76.15		ug/L		76	15 - 126
Benzo(b)fluoranthene	100	81.07		ug/L		81	35 - 114
Benzo(g,h,i)perylene	100	87.92		ug/L		88	30 - 114
Benzo(k)fluoranthene	100	83.36		ug/L		83	39 - 111
Benzyl alcohol	100	76.59		ug/L		77	28 - 110
Bis(2-chloroethoxy)methane	100	85.25		ug/L		85	31 - 110
Bis(2-chloroethyl)ether	100	84.77		ug/L		85	30 - 110
bis(2-chloroisopropyl) ether	100	82.97		ug/L		83	27 - 110
Bis(2-ethylhexyl) phthalate	100	85.83		ug/L		86	29 - 126
4-Bromophenyl phenyl ether	100	83.10		ug/L		83	33 - 110

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-381115/2-A
Matrix: Water
Analysis Batch: 381339

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 381115

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Butyl benzyl phthalate	100	87.95		ug/L		88	31 - 121
4-Chloroaniline	100	34.13		ug/L		34	10 - 121
4-Chloro-3-methylphenol	100	90.67		ug/L		91	34 - 115
2-Chloronaphthalene	100	84.10		ug/L		84	24 - 110
2-Chlorophenol	100	81.53		ug/L		82	32 - 110
4-Chlorophenyl phenyl ether	100	82.84		ug/L		83	31 - 110
Chrysene	100	91.59		ug/L		92	40 - 110
Dibenz(a,h)anthracene	100	84.99		ug/L		85	31 - 122
Dibenzofuran	100	84.17		ug/L		84	31 - 110
2,4-Dichlorophenol	100	85.26		ug/L		85	31 - 110
2,6-Dichlorophenol	100	78.34		ug/L		78	24 - 112
Diethyl phthalate	100	83.93		ug/L		84	36 - 113
2,4-Dimethylphenol	100	92.07		ug/L		92	22 - 110
Dimethyl phthalate	100	89.28		ug/L		89	23 - 117
Di-n-butyl phthalate	100	92.31		ug/L		92	39 - 119
1,3-Dinitrobenzene	100	87.65		ug/L		88	29 - 119
4,6-Dinitro-2-methylphenol	200	169.4		ug/L		85	10 - 125
2,4-Dinitrophenol	200	164.6		ug/L		82	10 - 110
2,4-Dinitrotoluene	100	95.19		ug/L		95	36 - 115
2,6-Dinitrotoluene	100	92.70		ug/L		93	35 - 117
Di-n-octyl phthalate	100	78.99		ug/L		79	25 - 139
Diphenylamine	85.0	74.04		ug/L		87	22 - 119
Fluoranthene	100	86.81		ug/L		87	39 - 111
Fluorene	100	83.33		ug/L		83	32 - 110
Hexachlorobenzene	100	79.89		ug/L		80	35 - 110
Hexachlorobutadiene	100	58.08		ug/L		58	21 - 110
Hexachlorocyclopentadiene	100	74.80		ug/L		75	10 - 110
Hexachloroethane	100	62.30		ug/L		62	17 - 110
Indeno(1,2,3-cd)pyrene	100	84.04		ug/L		84	26 - 124
Isophorone	100	89.38		ug/L		89	33 - 111
2-Methylnaphthalene	100	66.89		ug/L		67	26 - 110
2-Methylphenol	100	84.93		ug/L		85	29 - 110
4-Methylphenol (and/or 3-Methylphenol)	100	84.88		ug/L		85	24 - 110
2-Nitroaniline	100	94.16		ug/L		94	33 - 115
3-Nitroaniline	100	87.78		ug/L		88	20 - 119
4-Nitroaniline	100	88.74		ug/L		89	18 - 118
Nitrobenzene	100	83.12		ug/L		83	31 - 110
2-Nitrophenol	100	89.96		ug/L		90	28 - 112
4-Nitrophenol	200	123.8		ug/L		62	10 - 110
N-Nitrosodimethylamine	100	72.31		ug/L		72	24 - 110
N-Nitrosodi-n-propylamine	100	91.74		ug/L		92	32 - 114
N-Nitrosodiphenylamine	100	87.10		ug/L		87	22 - 119
Pentachlorophenol	200	146.7		ug/L		73	10 - 116
Phenanthrene	100	82.23		ug/L		82	37 - 110
Phenol	100	59.21		ug/L		59	20 - 110
Pyrene	100	96.00		ug/L		96	35 - 115
1,2,4,5-Tetrachlorobenzene	100	72.29		ug/L		72	25 - 110

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-381115/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381339 — **Prep Batch: 381115**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,3,4,6-Tetrachlorophenol	100	89.46		ug/L		89	15 - 116
2,4,5-Trichlorophenol	100	95.56		ug/L		96	25 - 113
2,4,6-Trichlorophenol	100	94.76		ug/L		95	21 - 117

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*85*		*28 - 110*
2-Fluorophenol (Surr)	*73*		*13 - 110*
Nitrobenzene-d5 (Surr)	*86*		*27 - 115*
Phenol-d5 (Surr)	*61*		*12 - 110*
Terphenyl-d14 (Surr)	*95*		*10 - 125*
2,4,6-Tribromophenol (Surr)	*85*		*15 - 121*

Lab Sample ID: LCSD 310-381115/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381339 — **Prep Batch: 381115**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Acenaphthene	100	73.90		ug/L		74	26 - 110	10	35
Acenaphthylene	100	76.08		ug/L		76	20 - 110	11	35
Acetophenone	100	80.44		ug/L		80	35 - 110	5	35
Anthracene	100	75.80		ug/L		76	30 - 113	10	35
Benzo(a)anthracene	100	85.85		ug/L		86	38 - 110	7	35
Benzo(a)pyrene	100	70.12		ug/L		70	15 - 126	8	35
Benzo(b)fluoranthene	100	70.44		ug/L		70	35 - 114	14	35
Benzo(g,h,i)perylene	100	85.85		ug/L		86	30 - 114	2	35
Benzo(k)fluoranthene	100	72.89		ug/L		73	39 - 111	13	35
Benzyl alcohol	100	71.26		ug/L		71	28 - 110	7	35
Bis(2-chloroethoxy)methane	100	78.64		ug/L		79	31 - 110	8	35
Bis(2-chloroethyl)ether	100	81.48		ug/L		81	30 - 110	4	35
bis(2-chloroisopropyl) ether	100	76.43		ug/L		76	27 - 110	8	35
Bis(2-ethylhexyl) phthalate	100	80.90		ug/L		81	29 - 126	6	35
4-Bromophenyl phenyl ether	100	74.13		ug/L		74	33 - 110	11	35
Butyl benzyl phthalate	100	82.30		ug/L		82	31 - 121	7	35
4-Chloroaniline	100	80.20	*1	ug/L		80	10 - 121	81	35
4-Chloro-3-methylphenol	100	82.78		ug/L		83	34 - 115	9	35
2-Chloronaphthalene	100	74.97		ug/L		75	24 - 110	11	35
2-Chlorophenol	100	75.04		ug/L		75	32 - 110	8	35
4-Chlorophenyl phenyl ether	100	75.76		ug/L		76	31 - 110	9	35
Chrysene	100	86.32		ug/L		86	40 - 110	6	35
Dibenz(a,h)anthracene	100	82.77		ug/L		83	31 - 122	3	35
Dibenzofuran	100	77.78		ug/L		78	31 - 110	8	35
2,4-Dichlorophenol	100	77.66		ug/L		78	31 - 110	9	35
2,6-Dichlorophenol	100	72.56		ug/L		73	24 - 112	8	35
Diethyl phthalate	100	78.44		ug/L		78	36 - 113	7	35
2,4-Dimethylphenol	100	82.37		ug/L		82	22 - 110	11	35
Dimethyl phthalate	100	82.99		ug/L		83	23 - 117	7	35
Di-n-butyl phthalate	100	85.57		ug/L		86	39 - 119	8	35

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 310-381115/3-A
Matrix: Water
Analysis Batch: 381339

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 381115

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,3-Dinitrobenzene			100	83.21		ug/L		83	29 - 119	5	35
4,6-Dinitro-2-methylphenol			200	152.1		ug/L		76	10 - 125	11	35
2,4-Dinitrophenol			200	144.1		ug/L		72	10 - 110	13	35
2,4-Dinitrotoluene			100	89.01		ug/L		89	36 - 115	7	35
2,6-Dinitrotoluene			100	87.16		ug/L		87	35 - 117	6	35
Di-n-octyl phthalate			100	71.33		ug/L		71	25 - 139	10	35
Diphenylamine			85.0	68.07		ug/L		80	22 - 119	8	35
Fluoranthene			100	80.73		ug/L		81	39 - 111	7	35
Fluorene			100	75.80		ug/L		76	32 - 110	9	35
Hexachlorobenzene			100	73.11		ug/L		73	35 - 110	9	35
Hexachlorobutadiene			100	58.65		ug/L		59	21 - 110	1	35
Hexachlorocyclopentadiene			100	69.62		ug/L		70	10 - 110	7	35
Hexachloroethane			100	59.85		ug/L		60	17 - 110	4	35
Indeno(1,2,3-cd)pyrene			100	86.45		ug/L		86	26 - 124	3	35
Isophorone			100	81.84		ug/L		82	33 - 111	9	35
2-Methylnaphthalene			100	60.39		ug/L		60	26 - 110	10	35
2-Methylphenol			100	77.46		ug/L		77	29 - 110	9	35
4-Methylphenol (and/or 3-Methylphenol)			100	77.89		ug/L		78	24 - 110	9	35
2-Nitroaniline			100	87.91		ug/L		88	33 - 115	7	35
3-Nitroaniline			100	84.34		ug/L		84	20 - 119	4	35
4-Nitroaniline			100	85.02		ug/L		85	18 - 118	4	35
Nitrobenzene			100	75.32		ug/L		75	31 - 110	10	35
2-Nitrophenol			100	82.04		ug/L		82	28 - 112	9	35
4-Nitrophenol			200	113.5		ug/L		57	10 - 110	9	35
N-Nitrosodimethylamine			100	69.18		ug/L		69	24 - 110	4	35
N-Nitrosodi-n-propylamine			100	84.31		ug/L		84	32 - 114	8	35
N-Nitrosodiphenylamine			100	80.08		ug/L		80	22 - 119	8	35
Pentachlorophenol			200	121.1		ug/L		61	10 - 116	19	35
Phenanthrene			100	73.65		ug/L		74	37 - 110	11	35
Phenol			100	52.54		ug/L		53	20 - 110	12	35
Pyrene			100	86.03		ug/L		86	35 - 115	11	35
1,2,4,5-Tetrachlorobenzene			100	66.58		ug/L		67	25 - 110	8	35
2,3,4,6-Tetrachlorophenol			100	83.18		ug/L		83	15 - 116	7	35
2,4,5-Trichlorophenol			100	80.18		ug/L		80	25 - 113	18	35
2,4,6-Trichlorophenol			100	84.96		ug/L		85	21 - 117	11	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl (Surr)	*52*		*28 - 110*
2-Fluorophenol (Surr)	*46*		*13 - 110*
Nitrobenzene-d5 (Surr)	*56*		*27 - 115*
Phenol-d5 (Surr)	*39*		*12 - 110*
Terphenyl-d14 (Surr)	*59*		*10 - 125*
2,4,6-Tribromophenol (Surr)	*53*		*15 - 121*

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Lab Sample ID: MB 310-381284/4
Matrix: Water
Analysis Batch: 381284

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	0.570	mg/L			03/14/23 14:33	1
Isobutanol	<10.0		10.0	0.550	mg/L			03/14/23 14:33	1

Lab Sample ID: LCS 310-381284/10
Matrix: Water
Analysis Batch: 381284

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acetonitrile	26.0	29.41		mg/L		113	66 - 122
Isobutanol	27.0	28.73		mg/L		106	77 - 120

Lab Sample ID: LCSD 310-381284/11
Matrix: Water
Analysis Batch: 381284

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
Acetonitrile	26.0	28.85		mg/L		111	66 - 122	2	20
Isobutanol	27.0	28.71		mg/L		106	77 - 120	0	20

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 310-381117/1-A
Matrix: Water
Analysis Batch: 381454

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381117

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	<0.0640		0.0640	0.0320	ug/L		03/13/23 10:34	03/16/23 11:34	1
alpha-BHC	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 11:34	1
beta-BHC	<0.0640		0.0640	0.0370	ug/L		03/13/23 10:34	03/16/23 11:34	1
Chlordane (technical)	<2.00		2.00	0.810	ug/L		03/13/23 10:34	03/16/23 11:34	1
4,4'-DDD	<0.0640		0.0640	0.0270	ug/L		03/13/23 10:34	03/16/23 11:34	1
4,4'-DDE	<0.0640		0.0640	0.0270	ug/L		03/13/23 10:34	03/16/23 11:34	1
4,4'-DDT	<0.0640		0.0640	0.0420	ug/L		03/13/23 10:34	03/16/23 11:34	1
delta-BHC	<0.0640		0.0640	0.0270	ug/L		03/13/23 10:34	03/16/23 11:34	1
Dieldrin	<0.0640		0.0640	0.0260	ug/L		03/13/23 10:34	03/16/23 11:34	1
Endosulfan I	<0.0640		0.0640	0.0330	ug/L		03/13/23 10:34	03/16/23 11:34	1
Endosulfan II	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 11:34	1
Endosulfan sulfate	<0.0640		0.0640	0.0300	ug/L		03/13/23 10:34	03/16/23 11:34	1
Endrin	<0.0640		0.0640	0.0260	ug/L		03/13/23 10:34	03/16/23 11:34	1
Endrin aldehyde	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 11:34	1
gamma-BHC (Lindane)	<0.0640		0.0640	0.0360	ug/L		03/13/23 10:34	03/16/23 11:34	1
Heptachlor	<0.0640		0.0640	0.0330	ug/L		03/13/23 10:34	03/16/23 11:34	1
Heptachlor epoxide	<0.0640		0.0640	0.0290	ug/L		03/13/23 10:34	03/16/23 11:34	1
Methoxychlor	<0.0640		0.0640	0.0410	ug/L		03/13/23 10:34	03/16/23 11:34	1
Toxaphene	<2.00		2.00	0.690	ug/L		03/13/23 10:34	03/16/23 11:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*89*		*10 - 136*	*03/13/23 10:34*	*03/16/23 11:34*	*1*

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: MB 310-381117/1-A
Matrix: Water
Analysis Batch: 381454

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381117

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene	117		10 - 130	03/13/23 10:34	03/16/23 11:34	1

Lab Sample ID: LCS 310-381117/4-A
Matrix: Water
Analysis Batch: 382027

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 381117

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aldrin	1.00	0.5831		ug/L		58	13 - 120
alpha-BHC	1.00	0.6531		ug/L		65	36 - 127
beta-BHC	1.00	0.8242		ug/L		82	37 - 136
4,4'-DDD	1.00	0.7218		ug/L		72	36 - 149
4,4'-DDE	1.00	0.6601		ug/L		66	34 - 130
4,4'-DDT	1.00	0.6870		ug/L		69	23 - 150
delta-BHC	1.00	0.7439		ug/L		74	33 - 134
Dieldrin	1.00	0.7153		ug/L		72	39 - 130
Endosulfan I	1.00	0.6081		ug/L		61	10 - 120
Endosulfan II	1.00	0.6062		ug/L		61	14 - 120
Endosulfan sulfate	1.00	0.7749		ug/L		77	36 - 147
Endrin	1.00	0.6856		ug/L		69	39 - 140
Endrin aldehyde	1.00	0.6776		ug/L		68	32 - 137
gamma-BHC (Lindane)	1.00	0.6465		ug/L		65	36 - 132
Heptachlor	1.00	0.6516		ug/L		65	27 - 120
Heptachlor epoxide	1.00	0.6967		ug/L		70	38 - 133
Methoxychlor	1.00	0.6667		ug/L		67	10 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	48		10 - 136
Tetrachloro-m-xylene	60		10 - 130

Lab Sample ID: LCSD 310-381117/5-A
Matrix: Water
Analysis Batch: 382027

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 381117

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aldrin	1.00	0.6782		ug/L		68	13 - 120	15	35
alpha-BHC	1.00	0.7149		ug/L		71	36 - 127	9	35
beta-BHC	1.00	0.8716		ug/L		87	37 - 136	6	35
4,4'-DDD	1.00	0.7733		ug/L		77	36 - 149	7	35
4,4'-DDE	1.00	0.7079		ug/L		71	34 - 130	7	35
4,4'-DDT	1.00	0.7252		ug/L		73	23 - 150	5	35
delta-BHC	1.00	0.7858		ug/L		79	33 - 134	5	35
Dieldrin	1.00	0.7534		ug/L		75	39 - 130	5	35
Endosulfan I	1.00	0.6504		ug/L		65	10 - 120	7	35
Endosulfan II	1.00	0.6463		ug/L		65	14 - 120	6	35
Endosulfan sulfate	1.00	0.8204		ug/L		82	36 - 147	6	35
Endrin	1.00	0.7550		ug/L		76	39 - 140	10	35
Endrin aldehyde	1.00	0.7386		ug/L		74	32 - 137	9	35

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 310-381117/5-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 382027 — **Prep Batch: 381117**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
gamma-BHC (Lindane)			1.00	0.7213		ug/L		72	36 - 132	11	35
Heptachlor			1.00	0.7198		ug/L		72	27 - 120	10	35
Heptachlor epoxide			1.00	0.7636		ug/L		76	38 - 133	9	35
Methoxychlor			1.00	0.7428		ug/L		74	10 - 150	11	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*56*		*10 - 136*
Tetrachloro-m-xylene	*64*		*10 - 130*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 310-381117/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381452 — **Prep Batch: 381117**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 11:34	1
PCB-1221	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 11:34	1
PCB-1232	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 11:34	1
PCB-1242	<0.800		0.800	0.170	ug/L		03/13/23 10:34	03/16/23 11:34	1
PCB-1248	<0.800		0.800	0.110	ug/L		03/13/23 10:34	03/16/23 11:34	1
PCB-1254	<0.800		0.800	0.110	ug/L		03/13/23 10:34	03/16/23 11:34	1
PCB-1260	<0.800		0.800	0.110	ug/L		03/13/23 10:34	03/16/23 11:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*89*		*10 - 136*	*03/13/23 10:34*	*03/16/23 11:34*	*1*
Tetrachloro-m-xylene	*117*		*10 - 130*	*03/13/23 10:34*	*03/16/23 11:34*	*1*

Lab Sample ID: LCS 310-381117/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381452 — **Prep Batch: 381117**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016			10.0	11.56		ug/L		116	30 - 133		
PCB-1260			10.0	10.37		ug/L		104	31 - 133		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*68*		*10 - 136*
Tetrachloro-m-xylene	*100*		*10 - 130*

Lab Sample ID: LCSD 310-381117/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381452 — **Prep Batch: 381117**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016			10.0	9.043		ug/L		90	30 - 133	22	35
PCB-1260			10.0	8.522		ug/L		85	31 - 133	20	35

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCSD 310-381117/3-A
Matrix: Water
Analysis Batch: 381452

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 381117

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*57*		*10 - 136*
Tetrachloro-m-xylene	*86*		*10 - 130*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-381160/1-A
Matrix: Water
Analysis Batch: 381346

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381160

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/14/23 09:25	03/14/23 18:04	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/14/23 09:25	03/14/23 18:04	1
Barium	<0.00200		0.00200	0.000880	mg/L		03/14/23 09:25	03/14/23 18:04	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/14/23 09:25	03/14/23 18:04	1
Cadmium	<0.000100		0.000100	0.0000550	mg/L		03/14/23 09:25	03/14/23 18:04	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 18:04	1
Cobalt	<0.000500		0.000500	0.000190	mg/L		03/14/23 09:25	03/14/23 18:04	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/14/23 09:25	03/14/23 18:04	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/14/23 09:25	03/14/23 18:04	1
Nickel	<0.00500		0.00500	0.00190	mg/L		03/14/23 09:25	03/14/23 18:04	1
Selenium	<0.00500		0.00500	0.000960	mg/L		03/14/23 09:25	03/14/23 18:04	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/14/23 09:25	03/14/23 18:04	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/14/23 09:25	03/14/23 18:04	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/14/23 09:25	03/14/23 18:04	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/14/23 09:25	03/14/23 18:04	1
Tin	<5.00		5.00	3.00	ug/L		03/14/23 09:25	03/14/23 18:04	1

Lab Sample ID: LCS 310-381160/2-A
Matrix: Water
Analysis Batch: 381346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 381160

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2247		mg/L		112	80 - 120
Arsenic	0.200	0.2061		mg/L		103	80 - 120
Barium	0.100	0.1033		mg/L		103	80 - 120
Beryllium	0.100	0.1027		mg/L		103	80 - 120
Cadmium	0.100	0.1023		mg/L		102	80 - 120
Chromium	0.100	0.09929		mg/L		99	80 - 120
Cobalt	0.100	0.09965		mg/L		100	80 - 120
Copper	0.200	0.2294		mg/L		115	80 - 120
Lead	0.200	0.2087		mg/L		104	80 - 120
Nickel	0.200	0.2135		mg/L		107	80 - 120
Selenium	0.400	0.4069		mg/L		102	80 - 120
Silver	0.100	0.09902		mg/L		99	80 - 120
Thallium	0.200	0.1755		mg/L		88	80 - 120
Vanadium	0.100	0.09768		mg/L		98	80 - 120
Zinc	0.200	0.1987		mg/L		99	80 - 120
Tin	200	192.0		ug/L		96	80 - 120

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: 310-251194-6 DU — **Client Sample ID: MW-37R**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381346 — **Prep Batch: 381160**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	0.00153	J	0.001643	J	mg/L		7	20
Arsenic	0.000838	J	0.0008670	J	mg/L		3	20
Barium	0.863		0.8366		mg/L		3	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Cadmium	0.000186		0.0001840		mg/L		1	20
Chromium	<0.00500		0.001237	J	mg/L		NC	20
Cobalt	0.000690		0.0007420		mg/L		7	20
Copper	<0.00500		<0.00500		mg/L		NC	20
Lead	0.00159		0.001622		mg/L		2	20
Nickel	0.00366	J	0.003546	J	mg/L		3	20
Selenium	0.0201		0.02013		mg/L		0.2	20
Silver	<0.00100		<0.00100		mg/L		NC	20
Thallium	<0.00100		<0.00100		mg/L		NC	20
Vanadium	0.00272	J	0.003023	J	mg/L		11	20
Zinc	<0.0200		<0.0200		mg/L		NC	20
Tin	<0.00500		<5.00		ug/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-381409/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381521 — **Prep Batch: 381409**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		03/15/23 14:54	03/16/23 14:26	1

Lab Sample ID: LCS 310-381409/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381521 — **Prep Batch: 381409**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001729		mg/L		104	80 - 120

Method: 9012B - Cyanide, Total andor Amenable

Lab Sample ID: MB 310-381256/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381533 — **Prep Batch: 381256**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0100		0.0100	0.00430	mg/L		03/14/23 10:19	03/16/23 22:43	1

Lab Sample ID: LCS 310-381256/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381533 — **Prep Batch: 381256**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.200	0.1893		mg/L		95	90 - 110

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 500-702555/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 702558 — **Prep Batch: 702555**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	0.2720	J	1.00	0.231	mg/L		03/14/23 18:00	03/15/23 04:16	1

Lab Sample ID: LCS 500-702555/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 702558 — **Prep Batch: 702555**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	2.73	3.136		mg/L		115	80 - 120

Lab Sample ID: 310-251194-2 MS — **Client Sample ID: MW-19**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 702558 — **Prep Batch: 702555**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	<1.00		6.83	7.800		mg/L		114	75 - 125

Lab Sample ID: 310-251194-2 MSD — **Client Sample ID: MW-19**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 702558 — **Prep Batch: 702555**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfide	<1.00		6.83	8.120		mg/L		119	75 - 125	4	20

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-381175/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381175

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			03/13/23 14:52	1

Lab Sample ID: LCS 310-381175/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381175

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	116.0		mg/L		116	75 - 116

Lab Sample ID: 310-251194-3 DU — **Client Sample ID: MW-20**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381175

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	114		110.0		mg/L		4	35

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: MB 310-381206/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381206

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			03/14/23 07:04	1

Lab Sample ID: LCS 310-381206/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381206

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	115.0		mg/L		115	75 - 116

Method: 2,4,5-T ONLY - SW846 8151 Herbicide

Lab Sample ID: 1GC0901-BLK1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 1GC0901 — **Prep Batch: 1GC0901_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	<0.5		0.5		ug/L		03/16/23 08:11	03/21/23 13:59	1
2,4,5-TP (Silvex)	<0.5		0.5		ug/L		03/16/23 08:11	03/21/23 13:59	1
2,4-D	<2.0		2.0		ug/L		03/16/23 08:11	03/21/23 13:59	1
Dinoseb	<0.5		0.5		ug/L		03/16/23 08:11	03/21/23 13:59	1

Surrogate	*Blank %Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,5-Dichlorobenzoic Acid	*104*		*31 - 116*	*03/16/23 08:11*	*03/21/23 13:59*	*1*

Lab Sample ID: 1GC0901-BS1 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 1GC0901 — **Prep Batch: 1GC0901_P**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4,5-T	0.575000	0.57		ug/L		99.1	54 - 149
2,4,5-TP (Silvex)	0.575000	0.63		ug/L		110	35 - 141
2,4-D	1.15000	<2.0		ug/L		95.2	16 - 161
Dinoseb	1.15000	0.66		ug/L		57.4	10 - 133

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,5-Dichlorobenzoic Acid	*117*	*S-07*	*31 - 116*

Lab Sample ID: 1GC0901-SRM1 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 1GC0901 — **Prep Batch: 1GC0901_P**

Analyte	Spike Added	Reference Result	Reference Qualifier	Unit	D	%Rec	%Rec Limits
2,4,5-T	0.575000	0.61		ug/L		106	80 - 120
2,4,5-TP (Silvex)	0.575000	0.64		ug/L		112	80 - 120
2,4-D	1.15000	<2.0		ug/L		103	80 - 120
Dinoseb	1.15000	0.80	QR-06	ug/L		70.0	80 - 120

Method: 2,4,5-T ONLY - SW846 8151 Herbicide (Continued)

Lab Sample ID: 1GC0901-SRM1
Matrix: Water
Analysis Batch: 1GC0901

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 1GC0901_P

Surrogate	*Reference %Recovery*	*Reference Qualifier*	*Limits*
2,5-Dichlorobenzoic Acid	*116*		*31 - 116*

Lab Sample ID: 1GC0901-MS1
Matrix: Water
Analysis Batch: 1GC0901

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 1GC0901_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec Limits
2,4,5-T	<25.0		28.7500	27.75		ug/L	☼	96.5	50 - 123
2,4,5-TP (Silvex)	<25.0		28.7500	30.75		ug/L	☼	107	50 - 129
2,4-D	<100		57.5000	<100		ug/L	☼	104	50 - 131
Dinoseb	<25.0		57.5000	48.00		ug/L	☼	83.5	50 - 138

Surrogate	*Matrix Spike %Recovery*	*Matrix Spike Qualifier*	*Limits*
2,5-Dichlorobenzoic Acid	*110*		*31 - 116*

Lab Sample ID: 1GC0901-MSD1
Matrix: Water
Analysis Batch: 1GC0901

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 1GC0901_P

Analyte	Sample Result	Sample Qualifier	Spike Added	ix Spike Dup Result	Matrix Spike D Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4,5-T	<25.0		28.7500	27.50		ug/L	☼	95.7	50 - 123	0.905	30
2,4,5-TP (Silvex)	<25.0		28.7500	31.00		ug/L	☼	108	50 - 129	0.810	30
2,4-D	<100		57.5000	<100		ug/L	☼	88.7	50 - 131	15.8	30
Dinoseb	<25.0		57.5000	43.25		ug/L	☼	75.2	50 - 138	10.4	30

Surrogate	*atrix Spike Dup %Recovery*	*Matrix Spike Du Qualifier*	*Limits*
2,5-Dichlorobenzoic Acid	*110*		*31 - 116*

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

GC/MS VOA

Analysis Batch: 381097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-1	MW-15R	Total/NA	Ground Water	8260D	
310-251194-2	MW-19	Total/NA	Ground Water	8260D	
310-251194-3	MW-20	Total/NA	Ground Water	8260D	
310-251194-4	MW-21	Total/NA	Ground Water	8260D	
310-251194-5	MW-24	Total/NA	Ground Water	8260D	
310-251194-6	MW-37R	Total/NA	Ground Water	8260D	
310-251194-7	MW-38R	Total/NA	Ground Water	8260D	
310-251194-8	MW-39	Total/NA	Ground Water	8260D	
310-251194-9	MW-43	Total/NA	Ground Water	8260D	
310-251194-10	UD-0	Total/NA	Ground Water	8260D	
310-251194-11	MW-DWT	Total/NA	Ground Water	8260D	
310-251194-12	Trip Blank 1	Total/NA	Water	8260D	
310-251194-13	Trip Blank 2	Total/NA	Water	8260D	
MB 310-381097/5	Method Blank	Total/NA	Water	8260D	
LCS 310-381097/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-381097/7	Lab Control Sample	Total/NA	Water	8260D	
310-251194-1 MS	MW-15R	Total/NA	Ground Water	8260D	
310-251194-1 MSD	MW-15R	Total/NA	Ground Water	8260D	

GC/MS Semi VOA

Prep Batch: 381115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	3510C	
MB 310-381115/1-A	Method Blank	Total/NA	Water	3510C	
LCS 310-381115/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 310-381115/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 381339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	8270E	381115
MB 310-381115/1-A	Method Blank	Total/NA	Water	8270E	381115
LCS 310-381115/2-A	Lab Control Sample	Total/NA	Water	8270E	381115
LCSD 310-381115/3-A	Lab Control Sample Dup	Total/NA	Water	8270E	381115

Analysis Batch: 381447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	8270E	381115
MB 310-381115/1-A	Method Blank	Total/NA	Water	8270E	381115

GC Semi VOA

Prep Batch: 381117

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-2	MW-19	Total/NA	Ground Water	3510C	
310-251194-3	MW-20	Total/NA	Ground Water	3510C	
310-251194-5	MW-24	Total/NA	Ground Water	3510C	
MB 310-381117/1-A	Method Blank	Total/NA	Water	3510C	
LCS 310-381117/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCS 310-381117/4-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 310-381117/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

GC Semi VOA (Continued)

Prep Batch: 381117 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 310-381117/5-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 381284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	8015C	
MB 310-381284/4	Method Blank	Total/NA	Water	8015C	
LCS 310-381284/10	Lab Control Sample	Total/NA	Water	8015C	
LCSD 310-381284/11	Lab Control Sample Dup	Total/NA	Water	8015C	

Analysis Batch: 381452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	8082A	381117
MB 310-381117/1-A	Method Blank	Total/NA	Water	8082A	381117
LCS 310-381117/2-A	Lab Control Sample	Total/NA	Water	8082A	381117
LCSD 310-381117/3-A	Lab Control Sample Dup	Total/NA	Water	8082A	381117

Analysis Batch: 381454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-2	MW-19	Total/NA	Ground Water	8081B	381117
310-251194-3	MW-20	Total/NA	Ground Water	8081B	381117
310-251194-5	MW-24	Total/NA	Ground Water	8081B	381117
MB 310-381117/1-A	Method Blank	Total/NA	Water	8081B	381117

Analysis Batch: 382027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-381117/4-A	Lab Control Sample	Total/NA	Water	8081B	381117
LCSD 310-381117/5-A	Lab Control Sample Dup	Total/NA	Water	8081B	381117

Metals

Prep Batch: 381160

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-1	MW-15R	Total/NA	Ground Water	3005A	
310-251194-2	MW-19	Total/NA	Ground Water	3005A	
310-251194-3	MW-20	Total/NA	Ground Water	3005A	
310-251194-4	MW-21	Total/NA	Ground Water	3005A	
310-251194-5	MW-24	Total/NA	Ground Water	3005A	
310-251194-6	MW-37R	Total/NA	Ground Water	3005A	
310-251194-7	MW-38R	Total/NA	Ground Water	3005A	
310-251194-8	MW-39	Total/NA	Ground Water	3005A	
310-251194-9	MW-43	Total/NA	Ground Water	3005A	
310-251194-10	UD-0	Total/NA	Ground Water	3005A	
310-251194-11	MW-DWT	Total/NA	Ground Water	3005A	
MB 310-381160/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-381160/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-251194-6 DU	MW-37R	Total/NA	Ground Water	3005A	

Analysis Batch: 381346

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-1	MW-15R	Total/NA	Ground Water	6020B	381160

Metals (Continued)

Analysis Batch: 381346 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-2	MW-19	Total/NA	Ground Water	6020B	381160
310-251194-3	MW-20	Total/NA	Ground Water	6020B	381160
310-251194-4	MW-21	Total/NA	Ground Water	6020B	381160
310-251194-5	MW-24	Total/NA	Ground Water	6020B	381160
310-251194-6	MW-37R	Total/NA	Ground Water	6020B	381160
310-251194-7	MW-38R	Total/NA	Ground Water	6020B	381160
310-251194-8	MW-39	Total/NA	Ground Water	6020B	381160
310-251194-9	MW-43	Total/NA	Ground Water	6020B	381160
310-251194-10	UD-0	Total/NA	Ground Water	6020B	381160
310-251194-11	MW-DWT	Total/NA	Ground Water	6020B	381160
MB 310-381160/1-A	Method Blank	Total/NA	Water	6020B	381160
LCS 310-381160/2-A	Lab Control Sample	Total/NA	Water	6020B	381160
310-251194-6 DU	MW-37R	Total/NA	Ground Water	6020B	381160

Analysis Batch: 381386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-3	MW-20	Total/NA	Ground Water	6020B	381160

Prep Batch: 381409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	7470A	
MB 310-381409/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-381409/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 381521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	7470A	381409
MB 310-381409/1-A	Method Blank	Total/NA	Water	7470A	381409
LCS 310-381409/2-A	Lab Control Sample	Total/NA	Water	7470A	381409

General Chemistry

Analysis Batch: 381175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-2	MW-19	Total/NA	Ground Water	I-3765-85	
310-251194-3	MW-20	Total/NA	Ground Water	I-3765-85	
310-251194-9	MW-43	Total/NA	Ground Water	I-3765-85	
MB 310-381175/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-381175/2	Lab Control Sample	Total/NA	Water	I-3765-85	
310-251194-3 DU	MW-20	Total/NA	Ground Water	I-3765-85	

Analysis Batch: 381206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-1	MW-15R	Total/NA	Ground Water	I-3765-85	
310-251194-4	MW-21	Total/NA	Ground Water	I-3765-85	
310-251194-5	MW-24	Total/NA	Ground Water	I-3765-85	
310-251194-6	MW-37R	Total/NA	Ground Water	I-3765-85	
310-251194-7	MW-38R	Total/NA	Ground Water	I-3765-85	
310-251194-8	MW-39	Total/NA	Ground Water	I-3765-85	
310-251194-10	UD-0	Total/NA	Ground Water	I-3765-85	

General Chemistry (Continued)

Analysis Batch: 381206 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-11	MW-DWT	Total/NA	Ground Water	I-3765-85	
MB 310-381206/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-381206/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Prep Batch: 381256

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	9012B	
MB 310-381256/1-A	Method Blank	Total/NA	Water	9012B	
LCS 310-381256/2-A	Lab Control Sample	Total/NA	Water	9012B	

Analysis Batch: 381533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-5	MW-24	Total/NA	Ground Water	9012B	381256
MB 310-381256/1-A	Method Blank	Total/NA	Water	9012B	381256
LCS 310-381256/2-A	Lab Control Sample	Total/NA	Water	9012B	381256

Prep Batch: 702555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-2	MW-19	Total/NA	Ground Water	9030B	
310-251194-3	MW-20	Total/NA	Ground Water	9030B	
310-251194-4	MW-21	Total/NA	Ground Water	9030B	
310-251194-5	MW-24	Total/NA	Ground Water	9030B	
MB 500-702555/1-A	Method Blank	Total/NA	Water	9030B	
LCS 500-702555/2-A	Lab Control Sample	Total/NA	Water	9030B	
310-251194-2 MS	MW-19	Total/NA	Ground Water	9030B	
310-251194-2 MSD	MW-19	Total/NA	Ground Water	9030B	

Analysis Batch: 702558

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-2	MW-19	Total/NA	Ground Water	9034	702555
310-251194-3	MW-20	Total/NA	Ground Water	9034	702555
310-251194-4	MW-21	Total/NA	Ground Water	9034	702555
310-251194-5	MW-24	Total/NA	Ground Water	9034	702555
MB 500-702555/1-A	Method Blank	Total/NA	Water	9034	702555
LCS 500-702555/2-A	Lab Control Sample	Total/NA	Water	9034	702555
310-251194-2 MS	MW-19	Total/NA	Ground Water	9034	702555
310-251194-2 MSD	MW-19	Total/NA	Ground Water	9034	702555

Subcontract

Analysis Batch: 1GC0901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-3	MW-20	Total/NA	Ground Water	2,4,5-T ONLY	1GC0901_P
310-251194-5	MW-24	Total/NA	Ground Water	2,4-D/2,4,5-T/2,4,5-TP	1GC0901_P
1GC0901-BLK1	Method Blank	Total/NA	Water	2,4,5-T ONLY	1GC0901_P
1GC0901-BS1	Lab Control Sample	Total/NA	Water	2,4,5-T ONLY	1GC0901_P
1GC0901-SRM1	Lab Control Sample	Total/NA	Water	2,4,5-T ONLY	1GC0901_P
1GC0901-MS1	Matrix Spike	Total/NA	Water	2,4,5-T ONLY	1GC0901_P
1GC0901-MSD1	Matrix Spike Duplicate	Total/NA	Water	2,4,5-T ONLY	1GC0901_P

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Subcontract

Prep Batch: 1GC0901_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251194-3	MW-20	Total/NA	Ground Water	EPA 8151A	
310-251194-5	MW-24	Total/NA	Ground Water	EPA 8151A	
1GC0901-BLK1	Method Blank	Total/NA	Water	EPA 8151A	
1GC0901-BS1	Lab Control Sample	Total/NA	Water	EPA 8151A	
1GC0901-SRM1	Lab Control Sample	Total/NA	Water	EPA 8151A	
1GC0901-MS1	Matrix Spike	Total/NA	Water	EPA 8151A	
1GC0901-MSD1	Matrix Spike Duplicate	Total/NA	Water	EPA 8151A	

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-15R
Date Collected: 03/09/23 12:31
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-1
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 13:55
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 20:28
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-19
Date Collected: 03/09/23 17:50
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-2
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 14:17
Total/NA	Prep	3510C			381117	Y6AF	EET CF	03/13/23 10:34
Total/NA	Analysis	8081B		1	381454	BW2O	EET CF	03/16/23 13:40
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 20:31
Total/NA	Prep	9030B			702555	CLB	EET CHI	03/14/23 18:05 - 03/14/23 18:08 [1]
Total/NA	Analysis	9034		1	702558	CLB	EET CHI	03/15/23 04:29 - 03/15/23 04:35 [1]
Total/NA	Analysis	I-3765-85		1	381175	D7CP	EET CF	03/13/23 14:52

Client Sample ID: MW-20
Date Collected: 03/09/23 17:01
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-3
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 18:34
Total/NA	Prep	3510C			381117	Y6AF	EET CF	03/13/23 10:34
Total/NA	Analysis	8081B		1	381454	BW2O	EET CF	03/16/23 13:53
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 20:33
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		4	381386	A6US	EET CF	03/15/23 12:17
Total/NA	Prep	9030B			702555	CLB	EET CHI	03/14/23 18:13 - 03/14/23 18:16 [1]
Total/NA	Analysis	9034		1	702558	CLB	EET CHI	03/15/23 04:49 - 03/15/23 04:55 [1]
Total/NA	Analysis	I-3765-85		1	381175	D7CP	EET CF	03/13/23 14:52
Total/NA	Prep	EPA 8151A		1	1GC0901_P		SC0005	03/16/23 08:11
Total/NA	Analysis	2,4,5-T ONLY		1	1GC0901	EPP	SC0005	03/21/23 18:53

Client Sample ID: MW-21
Date Collected: 03/09/23 14:32
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-4
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 14:38

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-21
Date Collected: 03/09/23 14:32
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-4
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 20:36
Total/NA	Prep	9030B			702555	CLB	EET CHI	03/14/23 18:16 - 03/14/23 18:19 [1]
Total/NA	Analysis	9034		1	702558	CLB	EET CHI	03/15/23 04:55 - 03/15/23 05:02 [1]
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-24
Date Collected: 03/09/23 16:02
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-5
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 15:00
Total/NA	Prep	3510C			381115	Y6AF	EET CF	03/13/23 10:26
Total/NA	Analysis	8270E		1	381447	L0FS	EET CF	03/16/23 11:17
Total/NA	Prep	3510C			381115	Y6AF	EET CF	03/13/23 10:26
Total/NA	Analysis	8270E		1	381339	L0FS	EET CF	03/15/23 19:29
Total/NA	Analysis	8015C		1	381284	D2YP	EET CF	03/14/23 20:07
Total/NA	Prep	3510C			381117	Y6AF	EET CF	03/13/23 10:34
Total/NA	Analysis	8081B		1	381454	BW2O	EET CF	03/16/23 14:06
Total/NA	Prep	3510C			381117	Y6AF	EET CF	03/13/23 10:34
Total/NA	Analysis	8082A		1	381452	BW2O	EET CF	03/16/23 14:06
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 20:39
Total/NA	Prep	7470A			381409	XXW3	EET CF	03/15/23 14:54
Total/NA	Analysis	7470A		1	381521	XXW3	EET CF	03/16/23 14:39
Total/NA	Prep	9012B			381256	ENB7	EET CF	03/14/23 10:19
Total/NA	Analysis	9012B		1	381533	ZJX4	EET CF	03/16/23 22:51
Total/NA	Prep	9030B			702555	CLB	EET CHI	03/14/23 18:19 - 03/14/23 18:21 [1]
Total/NA	Analysis	9034		1	702558	CLB	EET CHI	03/15/23 05:02 - 03/15/23 05:09 [1]
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04
Total/NA	Prep	EPA 8151A		1	1GC0901_P		SC0005	03/16/23 08:11
Total/NA	Analysis	2,4-D/2,4,5-T/2,4,5-TP		1	1GC0901	EPP	SC0005	03/21/23 19:26

Client Sample ID: MW-37R
Date Collected: 03/09/23 15:15
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251194-6
Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 18:55
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 20:42
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: MW-38R
Lab Sample ID: 310-251194-7
Date Collected: 03/10/23 10:49
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 15:21
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 21:08
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-39
Lab Sample ID: 310-251194-8
Date Collected: 03/09/23 11:19
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 15:42
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 21:11
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-43
Lab Sample ID: 310-251194-9
Date Collected: 03/08/23 15:16
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 16:04
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 21:14
Total/NA	Analysis	I-3765-85		1	381175	D7CP	EET CF	03/13/23 14:52

Client Sample ID: UD-0
Lab Sample ID: 310-251194-10
Date Collected: 03/10/23 09:20
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 19:16
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 21:17
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-DWT
Lab Sample ID: 310-251194-11
Date Collected: 03/09/23 17:50
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 16:25
Total/NA	Prep	3005A			381160	QTZ5	EET CF	03/14/23 09:25
Total/NA	Analysis	6020B		1	381346	A6US	EET CF	03/14/23 21:19
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Client Sample ID: Trip Blank 1

Lab Sample ID: 310-251194-12
Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 12:30

Client Sample ID: Trip Blank 2

Lab Sample ID: 310-251194-13
Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 12:51

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200
SC0005 = Keystone Laboratories, Inc, 600 East 17th Street South, Newton, IA 50208

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	04-12-23

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

Analysis Method	Prep Method	Matrix	Analyte
8260D		Ground Water	1,2,4-Trichlorobenzene
8260D		Ground Water	Allyl chloride
8260D		Ground Water	Ethyl methacrylate
8260D		Water	1,2,4-Trichlorobenzene
8260D		Water	Allyl chloride
8260D		Water	Ethyl methacrylate

Laboratory: Eurofins Chicago

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	082	05-01-24

Method Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill(Spring 2023 WT HMSP)

Job ID: 310-251194-1
SDG: 27223098 Task1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	EET CF
8015C	Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)	SW846	EET CF
8081B	Organochlorine Pesticides (GC)	SW846	EET CF
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
9012B	Cyanide, Total andor Amenable	SW846	EET CF
9034	Sulfide, Acid soluble and Insoluble (Titrimetric)	SW846	EET CHI
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
8151	SW846 8151 Herbicide	SW846	SC0005
3005A	Preparation, Total Metals	SW846	EET CF
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET CF
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	SW846	EET CHI

Protocol References:

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:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200
SC0005 = Keystone Laboratories, Inc, 600 East 17th Street South, Newton, IA 50208

ANALYTICAL REPORT

March 22, 2023

Work Order: 1GC1313

Report To	Work Order Information
Shirley Thompson	Date Received: 3/13/2023 12:00:00PM
Eurofins Test America, Cedar Falls	Collector: unknown
3019 Venture Way	Phone: (319) 277-2401
Cedar Falls, IA 50613	PO Number: US1702520285

Project: Subcontract - ST

Project Number: 31002404

CASE NARRATIVE

The samples received on 03/13/23 12:00 for Work Order 1GC1313 were contained in client supplied containers.

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1GC1313-01 MW-20 (310-251194-3)				Matrix: Water		Collected: 03/09/23 17:01	
2,4,5-T	<0.5 ug/L	0.5	1GC0901	EPA 8151A	EPP	03/21/23 18:53	
Surrogate: 2,5-Dichlorobenzoic Acid	*110 %*			*31-116*	EPP	03/21/23 18:53	
1GC1313-02 MW-24 (310-251194-5)				Matrix: Water		Collected: 03/09/23 16:02	
2,4-D	<2.0 ug/L	2.0	1GC0901	EPA 8151A	EPP	03/21/23 19:26	
2,4,5-TP (Silvex)	<0.5 ug/L	0.5	1GC0901	EPA 8151A	EPP	03/21/23 19:26	
2,4,5-T	<0.5 ug/L	0.5	1GC0901	EPA 8151A	EPP	03/21/23 19:26	
Surrogate: 2,5-Dichlorobenzoic Acid	*108 %*			*31-116*	EPP	03/21/23 19:26	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

Eurofins Test America, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613

Work Order: 1GC1313

Determination of Chlorinated Phenoxy Herbicides - Quality Control

Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GC0901 - EPA 8151A										
Blank (1GC0901-BLK1)				Prepared: 03/16/23 Analyzed: 03/21/23						
Surrogate: 2,5-Dichlorobenzoic Acid	*2.65*		*ug/L*	*2.55000*		*104*	*31-116*			
2,4-D	ND	2.0	"							
2,4,5-TP (Silvex)	ND	0.5	"							
2,4,5-T	ND	0.5	"							
Dinoseb	ND	0.5	"							
LCS (1GC0901-BS1)				Prepared: 03/16/23 Analyzed: 03/21/23						
Surrogate: 2,5-Dichlorobenzoic Acid	*2.98*		*ug/L*	*2.55000*		*117*	*31-116*			*S-07*
2,4-D	1.10	2.0	"	1.15000		95.2	16-161			
2,4,5-TP (Silvex)	0.63	0.5	"	0.575000		110	35-141			
2,4,5-T	0.57	0.5	"	0.575000		99.1	54-149			
Dinoseb	0.66	0.5	"	1.15000		57.4	10-133			
Matrix Spike (1GC0901-MS1)		**Source: 1GC1048-03**		Prepared: 03/16/23 Analyzed: 03/21/23						
Surrogate: 2,5-Dichlorobenzoic Acid	*141*		*ug/L*	*127.500*		*110*	*31-116*			
2,4-D	59.75	100	"	57.5000	ND	104	50-131			
2,4,5-TP (Silvex)	30.75	25.0	"	28.7500	ND	107	50-129			
2,4,5-T	27.75	25.0	"	28.7500	ND	96.5	50-123			
Dinoseb	48.00	25.0	"	57.5000	ND	83.5	50-138			
Matrix Spike Dup (1GC0901-MSD1)		**Source: 1GC1048-03**		Prepared: 03/16/23 Analyzed: 03/21/23						
Surrogate: 2,5-Dichlorobenzoic Acid	*140*		*ug/L*	*127.500*		*110*	*31-116*			
2,4-D	51.00	100	"	57.5000	ND	88.7	50-131	15.8	30	
2,4,5-TP (Silvex)	31.00	25.0	"	28.7500	ND	108	50-129	0.810	30	
2,4,5-T	27.50	25.0	"	28.7500	ND	95.7	50-123	0.905	30	
Dinoseb	43.25	25.0	"	57.5000	ND	75.2	50-138	10.4	30	
Reference (1GC0901-SRM1)				Prepared: 03/16/23 Analyzed: 03/21/23						
Surrogate: 2,5-Dichlorobenzoic Acid	*2.96*		*ug/L*	*2.55000*		*116*	*31-116*			
2,4-D	1.19	2.0	"	1.15000		103	80-120			
2,4,5-TP (Silvex)	0.64	0.5	"	0.575000		112	80-120			
2,4,5-T	0.61	0.5	"	0.575000		106	80-120			
Dinoseb	0.80	0.5	"	1.15000		70.0	80-120			QR-06

ND = Non Detect; REC= Recovery; RPD= Relative Percent Difference

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

Keystone LABORATORIES
A Microbac Company

NELAP ACCREDITED TNI LABORATORY

MEMBER ACIL

Eurofins Test America, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613

March 22, 2023

Work Order: 1GC1313

Certified Analyses Included In This Report

Method/Matrix	Analyte	Certifications
EPA 8151A in Water		
	2,4-D	KS-NT,SIA1X
	2,4,5-TP (Silvex)	KS-NT,SIA1X
	2,4,5-T	KS-NT
	Dinoseb	KS-NT

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2023
KS-NT	Kansas Department of Health and Environment (NELAP)	E-10287	10/31/2023
MO-KC	Missouri Department of Natural Resources	140	04/30/2023
SIA1X	Iowa Dept. of Natural Resources	95	02/01/2024

Notes and Definitions

QR-06	The reference standard was outside of established control limits.
S-07	The surrogate recovery for this sample is outside of established control limits.

End of Report

Sue Thompson

Keystone Laboratories

Sue Thompson
Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

eurofins

16C 1313

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Thompson, Shirley J	Carrier Tracking No(s):	COC No: 310-59188.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Shirley.Thompson@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: Keystone Laboratories, Inc		Accreditations Required (See note): State Program - Iowa		Job #: 310-251194-1
Address: 600 East 17th Street South.	Due Date Requested: 3/24/2023			
City: Newton	TAT Requested (days):			
State, Zip: IA, 50208				
Phone:	PO #:			
Email:	WO #:			
Project Name: Cass County Sanitary Landfill(Spring 2023 WT HMSP)	Project #: 31002404			
Site:	SSOW#:			

Analysis Requested

1 G C 1 3 1 3
Eurofins Test America, Cedar Falls
PM: Sue Thompson

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
...O3
...O3
...odecahydrate
...ne
...5
...(specify)

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)	SUB (General Subcontract Method)/ 2,4,5-T ONLY	SUB (General Subcontract Method)/ 2,4-D/2,4,5-T/2,4,5-TP	Total Number of	Special Instructions/Note:
			Preservation Code:							
MW-20 (310-251194-3)	3/9/23	17:01 Central		Water			X		2	See Attached Instructions 01
MW-24 (310-251194-5)	3/9/23	16:02 Central		Water				X	2	See Attached Instructions 02

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our 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 Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

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:	Company	Received by:	Date/Time:	Company
[signature]	3/13/23 0945		Echo McMurry	3/13/23 12:00	
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: 0.0 Vice

Ver: 06/08/2021

ICOC No:
310-59188

Containers

Count	Container Type	Preservative
4	Amber Glass 1 liter - unpreserved	None

Subcontract Method Instructions

Sample IDs	Method	Method Description	Method Comments
3	SUBCONTRACT	SUB (General Subcontract Method)/ 2,4,5-T ONLY	2,4,5-T ONLY
5	SUBCONTRACT	SUB (General Subcontract Method)/ 2,4-D/2,4,5-T/2,4,5-TP	2,4-D/2,4,5-T/2,4,5-TP Only

1 G C 1 3 1 3

Eurofins Test America, Cedar Falls
PM: Sue Thompson

eurofins | Environment Testing America

310-251194 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Evora

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 3/10/23 | TIME 1615 | Received By: Am

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: W | Correction Factor (°C): 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(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

MW15 R. MW39
MW37
MW43

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: EVOTA

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 3/10/23 | TIME 1615 | Received By: AM

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? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: W | Correction Factor (°C): 0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 0.8 | Corrected Temp (°C): 0.8

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

UD-O MW19

MW-DW MW38R

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Evora

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 3/10/23 | TIME 1615 | Received By: AM

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: W | Correction Factor (°C): 0

• Temp Blank Temperature If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.1 | Corrected Temp (°C): 2.1

• 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

3/10/23 ~~HD-0~~ MW26

AM ~~MW-DW~~ MW24

TestAmerica

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER:
SITE NAME: Cass County Sanitary Landfill
ADDRESS: 1690 All State Ct, Ste 100
CITY/STATE/ZIP: West Des Moines, IA, 50265
TELEPHONE NUMBER: Fax:
SAMPLED BY (PRINT NAME): Konner Roth
SIGNATURE: Konner Roth

REPORT TO:
NAME: Ben Madson
COMPANY NAME: SCS Engineers
PROJECT NAME: Cass County Sanitary Landfill (Spring 2023 WT HMSP)
PROJECT NUMBER: 27223098 Task 1
ADDRESS: 1690 All State Ct, Ste 100
CITY/STATE/ZIP: West Des Moines, IA 50265

								Preservative								Matrix						Analyze For										
Sample ID	# of Containers Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	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)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Appendix I	Appendix II	Endosulfan I	Endosulfan Sulfate	Gamma-Chlordane	Sulfide	2,4,5-T [2C]	Total Suspended Solids	Trip Blank			Fax Results
MW 15R		3/9/23	12:31		X			X								X						X							X				
MW-12					X			X								X						X							X				
MW-19		3/9/23	1750		X			X								X						X				X	X		X				
MW-20		3/9/23	1701		X			X								X						X		X			X	X	X				
MW-21		3/9/23	1432		X			X								X						X					X		X				
MW-24		3/9/23	1602		X			X								X							X						X				
MW-37R		3/9/23	1515		X			X								X						X							X				
MW-38R	3/16/23	~~3/9/23~~	1049		X			X								X						X							X				
MW-39		3/9/23	1119		X			X								X						X							X				
MW-43		3/8/23	1516		X			X								X						X							X				
UD-0		3/10/23	920		X			X								X						X							X				
UD-1					X			X								X						X							X				
MW-DWT		3/9/23	1750		X			X								X						X							X				
Trip Blank															X						X									X			

Relinquished by	Date	Time	Received by	Date	Time	Relinquished by	Time
Konner Roth	3/10/23	14:00					

Shipped Via	Comments	Shipped Via

Received for lab by	Date	Time	Temperature Upon Receipt
Angie Meehery	3/10/23	16:15	

Laboratory Comment: (1) For Appendix and analysis report to the reporting limits, not the detection limits. Make sure that the reporting limits are below the EPA's MCL
(2) For analysis other than Appendix and report to the detection limits. Please make sure that the detection limits are below the EPA's MCLs
(3) In the "Result" column for all EDD files, when non-detect, please report the reporting limits or the detection limits instead of indicating with "ND"

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319-277 2401 Fax 319-277 2425

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Thompson Shirley J	Carrier Tracking No(s):	COC No: 310-59201 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Shirley Thompson@et.eurofinsus com	State of Origin: Iowa	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State Program - Iowa		Job #: 310-251194-1
Address: 2417 Bond Street	Due Date Requested: 3/23/2023			
City: University Park	TAT Requested (days):			
State Zip: IL 60484				
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	PO #:			
Email:	WO #:			
Project Name: Cass County Sanitary Landfill(Spring 2023 WT HMSP)	Project #: 31002404			
Site:	SSOW#:			

310-251194 COC

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, Y Trizma, 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)	9034_Calc/9030B	Total Number of containers	Special Instructions/Note
			Preservation Code						
MW-19 (310-251194-2)	3/9/23	17 50 Central		Water			X	1	
MW-20 (310-251194-3)	3/9/23	17 01 Central		Water			X	1	
MW-21 (310-251194-4)	3/9/23	14 32 Central		Water			X	1	
MW-24 (310-251194-5)	3/9/23	16 02 Central		Water			X	1	

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

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	Company	Received by	Date/Time	Company
[signature]	3/7/23 1420		[signature]	3/14/23 1010	[signature]
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: 29 → 28

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-251194-1
SDG Number: 27223098 Task1

Login Number: 251194
List Number: 1
Creator: Muehling, Angela C

List Source: Eurofins 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.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-251194-1
SDG Number: 27223098 Task1

Login Number: 251194
List Number: 2
Creator: Scott, Sherri L

List Source: Eurofins Chicago
List Creation: 03/14/23 11:05 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.8
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	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Jamie Lane
Evora Consulting
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

Generated 3/20/2023 2:44:07 PM

JOB DESCRIPTION

Cass County Sanitary Landfill (Spring 2023)
SDG NUMBER 27223098 Task 1

JOB NUMBER

310-251199-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
3/20/2023 2:44:07 PM

Authorized for release by
Tayler Sanderson, Project Manager I
Tayler.Sanderson@et.eurofinsus.com
Designee for
Shirley Thompson, Client Service Manager
Shirley.Thompson@et.eurofinsus.com
(319)277-2401

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Case Narrative

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Job ID: 310-251199-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-251199-1

Receipt
The sample was received on 3/10/2023 4:15 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.1°C

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

Metals
Method 6010D: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-20 (310-251199-1). The sample(s) was preserved to the appropriate pH in the laboratory.

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

Job ID: 310-251199-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-251199-2

Comments
No additional comments.

Receipt
The sample was received on 3/10/2023 4:15 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1º C.

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

Sample Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-251199-1	MW-20	Ground Water	03/09/23 17:01	03/10/23 16:15

Detection Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Client Sample ID: MW-20 — Lab Sample ID: 310-251199-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nitrate as N	1.97		0.100	0.0420	mg/L	1		9056A	Total/NA
Sulfate	0.491	J	1.00	0.400	mg/L	1		9056A	Total/NA
Iron	67.6		0.500	0.0930	mg/L	1		6010D	Total/NA
Manganese	16.1		0.0100	0.00320	mg/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Client Sample ID: MW-20

Date Collected: 03/09/23 17:01
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251199-1

Matrix: Ground Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	1.97		0.100	0.0420	mg/L			03/10/23 18:56	1
Sulfate	0.491	J	1.00	0.400	mg/L			03/10/23 18:56	1

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	67.6		0.500	0.0930	mg/L		03/15/23 09:45	03/17/23 15:25	1
Manganese	16.1		0.0100	0.00320	mg/L		03/15/23 09:45	03/17/23 15:25	1

Definitions/Glossary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

QC Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-381270/3
Matrix: Water
Analysis Batch: 381270

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	<0.100		0.100	0.0420	mg/L			03/10/23 10:44	1
Sulfate	<1.00		1.00	0.400	mg/L			03/10/23 10:44	1

Lab Sample ID: LCS 310-381270/4
Matrix: Water
Analysis Batch: 381270

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	2.00	2.080		mg/L		104	90 - 110
Sulfate	10.0	10.13		mg/L		101	90 - 110

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 310-381290/1-A
Matrix: Water
Analysis Batch: 381669

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 381290

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<0.500		0.500	0.0930	mg/L		03/15/23 09:45	03/17/23 15:21	1
Manganese	<0.0100		0.0100	0.00320	mg/L		03/15/23 09:45	03/17/23 15:21	1

Lab Sample ID: LCS 310-381290/2-A
Matrix: Water
Analysis Batch: 381669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 381290

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	2.00	1.923		mg/L		96	80 - 120
Manganese	1.00	0.9660		mg/L		97	80 - 120

QC Association Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

HPLC/IC

Analysis Batch: 381270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251199-1	MW-20	Total/NA	Ground Water	9056A	
MB 310-381270/3	Method Blank	Total/NA	Water	9056A	
LCS 310-381270/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 381290

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251199-1	MW-20	Total/NA	Ground Water	3005A	
MB 310-381290/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-381290/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 381669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251199-1	MW-20	Total/NA	Ground Water	6010D	381290
MB 310-381290/1-A	Method Blank	Total/NA	Water	6010D	381290
LCS 310-381290/2-A	Lab Control Sample	Total/NA	Water	6010D	381290

Lab Chronicle

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Client Sample ID: MW-20

Date Collected: 03/09/23 17:01
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251199-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	381270	QTZ5	EET CF	03/10/23 18:56
Total/NA	Prep	3005A			381290	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6010D		1	381669	ZRI4	EET CF	03/17/23 15:25

Laboratory References:

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

Accreditation/Certification Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

Method Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring 2023)

Job ID: 310-251199-1
SDG: 27223098 Task 1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

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310-251199 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: Evora			
City/State:	CITY	STATE	Project:

Receipt Information			
Date/Time Received:	DATE 3/10/23	TIME 1615	Received By: AM

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 # _____ 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: W	Correction Factor (°C): 0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.1	Corrected Temp (°C): 2.1

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

MW-20

TestAmerica
3019 Venture Way
Cedar Falls, Iowa 50613
319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER.
SITE NAME. Cass County Sanitary Landfill
ADDRESS. 1690 All State Ct Ste 100
CITY/STATE/ZIP. West Des Moines 50265
TELEPHONE NUMBER
Fax.
SAMPLED BY (PRINT NAME) Konner Roth
SIGNATURE Konner Roth

REPORT TO
NAME. Benjamin Madson
COMPANY NAME SCS Engineers
PROJECT NAME. Cass County Sanitary Landfill (Spring 2023 Bracketing)
PROJECT NUMBER 27223098 Task 1
ADDRESS. 1690 All State Ct, Ste 100
CITY/STATE/ZIP. West Des Moines, IA 50265

								Preservative								Matrix						Analyze For:											
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab		Field Filtered	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)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Total Arsenic	Total Barium	Total Suspended Solids	Nitrate	Manganese	Iron	Sulfate						Fax Results
MW 12	2				X			X								X									X	X	X	X						
MW 20	2	3/9/23	1701		X			X								X									X	X	X	X						

Relinquished by: Konner Roth	Date: 3/10/23	Time: 14:00	Received by:	Date:	Time:	Relinquished by:	Date:		Time:
Shipped Via			Comments.			Sh pped Via.			
Received for lab by: Angie Muehling	Date: 3/10/23	Time: 1605	Temperature Upon Receipt:			Laboratory Comments. (1) For Appendix and II analysi report to the reporting limits, not the detection imits. Make sure that the reporting imits are below the EPA's MCLs. (2) For analysis other than Appendix and II report to the detection imits. Please make sure that the detection imits are below the EPA's MCLs. (3) In the "Result" column for all EDD files, when non-detect, please report "<" the reporting limits or the detection limits instead of indicating with "ND"			

3/20/2023

Login Sample Receipt Checklist

Client: Evora Consulting

Job Number: 310-251199-1
SDG Number: 27223098 Task 1

Login Number: 251199
List Number: 1
Creator: Muehling, Angela C

List Source: Eurofins 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.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Ben Madson
Evora Consulting
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

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JOB DESCRIPTION

Cass County Sanitary Landfill (Spring Geochem WT)
SDG NUMBER 27223098 Task1

JOB NUMBER

310-251200-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

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Job ID: 310-251200-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-251200-1

Receipt
The sample was received on 3/10/2023 4:15 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.8°C

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

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

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

Sample Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-251200-1	UD-0	Ground Water	03/10/23 09:20	03/10/23 16:15

Detection Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Client Sample ID: UD-0 — Lab Sample ID: 310-251200-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	677		10.0	4.50	mg/L	10		9056A	Total/NA
Sulfate	52.6		5.00	2.00	mg/L	5		9056A	Total/NA
Calcium	189		1.00	0.330	mg/L	1		6010D	Total/NA
Magnesium	103		1.00	0.250	mg/L	1		6010D	Total/NA
Potassium	41.1		2.00	0.880	mg/L	1		6010D	Total/NA
Sodium	327		2.00	1.20	mg/L	1		6010D	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	800		5.00	2.30	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	800		5.00	2.30	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Client Sample ID: UD-0

Lab Sample ID: 310-251200-1

Date Collected: 03/10/23 09:20
Matrix: Ground Water
Date Received: 03/10/23 16:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	677		10.0	4.50	mg/L			03/16/23 10:46	10
Sulfate	52.6		5.00	2.00	mg/L			03/15/23 20:36	5

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	189		1.00	0.330	mg/L		03/15/23 09:45	03/17/23 15:27	1
Magnesium	103		1.00	0.250	mg/L		03/15/23 09:45	03/17/23 15:27	1
Potassium	41.1		2.00	0.880	mg/L		03/15/23 09:45	03/17/23 15:27	1
Sodium	327		2.00	1.20	mg/L		03/15/23 09:45	03/20/23 12:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5 (SM 2320B)	800		5.00	2.30	mg/L			03/14/23 12:32	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	800		5.00	2.30	mg/L			03/14/23 12:32	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<5.00		5.00	2.30	mg/L			03/14/23 12:32	1

Definitions/Glossary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Qualifiers

Metals

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

Glossary

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

QC Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-381506/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381506

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.450	mg/L			03/15/23 15:26	1
Sulfate	<1.00		1.00	0.400	mg/L			03/15/23 15:26	1

Lab Sample ID: LCS 310-381506/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381506

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.770		mg/L		98	90 - 110
Sulfate	10.0	10.18		mg/L		102	90 - 110

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 310-381290/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381669 — **Prep Batch: 381290**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<1.00		1.00	0.330	mg/L		03/15/23 09:45	03/17/23 15:21	1
Magnesium	<1.00		1.00	0.250	mg/L		03/15/23 09:45	03/17/23 15:21	1
Potassium	<2.00		2.00	0.880	mg/L		03/15/23 09:45	03/17/23 15:21	1

Lab Sample ID: MB 310-381290/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381712 — **Prep Batch: 381290**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	<2.00		2.00	1.20	mg/L		03/15/23 09:45	03/20/23 12:49	1

Lab Sample ID: LCS 310-381290/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381669 — **Prep Batch: 381290**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Calcium	20.0	19.00		mg/L		95	80 - 120
Magnesium	20.0	20.08		mg/L		100	80 - 120
Potassium	20.0	20.13		mg/L		101	80 - 120

Lab Sample ID: LCS 310-381290/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381712 — **Prep Batch: 381290**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sodium	20.0	18.50		mg/L		93	80 - 120

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 310-251200-1 MS — **Client Sample ID: UD-0**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381669 — **Prep Batch: 381290**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Calcium	189		20.0	205.3	4	mg/L		82	75 - 125		
Magnesium	103		20.0	121.5	4	mg/L		95	75 - 125		
Potassium	41.1		20.0	60.98		mg/L		100	75 - 125		

Lab Sample ID: 310-251200-1 MS — **Client Sample ID: UD-0**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381712 — **Prep Batch: 381290**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Sodium	327		20.0	348.3	4	mg/L		105	75 - 125		

Lab Sample ID: 310-251200-1 MSD — **Client Sample ID: UD-0**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381669 — **Prep Batch: 381290**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Calcium	189		20.0	206.1	4	mg/L		86	75 - 125	0	20
Magnesium	103		20.0	122.1	4	mg/L		98	75 - 125	0	20
Potassium	41.1		20.0	61.26		mg/L		101	75 - 125	0	20

Lab Sample ID: 310-251200-1 MSD — **Client Sample ID: UD-0**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381712 — **Prep Batch: 381290**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sodium	327		20.0	348.4	4	mg/L		105	75 - 125	0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-381289/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381289

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3 to pH 4.5	<5.00		5.00	2.30	mg/L			03/14/23 10:00	1
Bicarbonate Alkalinity as CaCO3	<5.00		5.00	2.30	mg/L			03/14/23 10:00	1
Carbonate Alkalinity as CaCO3	<5.00		5.00	2.30	mg/L			03/14/23 10:00	1

Lab Sample ID: LCS 310-381289/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381289

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Alkalinity as CaCO3 to pH 4.5			1000	1029		mg/L		103	90 - 110		

QC Association Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

HPLC/IC

Analysis Batch: 381506

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251200-1	UD-0	Total/NA	Ground Water	9056A	
310-251200-1	UD-0	Total/NA	Ground Water	9056A	
MB 310-381506/3	Method Blank	Total/NA	Water	9056A	
LCS 310-381506/6	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 381290

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251200-1	UD-0	Total/NA	Ground Water	3005A	
MB 310-381290/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-381290/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-251200-1 MS	UD-0	Total/NA	Ground Water	3005A	
310-251200-1 MSD	UD-0	Total/NA	Ground Water	3005A	

Analysis Batch: 381669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251200-1	UD-0	Total/NA	Ground Water	6010D	381290
MB 310-381290/1-A	Method Blank	Total/NA	Water	6010D	381290
LCS 310-381290/2-A	Lab Control Sample	Total/NA	Water	6010D	381290
310-251200-1 MS	UD-0	Total/NA	Ground Water	6010D	381290
310-251200-1 MSD	UD-0	Total/NA	Ground Water	6010D	381290

Analysis Batch: 381712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251200-1	UD-0	Total/NA	Ground Water	6010D	381290
MB 310-381290/1-A	Method Blank	Total/NA	Water	6010D	381290
LCS 310-381290/2-A	Lab Control Sample	Total/NA	Water	6010D	381290
310-251200-1 MS	UD-0	Total/NA	Ground Water	6010D	381290
310-251200-1 MSD	UD-0	Total/NA	Ground Water	6010D	381290

General Chemistry

Analysis Batch: 381289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251200-1	UD-0	Total/NA	Ground Water	SM 2320B	
MB 310-381289/2	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-381289/3	Lab Control Sample	Total/NA	Water	SM 2320B	

Lab Chronicle

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Client Sample ID: UD-0

Date Collected: 03/10/23 09:20
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251200-1

Matrix: Ground Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	381506	QTZ5	EET CF	03/15/23 20:36
Total/NA	Analysis	9056A		10	381506	QTZ5	EET CF	03/16/23 10:46
Total/NA	Prep	3005A			381290	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6010D		1	381669	ZRI4	EET CF	03/17/23 15:27
Total/NA	Prep	3005A			381290	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6010D		1	381712	ZRI4	EET CF	03/20/23 12:53
Total/NA	Analysis	SM 2320B		1	381289	MAQ3	EET CF	03/14/23 12:32

Laboratory References:

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

Accreditation/Certification Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

Method Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill (Spring Geochem WT)

Job ID: 310-251200-1
SDG: 27223098 Task1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
SM 2320B	Alkalinity	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

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:

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

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310-251200 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Evora

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 3/10/23 TIME 1615 | Received By: AM

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 # _____ 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? ↓

3/10/23 AM UD-0

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: W | Correction Factor (°C): 0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 0.8 | Corrected Temp (°C): 0.8

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

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER: Konner Roth
SITE NAME: Cass County Sanitary Landfill
ADDRESS: 1690 All State Ct Ste 100
CITY/STATE/ZIP: West Des Moines, IA, 50265
TELEPHONE NUMBER: Fax
SAMPLED BY: (PRINT NAME) Konner Roth
SIGNATURE: Konner Roth

REPORT TO
NAME: Ben Madson
COMPANY NAME: SCS Engineers
PROJECT NAME: Cass County Sanitary Landfill (Spring 2023 Geochem WT)
PROJECT NUMBER: 27223098 Task 1
ADDRESS: 1690 All State Ct, Ste 100
CITY/STATE/ZIP: West Des Moines, IA 50265

								Preservative								Matrix						Analyze For:															
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Contaners Shipped	Grab	Composite	Field Filtered	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)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Alkalinity Biocarbonate	Alkalinity Carbonate	Calcium	Chloride	Magnesium	Potassium	Sodium	Sulfate	Trip Blank								Fax Results
UD-0	2	3/10/23	9:20		X			X								X						X	X	X	X	X	X	X	X									
Trip Blank	1																				X									X								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Relinquished by:	Date:	Time:

Shipped Via | Comments: | Shipped Via.

Received for lab by: Eugene Muehlenz | Date: 3/10/23 | Time: 16:15 | Temperature Upon Receipt:

Laboratory Comment (1) For Appendix and analysis, report to the reporting limits, not the detection limits Make sure that the reporting limits are below the EPA MCLs.
(2) For analysis other than Appendix and report to the detection limits. Please make sure that the detection limits are below the EPA MCLs.
(3) In the "Result" column for all EDD files, when non-detect, please report "<" the reporting limits or the detection limits instead of indicating with "ND"

Login Sample Receipt Checklist

Client: Evora Consulting

Job Number: 310-251200-1
SDG Number: 27223098 Task1

Login Number: 251200
List Number: 1
Creator: Muehling, Angela C

List Source: Eurofins 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.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Jamie Lane
Evora Consulting
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

Generated 3/16/2023 3:32:10 PM

JOB DESCRIPTION

Cass County Sanitary Landfill(Spring 2023 HMSP DS)
SDG NUMBER 27223098 Task 1

JOB NUMBER

310-251201-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Job ID: 310-251201-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-251201-1

Comments
No additional comments.

Receipt
The samples were received on 3/10/2023 4:15 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were -0.3º C and 0.8º C.

GC/MS VOA
Method 8260D: The continuing calibration verification (CCV) associated with batch 310-381097 recovered above the upper control limit for Trichlorofluoromethane (28.6%D). The LCS associated with this CCV passed CCV criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-381097/4).

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

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

General Chemistry
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: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-251201-1	MW-22	Ground Water	03/09/23 11:53	03/10/23 16:15
310-251201-2	MW-11	Ground Water	03/08/23 14:43	03/10/23 16:15
310-251201-3	MW-23	Ground Water	03/09/23 13:57	03/10/23 16:15
310-251201-4	MW-36	Ground Water	03/10/23 10:25	03/10/23 16:15
310-251201-5	MW-DDS	Ground Water	03/10/23 10:25	03/10/23 16:15
310-251201-6	Trip Blank 1	Water	03/08/23 00:00	03/10/23 16:15
310-251201-7	Trip Blank 2	Water	03/08/23 00:00	03/10/23 16:15

Detection Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-22 — Lab Sample ID: 310-251201-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00103	J F1	0.00200	0.000690	mg/L	1		6020B	Total/NA
Arsenic	0.000840	J	0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	0.251		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.000186		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Cobalt	0.000197	J	0.000500	0.000190	mg/L	1		6020B	Total/NA
Lead	0.000369	J	0.000500	0.000240	mg/L	1		6020B	Total/NA
Selenium	0.00205	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Thallium	0.000746	J	0.00100	0.000260	mg/L	1		6020B	Total/NA
Vanadium	0.00133	J	0.00500	0.00110	mg/L	1		6020B	Total/NA

Client Sample ID: MW-11 — Lab Sample ID: 310-251201-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	0.445	J	1.00	0.400	ug/L	1		8260D	Total/NA
Antimony	0.000829	J	0.00200	0.000690	mg/L	1		6020B	Total/NA
Arsenic	0.0135		0.00200	0.000750	mg/L	1		6020B	Total/NA
Barium	0.745		0.00200	0.000880	mg/L	1		6020B	Total/NA
Beryllium	0.000338	J	0.00100	0.000270	mg/L	1		6020B	Total/NA
Cadmium	0.000259		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Cobalt	0.0134		0.000500	0.000190	mg/L	1		6020B	Total/NA
Lead	0.000534		0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.0188		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00135	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Thallium	0.00122		0.00100	0.000260	mg/L	1		6020B	Total/NA
Total Suspended Solids	11.3		3.75	1.28	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-23 — Lab Sample ID: 310-251201-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.157		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.0000730	J	0.000100	0.0000550	mg/L	1		6020B	Total/NA
Selenium	0.00209	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Total Suspended Solids	1.75	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-36 — Lab Sample ID: 310-251201-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.128		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.000194		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Chromium	0.00476	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.00161		0.000500	0.000190	mg/L	1		6020B	Total/NA
Nickel	0.00796		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00230	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Total Suspended Solids	4.13		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-DDS — Lab Sample ID: 310-251201-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.125		0.00200	0.000880	mg/L	1		6020B	Total/NA
Cadmium	0.00120		0.000100	0.0000550	mg/L	1		6020B	Total/NA
Chromium	0.00474	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.00156		0.000500	0.000190	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-DDS (Continued) — Lab Sample ID: 310-251201-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	0.000272	J	0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.00818		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00174	J	0.00500	0.000960	mg/L	1		6020B	Total/NA
Total Suspended Solids	6.63		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: Trip Blank 1 — Lab Sample ID: 310-251201-6

No Detections.

Client Sample ID: Trip Blank 2 — Lab Sample ID: 310-251201-7

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-22

Date Collected: 03/09/23 11:53
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-1

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 16:47	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 16:47	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 16:47	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 16:47	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 16:47	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 16:47	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 16:47	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 16:47	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 16:47	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 16:47	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 16:47	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 16:47	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 16:47	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 16:47	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 16:47	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 16:47	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 16:47	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 16:47	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 16:47	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 16:47	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 16:47	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 16:47	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 16:47	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 16:47	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 16:47	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 16:47	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 16:47	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 16:47	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 16:47	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 16:47	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 16:47	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 16:47	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 16:47	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 16:47	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 16:47	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 16:47	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 16:47	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 16:47	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 16:47	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 16:47	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 16:47	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 16:47	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 16:47	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 16:47	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 16:47	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 16:47	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 16:47	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-22

Date Collected: 03/09/23 11:53
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-1

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*03/13/23 16:47*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 128*		*03/13/23 16:47*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 16:47*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00103**	**J F1**	0.00200	0.000690	mg/L		03/15/23 09:45	03/15/23 20:32	1
Arsenic	**0.000840**	**J**	0.00200	0.000750	mg/L		03/15/23 09:45	03/15/23 20:32	1
Barium	**0.251**		0.00200	0.000880	mg/L		03/15/23 09:45	03/15/23 20:32	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/15/23 09:45	03/15/23 20:32	1
Cadmium	**0.000186**		0.000100	0.0000550	mg/L		03/15/23 09:45	03/15/23 20:32	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:32	1
Cobalt	**0.000197**	**J**	0.000500	0.000190	mg/L		03/15/23 09:45	03/15/23 20:32	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/15/23 09:45	03/15/23 20:32	1
Lead	**0.000369**	**J**	0.000500	0.000240	mg/L		03/15/23 09:45	03/15/23 20:32	1
Nickel	<0.00500		0.00500	0.00190	mg/L		03/15/23 09:45	03/15/23 20:32	1
Selenium	**0.00205**	**J**	0.00500	0.000960	mg/L		03/15/23 09:45	03/15/23 20:32	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/15/23 09:45	03/15/23 20:32	1
Thallium	**0.000746**	**J**	0.00100	0.000260	mg/L		03/15/23 09:45	03/15/23 20:32	1
Vanadium	**0.00133**	**J**	0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:32	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/15/23 09:45	03/15/23 20:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88	0.638	mg/L			03/14/23 07:04	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-11

Date Collected: 03/08/23 14:43
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-2

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 17:08	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 17:08	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 17:08	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 17:08	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 17:08	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 17:08	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 17:08	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 17:08	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 17:08	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 17:08	1
Chlorobenzene	**0.445**	**J**	1.00	0.400	ug/L			03/13/23 17:08	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 17:08	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 17:08	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 17:08	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 17:08	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 17:08	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 17:08	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 17:08	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 17:08	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 17:08	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 17:08	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 17:08	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 17:08	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 17:08	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 17:08	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 17:08	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 17:08	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 17:08	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 17:08	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 17:08	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 17:08	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 17:08	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 17:08	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 17:08	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 17:08	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 17:08	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 17:08	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 17:08	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 17:08	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 17:08	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 17:08	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 17:08	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 17:08	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 17:08	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 17:08	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 17:08	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 17:08	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-11

Date Collected: 03/08/23 14:43
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-2

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/13/23 17:08*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 128*		*03/13/23 17:08*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 17:08*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.000829**	**J**	0.00200	0.000690	mg/L		03/15/23 09:45	03/15/23 20:46	1
Arsenic	**0.0135**		0.00200	0.000750	mg/L		03/15/23 09:45	03/15/23 20:46	1
Barium	**0.745**		0.00200	0.000880	mg/L		03/15/23 09:45	03/15/23 20:46	1
Beryllium	**0.000338**	**J**	0.00100	0.000270	mg/L		03/15/23 09:45	03/15/23 20:46	1
Cadmium	**0.000259**		0.000100	0.0000550	mg/L		03/15/23 09:45	03/15/23 20:46	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:46	1
Cobalt	**0.0134**		0.000500	0.000190	mg/L		03/15/23 09:45	03/15/23 20:46	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/15/23 09:45	03/15/23 20:46	1
Lead	**0.000534**		0.000500	0.000240	mg/L		03/15/23 09:45	03/15/23 20:46	1
Nickel	**0.0188**		0.00500	0.00190	mg/L		03/15/23 09:45	03/15/23 20:46	1
Selenium	**0.00135**	**J**	0.00500	0.000960	mg/L		03/15/23 09:45	03/15/23 20:46	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/15/23 09:45	03/15/23 20:46	1
Thallium	**0.00122**		0.00100	0.000260	mg/L		03/15/23 09:45	03/15/23 20:46	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:46	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/15/23 09:45	03/15/23 20:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**11.3**		3.75	1.28	mg/L			03/14/23 07:04	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-23

Date Collected: 03/09/23 13:57
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-3

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 17:29	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 17:29	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 17:29	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 17:29	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 17:29	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 17:29	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 17:29	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 17:29	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 17:29	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 17:29	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 17:29	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 17:29	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 17:29	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 17:29	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 17:29	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 17:29	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 17:29	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 17:29	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 17:29	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 17:29	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 17:29	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 17:29	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 17:29	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 17:29	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 17:29	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 17:29	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 17:29	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 17:29	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 17:29	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 17:29	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 17:29	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 17:29	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 17:29	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 17:29	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 17:29	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 17:29	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 17:29	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 17:29	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 17:29	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 17:29	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 17:29	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 17:29	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 17:29	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 17:29	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 17:29	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 17:29	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 17:29	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-23

Date Collected: 03/09/23 13:57
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-3

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*03/13/23 17:29*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 128*		*03/13/23 17:29*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*03/13/23 17:29*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/15/23 09:45	03/15/23 20:49	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/15/23 09:45	03/15/23 20:49	1
Barium	**0.157**		0.00200	0.000880	mg/L		03/15/23 09:45	03/15/23 20:49	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/15/23 09:45	03/15/23 20:49	1
Cadmium	**0.0000730**	**J**	0.000100	0.0000550	mg/L		03/15/23 09:45	03/15/23 20:49	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:49	1
Cobalt	<0.000500		0.000500	0.000190	mg/L		03/15/23 09:45	03/15/23 20:49	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/15/23 09:45	03/15/23 20:49	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/15/23 09:45	03/15/23 20:49	1
Nickel	<0.00500		0.00500	0.00190	mg/L		03/15/23 09:45	03/15/23 20:49	1
Selenium	**0.00209**	**J**	0.00500	0.000960	mg/L		03/15/23 09:45	03/15/23 20:49	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/15/23 09:45	03/15/23 20:49	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/15/23 09:45	03/15/23 20:49	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:49	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/15/23 09:45	03/15/23 20:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**1.75**	**J**	1.88	0.638	mg/L			03/14/23 10:29	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-36

Date Collected: 03/10/23 10:25
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-4

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 17:51	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 17:51	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 17:51	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 17:51	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 17:51	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 17:51	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 17:51	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 17:51	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 17:51	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 17:51	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 17:51	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 17:51	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 17:51	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 17:51	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 17:51	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 17:51	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 17:51	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 17:51	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 17:51	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 17:51	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 17:51	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 17:51	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 17:51	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 17:51	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 17:51	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 17:51	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 17:51	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 17:51	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 17:51	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 17:51	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 17:51	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 17:51	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 17:51	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 17:51	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 17:51	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 17:51	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 17:51	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 17:51	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 17:51	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 17:51	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 17:51	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 17:51	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 17:51	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 17:51	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 17:51	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 17:51	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 17:51	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-36

Date Collected: 03/10/23 10:25
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-4

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/13/23 17:51*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 128*		*03/13/23 17:51*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/13/23 17:51*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/15/23 09:45	03/15/23 21:12	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/15/23 09:45	03/15/23 21:12	1
Barium	**0.128**		0.00200	0.000880	mg/L		03/15/23 09:45	03/15/23 21:12	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/15/23 09:45	03/15/23 21:12	1
Cadmium	**0.000194**		0.000100	0.0000550	mg/L		03/15/23 09:45	03/15/23 21:12	1
Chromium	**0.00476**	**J**	0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 21:12	1
Cobalt	**0.00161**		0.000500	0.000190	mg/L		03/15/23 09:45	03/15/23 21:12	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/15/23 09:45	03/15/23 21:12	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/15/23 09:45	03/15/23 21:12	1
Nickel	**0.00796**		0.00500	0.00190	mg/L		03/15/23 09:45	03/15/23 21:12	1
Selenium	**0.00230**	**J**	0.00500	0.000960	mg/L		03/15/23 09:45	03/15/23 21:12	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/15/23 09:45	03/15/23 21:12	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/15/23 09:45	03/15/23 21:12	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 21:12	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/15/23 09:45	03/15/23 21:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**4.13**		1.88	0.638	mg/L			03/13/23 14:52	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-DDS

Date Collected: 03/10/23 10:25
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-5

Matrix: Ground Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 18:12	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 18:12	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 18:12	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 18:12	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 18:12	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 18:12	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 18:12	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 18:12	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 18:12	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 18:12	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 18:12	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 18:12	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 18:12	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 18:12	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 18:12	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 18:12	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 18:12	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 18:12	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 18:12	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 18:12	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 18:12	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 18:12	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 18:12	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 18:12	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 18:12	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 18:12	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 18:12	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 18:12	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 18:12	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 18:12	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 18:12	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 18:12	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 18:12	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 18:12	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 18:12	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 18:12	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 18:12	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 18:12	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 18:12	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 18:12	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 18:12	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 18:12	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 18:12	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 18:12	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 18:12	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 18:12	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 18:12	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-DDS

Date Collected: 03/10/23 10:25
Date Received: 03/10/23 16:15

Lab Sample ID: 310-251201-5

Matrix: Ground Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*03/13/23 18:12*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 128*		*03/13/23 18:12*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/13/23 18:12*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/15/23 09:45	03/15/23 21:15	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/15/23 09:45	03/15/23 21:15	1
Barium	**0.125**		0.00200	0.000880	mg/L		03/15/23 09:45	03/15/23 21:15	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/15/23 09:45	03/15/23 21:15	1
Cadmium	**0.00120**		0.000100	0.0000550	mg/L		03/15/23 09:45	03/15/23 21:15	1
Chromium	**0.00474**	**J**	0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 21:15	1
Cobalt	**0.00156**		0.000500	0.000190	mg/L		03/15/23 09:45	03/15/23 21:15	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/15/23 09:45	03/15/23 21:15	1
Lead	**0.000272**	**J**	0.000500	0.000240	mg/L		03/15/23 09:45	03/15/23 21:15	1
Nickel	**0.00818**		0.00500	0.00190	mg/L		03/15/23 09:45	03/15/23 21:15	1
Selenium	**0.00174**	**J**	0.00500	0.000960	mg/L		03/15/23 09:45	03/15/23 21:15	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/15/23 09:45	03/15/23 21:15	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/15/23 09:45	03/15/23 21:15	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 21:15	1
Zinc	<0.0200		0.0200	0.0100	mg/L		03/15/23 09:45	03/15/23 21:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**6.63**		1.88	0.638	mg/L			03/13/23 14:52	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: Trip Blank 1

Lab Sample ID: 310-251201-6

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 13:13	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 13:13	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 13:13	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 13:13	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 13:13	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 13:13	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 13:13	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 13:13	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 13:13	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 13:13	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 13:13	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 13:13	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 13:13	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 13:13	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 13:13	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 13:13	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 13:13	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 13:13	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 13:13	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 13:13	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 13:13	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 13:13	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 13:13	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 13:13	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 13:13	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 13:13	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 13:13	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 13:13	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 13:13	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 13:13	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 13:13	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 13:13	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 13:13	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 13:13	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 13:13	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 13:13	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 13:13	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 13:13	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 13:13	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 13:13	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 13:13	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 13:13	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 13:13	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 13:13	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 13:13	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 13:13	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 13:13	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: Trip Blank 1

Lab Sample ID: 310-251201-6

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		80 - 120		03/13/23 13:13	1
Dibromofluoromethane (Surr)	100		80 - 128		03/13/23 13:13	1
Toluene-d8 (Surr)	98		80 - 120		03/13/23 13:13	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: Trip Blank 2

Lab Sample ID: 310-251201-7

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			03/13/23 13:34	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 13:34	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 13:34	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 13:34	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 13:34	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 13:34	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 13:34	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 13:34	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 13:34	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 13:34	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 13:34	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 13:34	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 13:34	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 13:34	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 13:34	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 13:34	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 13:34	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 13:34	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 13:34	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 13:34	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 13:34	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 13:34	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 13:34	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 13:34	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 13:34	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 13:34	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 13:34	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 13:34	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 13:34	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 13:34	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 13:34	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 13:34	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 13:34	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 13:34	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 13:34	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 13:34	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 13:34	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 13:34	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 13:34	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 13:34	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 13:34	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 13:34	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 13:34	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 13:34	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 13:34	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 13:34	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 13:34	1

Client Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: Trip Blank 2

Lab Sample ID: 310-251201-7

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		80 - 120		03/13/23 13:34	1
Dibromofluoromethane (Surr)	100		80 - 128		03/13/23 13:34	1
Toluene-d8 (Surr)	98		80 - 120		03/13/23 13:34	1

Definitions/Glossary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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
E	Result exceeded calibration range.
F1	MS and/or MSD recovery 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.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Surrogate Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Method: 8260D - 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)	(80-128)	(80-120)
310-251201-1	MW-22	100	100	98
310-251201-2	MW-11	98	103	98
310-251201-3	MW-23	96	101	98
310-251201-4	MW-36	99	101	97
310-251201-5	MW-DDS	99	100	97

Surrogate Legend

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

Method: 8260D - 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)	(80-128)	(80-120)
310-251201-6	Trip Blank 1	99	100	98
310-251201-7	Trip Blank 2	99	100	98
LCS 310-381097/6	Lab Control Sample	98	98	100
LCS 310-381097/7	Lab Control Sample	98	101	98
MB 310-381097/5	Method Blank	98	102	98

Surrogate Legend

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

QC Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 310-381097/5
Matrix: Water
Analysis Batch: 381097

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	3.10	ug/L			03/13/23 11:26	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			03/13/23 11:26	1
Benzene	<0.500		0.500	0.220	ug/L			03/13/23 11:26	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			03/13/23 11:26	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			03/13/23 11:26	1
Bromoform	<5.00		5.00	0.780	ug/L			03/13/23 11:26	1
Bromomethane	<4.00		4.00	1.10	ug/L			03/13/23 11:26	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			03/13/23 11:26	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			03/13/23 11:26	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			03/13/23 11:26	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			03/13/23 11:26	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			03/13/23 11:26	1
Chloroethane	<4.00		4.00	0.790	ug/L			03/13/23 11:26	1
Chloroform	<3.00		3.00	1.30	ug/L			03/13/23 11:26	1
Chloromethane	<3.00		3.00	0.610	ug/L			03/13/23 11:26	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			03/13/23 11:26	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			03/13/23 11:26	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			03/13/23 11:26	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			03/13/23 11:26	1
Dibromomethane	<1.00		1.00	0.330	ug/L			03/13/23 11:26	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			03/13/23 11:26	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			03/13/23 11:26	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			03/13/23 11:26	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			03/13/23 11:26	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			03/13/23 11:26	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			03/13/23 11:26	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			03/13/23 11:26	1
2-Hexanone	<10.0		10.0	2.00	ug/L			03/13/23 11:26	1
Iodomethane	<10.0		10.0	7.00	ug/L			03/13/23 11:26	1
Methylene chloride	<5.00		5.00	1.70	ug/L			03/13/23 11:26	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			03/13/23 11:26	1
Styrene	<1.00		1.00	0.370	ug/L			03/13/23 11:26	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			03/13/23 11:26	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			03/13/23 11:26	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			03/13/23 11:26	1
Toluene	<1.00		1.00	0.430	ug/L			03/13/23 11:26	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			03/13/23 11:26	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			03/13/23 11:26	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			03/13/23 11:26	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			03/13/23 11:26	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			03/13/23 11:26	1
Trichloroethene	<1.00		1.00	0.430	ug/L			03/13/23 11:26	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			03/13/23 11:26	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			03/13/23 11:26	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			03/13/23 11:26	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			03/13/23 11:26	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			03/13/23 11:26	1

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

Lab Sample ID: MB 310-381097/5
Matrix: Water
Analysis Batch: 381097

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

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		80 - 120		03/13/23 11:26	1
Dibromofluoromethane (Surr)	102		80 - 128		03/13/23 11:26	1
Toluene-d8 (Surr)	98		80 - 120		03/13/23 11:26	1

Lab Sample ID: LCS 310-381097/6
Matrix: Water
Analysis Batch: 381097

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	40.39		ug/L		101	50 - 150
Acrylonitrile	200	181.6		ug/L		91	50 - 150
Benzene	20.0	17.50		ug/L		88	73 - 122
Bromochloromethane	20.0	19.13		ug/L		96	68 - 132
Bromodichloromethane	20.0	18.19		ug/L		91	72 - 121
Bromoform	20.0	14.34		ug/L		72	55 - 129
2-Butanone (MEK)	40.0	34.38		ug/L		86	50 - 150
Carbon disulfide	20.0	16.37		ug/L		82	58 - 131
Carbon tetrachloride	20.0	16.57		ug/L		83	67 - 132
Chlorobenzene	20.0	17.26		ug/L		86	69 - 121
Chlorodibromomethane	20.0	16.12		ug/L		81	69 - 122
Chloroform	20.0	18.82		ug/L		94	72 - 120
cis-1,2-Dichloroethene	20.0	18.73		ug/L		94	74 - 120
cis-1,3-Dichloropropene	20.0	16.64		ug/L		83	71 - 126
1,2-Dibromo-3-chloropropane	20.0	15.85		ug/L		79	50 - 150
1,2-Dibromoethane (EDB)	20.0	18.09		ug/L		90	73 - 125
Dibromomethane	20.0	19.16		ug/L		96	72 - 123
1,2-Dichlorobenzene	20.0	17.58		ug/L		88	68 - 120
1,4-Dichlorobenzene	20.0	17.84		ug/L		89	67 - 120
1,1-Dichloroethane	20.0	18.09		ug/L		90	71 - 123
1,2-Dichloroethane	20.0	19.12		ug/L		96	70 - 124
1,1-Dichloroethene	20.0	17.71		ug/L		89	61 - 129
1,2-Dichloropropane	20.0	17.32		ug/L		87	73 - 121
Ethylbenzene	20.0	17.68		ug/L		88	69 - 122
2-Hexanone	40.0	37.47		ug/L		94	60 - 132
Iodomethane	20.0	12.14		ug/L		61	10 - 150
Methylene chloride	20.0	17.42		ug/L		87	50 - 150
4-Methyl-2-pentanone (MIBK)	40.0	36.78		ug/L		92	62 - 130
Styrene	20.0	17.80		ug/L		89	67 - 125
1,1,1,2-Tetrachloroethane	20.0	15.68		ug/L		78	68 - 123
1,1,2,2-Tetrachloroethane	20.0	17.12		ug/L		86	64 - 124
Tetrachloroethene	20.0	17.35		ug/L		87	69 - 131
Toluene	20.0	17.90		ug/L		89	72 - 121
trans-1,4-Dichloro-2-butene	20.0	16.35		ug/L		82	48 - 150
trans-1,2-Dichloroethene	20.0	18.33		ug/L		92	68 - 125
trans-1,3-Dichloropropene	20.0	16.35		ug/L		82	68 - 124
1,1,1-Trichloroethane	20.0	18.58		ug/L		93	71 - 128
1,1,2-Trichloroethane	20.0	17.21		ug/L		86	70 - 124

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

Lab Sample ID: LCS 310-381097/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381097

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichloroethene	20.0	16.81		ug/L		84	73 - 126
1,2,3-Trichloropropane	20.0	17.43		ug/L		87	64 - 125
Vinyl acetate	40.0	32.55		ug/L		81	50 - 150
Xylenes, Total	40.0	34.24		ug/L		86	68 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*80 - 128*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCS 310-381097/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381097

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	17.80		ug/L		89	24 - 150
Chloroethane	20.0	18.00		ug/L		90	51 - 137
Chloromethane	20.0	16.80		ug/L		84	37 - 150
Trichlorofluoromethane	20.0	22.74		ug/L		114	56 - 144
Vinyl chloride	20.0	19.13		ug/L		96	57 - 136

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 128*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-381291/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381451 — **Prep Batch: 381291**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.000690	mg/L		03/15/23 09:45	03/15/23 20:26	1
Arsenic	<0.00200		0.00200	0.000750	mg/L		03/15/23 09:45	03/15/23 20:26	1
Barium	<0.00200		0.00200	0.000880	mg/L		03/15/23 09:45	03/15/23 20:26	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		03/15/23 09:45	03/15/23 20:26	1
Cadmium	<0.000100		0.000100	0.0000550	mg/L		03/15/23 09:45	03/15/23 20:26	1
Chromium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:26	1
Cobalt	<0.000500		0.000500	0.000190	mg/L		03/15/23 09:45	03/15/23 20:26	1
Copper	<0.00500		0.00500	0.00180	mg/L		03/15/23 09:45	03/15/23 20:26	1
Lead	<0.000500		0.000500	0.000240	mg/L		03/15/23 09:45	03/15/23 20:26	1
Nickel	<0.00500		0.00500	0.00190	mg/L		03/15/23 09:45	03/15/23 20:26	1
Selenium	<0.00500		0.00500	0.000960	mg/L		03/15/23 09:45	03/15/23 20:26	1
Silver	<0.00100		0.00100	0.000490	mg/L		03/15/23 09:45	03/15/23 20:26	1
Thallium	<0.00100		0.00100	0.000260	mg/L		03/15/23 09:45	03/15/23 20:26	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		03/15/23 09:45	03/15/23 20:26	1

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

Lab Sample ID: MB 310-381291/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381451 — **Prep Batch: 381291**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	<0.0200		0.0200	0.0100	mg/L		03/15/23 09:45	03/15/23 20:26	1

Lab Sample ID: LCS 310-381291/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381451 — **Prep Batch: 381291**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.1898		mg/L		95	80 - 120
Arsenic	0.200	0.1909		mg/L		95	80 - 120
Barium	0.100	0.09677		mg/L		97	80 - 120
Beryllium	0.100	0.09981		mg/L		100	80 - 120
Cadmium	0.100	0.09431		mg/L		94	80 - 120
Chromium	0.100	0.09218		mg/L		92	80 - 120
Cobalt	0.100	0.09250		mg/L		93	80 - 120
Copper	0.200	0.2003		mg/L		100	80 - 120
Lead	0.200	0.1956		mg/L		98	80 - 120
Nickel	0.200	0.1972		mg/L		99	80 - 120
Selenium	0.400	0.3840		mg/L		96	80 - 120
Silver	0.100	0.1016		mg/L		102	80 - 120
Thallium	0.200	0.1828		mg/L		91	80 - 120
Vanadium	0.100	0.09251		mg/L		93	80 - 120
Zinc	0.200	0.1760		mg/L		88	80 - 120

Lab Sample ID: 310-251201-1 MS — **Client Sample ID: MW-22**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381451 — **Prep Batch: 381291**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.00103	J F1	0.200	0.2151		mg/L		107	75 - 125
Arsenic	0.000840	J	0.200	0.2048		mg/L		102	75 - 125
Barium	0.251		0.100	0.3543		mg/L		104	75 - 125
Beryllium	<0.00100		0.100	0.1078		mg/L		108	75 - 125
Cadmium	0.000186		0.100	0.09928		mg/L		99	75 - 125
Chromium	<0.00500		0.100	0.09777		mg/L		98	75 - 125
Cobalt	0.000197	J	0.100	0.09645		mg/L		96	75 - 125
Copper	<0.00500		0.200	0.2089		mg/L		104	75 - 125
Lead	0.000369	J	0.200	0.2044		mg/L		102	75 - 125
Nickel	<0.00500		0.200	0.2076		mg/L		104	75 - 125
Selenium	0.00205	J	0.400	0.4175		mg/L		104	75 - 125
Silver	<0.00100		0.100	0.1050		mg/L		105	75 - 125
Thallium	0.000746	J	0.200	0.1716		mg/L		85	75 - 125
Vanadium	0.00133	J	0.100	0.09979		mg/L		98	75 - 125
Zinc	<0.0200		0.200	0.1899		mg/L		95	75 - 125

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

Lab Sample ID: 310-251201-1 MSD — **Client Sample ID: MW-22**
Matrix: Ground Water — **Prep Type: Total/NA**
Analysis Batch: 381451 — **Prep Batch: 381291**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	0.00103	J F1	0.200	0.2544	F1	mg/L		127	75 - 125	17	20
Arsenic	0.000840	J	0.200	0.2283		mg/L		114	75 - 125	11	20
Barium	0.251		0.100	0.3694		mg/L		119	75 - 125	4	20
Beryllium	<0.00100		0.100	0.1206		mg/L		121	75 - 125	11	20
Cadmium	0.000186		0.100	0.1133		mg/L		113	75 - 125	13	20
Chromium	<0.00500		0.100	0.1089		mg/L		109	75 - 125	11	20
Cobalt	0.000197	J	0.100	0.1078		mg/L		108	75 - 125	11	20
Copper	<0.00500		0.200	0.2390		mg/L		120	75 - 125	13	20
Lead	0.000369	J	0.200	0.2344		mg/L		117	75 - 125	14	20
Nickel	<0.00500		0.200	0.2296		mg/L		115	75 - 125	10	20
Selenium	0.00205	J	0.400	0.4643	E	mg/L		116	75 - 125	11	20
Silver	<0.00100		0.100	0.1037		mg/L		104	75 - 125	1	20
Thallium	0.000746	J	0.200	0.1942		mg/L		97	75 - 125	12	20
Vanadium	0.00133	J	0.100	0.1108		mg/L		109	75 - 125	10	20
Zinc	<0.0200		0.200	0.2133		mg/L		107	75 - 125	12	20

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-381175/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381175

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			03/13/23 14:52	1

Lab Sample ID: LCS 310-381175/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381175

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	116.0		mg/L		116	75 - 116

Lab Sample ID: MB 310-381206/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381206

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			03/14/23 07:04	1

Lab Sample ID: LCS 310-381206/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 381206

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	115.0		mg/L		115	75 - 116

QC Sample Results

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: MB 310-381258/1
Matrix: Water
Analysis Batch: 381258

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	1.70	mg/L			03/14/23 10:29	1

Lab Sample ID: LCS 310-381258/2
Matrix: Water
Analysis Batch: 381258

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	112.0		mg/L		112	75 - 116

QC Association Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

GC/MS VOA

Analysis Batch: 381097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251201-1	MW-22	Total/NA	Ground Water	8260D	
310-251201-2	MW-11	Total/NA	Ground Water	8260D	
310-251201-3	MW-23	Total/NA	Ground Water	8260D	
310-251201-4	MW-36	Total/NA	Ground Water	8260D	
310-251201-5	MW-DDS	Total/NA	Ground Water	8260D	
310-251201-6	Trip Blank 1	Total/NA	Water	8260D	
310-251201-7	Trip Blank 2	Total/NA	Water	8260D	
MB 310-381097/5	Method Blank	Total/NA	Water	8260D	
LCS 310-381097/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-381097/7	Lab Control Sample	Total/NA	Water	8260D	

Metals

Prep Batch: 381291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251201-1	MW-22	Total/NA	Ground Water	3005A	
310-251201-2	MW-11	Total/NA	Ground Water	3005A	
310-251201-3	MW-23	Total/NA	Ground Water	3005A	
310-251201-4	MW-36	Total/NA	Ground Water	3005A	
310-251201-5	MW-DDS	Total/NA	Ground Water	3005A	
MB 310-381291/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-381291/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-251201-1 MS	MW-22	Total/NA	Ground Water	3005A	
310-251201-1 MSD	MW-22	Total/NA	Ground Water	3005A	

Analysis Batch: 381451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251201-1	MW-22	Total/NA	Ground Water	6020B	381291
310-251201-2	MW-11	Total/NA	Ground Water	6020B	381291
310-251201-3	MW-23	Total/NA	Ground Water	6020B	381291
310-251201-4	MW-36	Total/NA	Ground Water	6020B	381291
310-251201-5	MW-DDS	Total/NA	Ground Water	6020B	381291
MB 310-381291/1-A	Method Blank	Total/NA	Water	6020B	381291
LCS 310-381291/2-A	Lab Control Sample	Total/NA	Water	6020B	381291
310-251201-1 MS	MW-22	Total/NA	Ground Water	6020B	381291
310-251201-1 MSD	MW-22	Total/NA	Ground Water	6020B	381291

General Chemistry

Analysis Batch: 381175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251201-4	MW-36	Total/NA	Ground Water	I-3765-85	
310-251201-5	MW-DDS	Total/NA	Ground Water	I-3765-85	
MB 310-381175/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-381175/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 381206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251201-1	MW-22	Total/NA	Ground Water	I-3765-85	
310-251201-2	MW-11	Total/NA	Ground Water	I-3765-85	
MB 310-381206/1	Method Blank	Total/NA	Water	I-3765-85	

General Chemistry (Continued)

Analysis Batch: 381206 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-381206/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 381258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-251201-3	MW-23	Total/NA	Ground Water	I-3765-85	
MB 310-381258/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-381258/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Lab Chronicle

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: MW-22
Lab Sample ID: 310-251201-1
Date Collected: 03/09/23 11:53
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 16:47
Total/NA	Prep	3005A			381291	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6020B		1	381451	A6US	EET CF	03/15/23 20:32
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-11
Lab Sample ID: 310-251201-2
Date Collected: 03/08/23 14:43
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 17:08
Total/NA	Prep	3005A			381291	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6020B		1	381451	A6US	EET CF	03/15/23 20:46
Total/NA	Analysis	I-3765-85		1	381206	DGU1	EET CF	03/14/23 07:04

Client Sample ID: MW-23
Lab Sample ID: 310-251201-3
Date Collected: 03/09/23 13:57
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 17:29
Total/NA	Prep	3005A			381291	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6020B		1	381451	A6US	EET CF	03/15/23 20:49
Total/NA	Analysis	I-3765-85		1	381258	DGU1	EET CF	03/14/23 10:29

Client Sample ID: MW-36
Lab Sample ID: 310-251201-4
Date Collected: 03/10/23 10:25
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 17:51
Total/NA	Prep	3005A			381291	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6020B		1	381451	A6US	EET CF	03/15/23 21:12
Total/NA	Analysis	I-3765-85		1	381175	D7CP	EET CF	03/13/23 14:52

Client Sample ID: MW-DDS
Lab Sample ID: 310-251201-5
Date Collected: 03/10/23 10:25
Matrix: Ground Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 18:12
Total/NA	Prep	3005A			381291	QTZ5	EET CF	03/15/23 09:45
Total/NA	Analysis	6020B		1	381451	A6US	EET CF	03/15/23 21:15
Total/NA	Analysis	I-3765-85		1	381175	D7CP	EET CF	03/13/23 14:52

Lab Chronicle

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Client Sample ID: Trip Blank 1

Lab Sample ID: 310-251201-6

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 13:13

Client Sample ID: Trip Blank 2

Lab Sample ID: 310-251201-7

Date Collected: 03/08/23 00:00
Matrix: Water
Date Received: 03/10/23 16:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	381097	WSE8	EET CF	03/13/23 13:34

Laboratory References:

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

Accreditation/Certification Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

Method Summary

Client: Evora Consulting
Project/Site: Cass County Sanitary Landfill(Spring 2023 HMSP DS)

Job ID: 310-251201-1
SDG: 27223098 Task 1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF

Protocol References:

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:

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

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310-251201 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Evora

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 3/10/23 | TIME 1615 | Received By: AM

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? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: ☐ NONE

Thermometer ID: W | Correction Factor (°C): 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(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

MW22
MW11
MW23

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Evora

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 3/10/23 | TIME 1615 | Received By: AM

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 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: W | Correction Factor (°C): 0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 0.8 | Corrected Temp (°C): 0.8

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

MW. 36

MW DDS

TestAmerica

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792.7989 (fax)

SAMPLER: ~~[illegible]~~ / Konner Roth

SITE NAME: Cass County Sanitary Landfill

ADDRESS: 1690 all State Ct Ste 100

CITY/STATE/ZIP: West Des Moines, IA, 50265

TELEPHONE NUMBER: Fax:

SAMPLED BY: (PRINT NAME) Konner Roth

SIGNATURE Konner Roth

REPORT TO:

NAME: Ben Madson

COMPANY NAME: SCS Engineers

PROJECT NAME Cass County Sanitary Landfill (Spring 2023 HMSP DS)

PROJECT NUMBER: 27223098 Task 1

ADDRESS: 1690 All State Ct, Ste 100

CITY/STATE/ZIP: West Des Moines, IA 50265

								Preservative								Matrix						Analyze For:											
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	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)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Appendix I	Appendix II	Total Suspended Solids	Trip Blank								Fax Results
MW-22		3/9/23	1153		X			X								X						X		X									
MW 11		3/8/23	1443		X			X								X						X		X									
MW-23		3/9/23	1357		X			X								X						X		X									
MW-36	3/10/23	~~3/9/23~~	1025		X			X								X						X		X									
MW-DDS	3/10/23	~~3/9/23~~	1025		X			X								X						X		X									
Trip Blank	1														X						X				X								

Relinquished by:	Date	Time	Received by	Date:	Time	Relinquished by:	Time
Konner Roth	3/10/23	14:00					

Shipped Via	Comments:	Shipped Via
	Temperature Upon Receipt	

Received for lab by:	Date:	Time:
Ginger Muehling	3/10/23	16:15

Laboratory Comments: (1) For Appendix and analysis report to the reporting limits, not the detection limits. Make sure that the reporting limits are below the EPA's MCLs.
(2) For analysis other than Appendix and report to the detection limits. Please make sure that the detection limits are below the EPA's MCLs.
(3) In the "Result" column for all EDD files when non-detect, please report the reporting limits or the detection limits instead of indicating with "ND"

Login Sample Receipt Checklist

Client: Evora Consulting

Job Number: 310-251201-1
SDG Number: 27223098 Task 1

Login Number: 251201
List Number: 1
Creator: Muehling, Angela C

List Source: Eurofins 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.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Ben Madson
SCS Engineers
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

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JOB DESCRIPTION

Cass County Sanitary Landfill (July Retest)
SDG NUMBER 27223098.24

JOB NUMBER

310-261009-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

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The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Authorized for release by
Meredith Liechti, Service Center Manager
meredith.liechti@et.eurofinsus.com
(319)277-2401

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Job ID: 310-261009-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-261009-1

Receipt
The sample was received on 7/24/2023 4:30 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.2°C

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

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

Sample Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-261009-1	MW-43	Water	07/21/23 12:47	07/24/23 16:30

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Client Sample ID: MW-43 — Lab Sample ID: 310-261009-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	47.5		3.75	1.28	mg/L	1		I-3765-85	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Client Sample ID: MW-43

Date Collected: 07/21/23 12:47
Date Received: 07/24/23 16:30

Lab Sample ID: 310-261009-1

Matrix: Water

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.00500		0.00500	0.00140	mg/L		07/27/23 09:50	08/07/23 19:13	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	47.5		3.75	1.28	mg/L			07/25/23 11:34	1

Glossary

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

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-394863/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 395841 — **Prep Batch: 394863**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.00500		0.00500	0.00140	mg/L		07/27/23 09:50	08/07/23 19:06	1

Lab Sample ID: LCS 310-394863/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 395841 — **Prep Batch: 394863**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Selenium	0.400	0.3879		mg/L		97	80 - 120

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-394614/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 394614

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			07/25/23 11:34	1

Lab Sample ID: LCS 310-394614/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 394614

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	102.0		mg/L		102	75 - 116

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Metals

Prep Batch: 394863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261009-1	MW-43	Total/NA	Water	3005A	
MB 310-394863/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-394863/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 395841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261009-1	MW-43	Total/NA	Water	6020B	394863
MB 310-394863/1-A	Method Blank	Total/NA	Water	6020B	394863
LCS 310-394863/2-A	Lab Control Sample	Total/NA	Water	6020B	394863

General Chemistry

Analysis Batch: 394614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-261009-1	MW-43	Total/NA	Water	I-3765-85	
MB 310-394614/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-394614/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Client Sample ID: MW-43

Date Collected: 07/21/23 12:47
Date Received: 07/24/23 16:30

Lab Sample ID: 310-261009-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			394863	DHM5	EET CF	07/27/23 09:50
Total/NA	Analysis	6020B		1	395841	A6US	EET CF	08/07/23 19:13
Total/NA	Analysis	I-3765-85		1	394614	DGU1	EET CF	07/25/23 11:34

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

Method Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (July Retest)

Job ID: 310-261009-1
SDG: 27223098.24

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

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:

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

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310-261009 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received. DATE 7/24/23 TIME 1630 | Received By: AM

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 # _____ 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: T | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.2 | Corrected Temp (°C): 2.2

• **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

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER: SCS Engineers
SITE NAME: Cass County Sanitary Landfill
ADDRESS:
CITY/STATE/ZIP:
TELEPHONE NUMBER: Fax:
SAMPLED BY: (PRINT NAME) Scott Stoller
SIGNATURE: Scott Stoller

REPORT TO:
NAME: Ben Madson
COMPANY NAME: SCS Engineers
PROJECT NAME: Cass County Sanitary Landfill (July Retest)
PROJECT NUMBER: 27223098 24
ADDRESS: 1690 All State Ct, Ste 100
CITY/STATE/ZIP: West Des Moines IA 50265

								Preservative								Matrix						Analyze For:											
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	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)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Selenium	Total Suspended Solids											Fax Results
MW-43		7/21	12:47		X			X								X						X	X										

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Relinquished by:	Time:
Scott Stoller	7/24/23	10:00					
Shipped Via			Comments:			Shipped Via	
Received for lab by: Angie Muehring	Date: 7/24/23	Time: 1630	Temperature Upon Receipt:				

Laboratory Comments: (1) For Appendix I and I analyses, report to the reporting limits, not the detection limits. Make sure that the reporting limits are below the EPA's MCLs.
(2) For analysis other than Appendix and report to the detection limits. Please make sure that the detection limits are below the EPA MCLs.
(3) In the "Result" column for al EDD files, when non-detect, please report "<" the reporting limits or the detection limits instead of indicating with "ND"

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-261009-1
SDG Number: 27223098.24

Login Number: 261009
List Number: 1
Creator: Muehling, Angela C

List Source: Eurofins 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.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Ben Madson
SCS Engineers
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

Generated 10/11/2023 2:37:42 PM Revision 1

JOB DESCRIPTION

Cass County Sanitary Landfill (Fall 2023 WT HMSP
SDG NUMBER 27223236.24

JOB NUMBER

310-264988-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Revision 1

Authorized for release by
Meredith Liechti, Service Center Manager
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(319)277-2401

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Job ID: 310-264988-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-264988-1

REVISION

The report being provided is a revision of the original report sent on 10/10/2023. The report (revision 1) is being revised due to Compound 2,4,5-TP [Silvex] for Herbicides removed from report.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 9/15/2023 4:20 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9°C, 1.9°C and 2.5°C

Receipt Exceptions
The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. ICOC sample #3 list 1 container however received 3. Correct container received fir requested analysis.

GC/MS VOA
Method 8260D: The following sample was collected in a properly preserved vial; however, the pH was outside the required criteria when verified by the laboratory. The sample was analyzed within the 7-day holding time specified for unpreserved samples: MW-20 (310-264988-3).

Method 8260D: The following volatiles sample was diluted due to foaming at the time of sample analysis during the original sample analysis: UD-0 (310-264988-10). 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.

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

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

Metals
Method 6020B: The following sample was diluted due to the nature of the sample matrix: MW-20 (310-264988-3). 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 additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-264988-1	MW-15R	Water	09/13/23 18:50	09/15/23 16:20
310-264988-2	MW-19	Water	09/14/23 13:02	09/15/23 16:20
310-264988-3	MW-20	Water	09/14/23 14:02	09/15/23 16:20
310-264988-4	MW-21	Water	09/13/23 14:12	09/15/23 16:20
310-264988-5	MW-24	Water	09/13/23 12:24	09/15/23 16:20
310-264988-6	MW-37R	Water	09/13/23 13:13	09/15/23 16:20
310-264988-7	MW-38R	Water	09/13/23 15:39	09/15/23 16:20
310-264988-8	MW-39	Water	09/13/23 09:50	09/15/23 16:20
310-264988-9	MW-43	Water	09/13/23 16:50	09/15/23 16:20
310-264988-10	UD-0	Water	09/13/23 10:00	09/15/23 16:20
310-264988-11	MW-DWT	Water	09/13/23 09:50	09/15/23 16:20
310-264988-12	Trip Blank	Water	09/13/23 00:00	09/15/23 16:20

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-15R — Lab Sample ID: 310-264988-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	3.18	J	10.0	3.10	ug/L	1		8260D	Total/NA
Antimony	0.00165	J	0.00200	0.00100	mg/L	1		6020B	Total/NA
Arsenic	0.000640	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.306		0.00200	0.000640	mg/L	1		6020B	Total/NA
Total Suspended Solids	21.8		3.75	1.28	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-19 — Lab Sample ID: 310-264988-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	5.58	J	10.0	3.10	ug/L	1		8260D	Total/NA
Benzene	0.733		0.500	0.220	ug/L	1		8260D	Total/NA
Chlorobenzene	1.49		1.00	0.400	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.287	J	1.00	0.210	ug/L	1		8260D	Total/NA
1,4-Dichlorobenzene	0.280	J	1.00	0.230	ug/L	1		8260D	Total/NA
1,1-Dichloroethane	0.611	J	1.00	0.220	ug/L	1		8260D	Total/NA
Arsenic	0.00163	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	1.24		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cobalt	0.0238		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.0431		0.00500	0.00190	mg/L	1		6020B	Total/NA
Total Suspended Solids	3.75		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-20 — Lab Sample ID: 310-264988-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	8.10	J	10.0	3.10	ug/L	1		8260D	Total/NA
Benzene	2.93		0.500	0.220	ug/L	1		8260D	Total/NA
Chlorobenzene	4.34		1.00	0.400	ug/L	1		8260D	Total/NA
cis-1,2-Dichloroethene	0.406	J	1.00	0.210	ug/L	1		8260D	Total/NA
1,4-Dichlorobenzene	2.48		1.00	0.230	ug/L	1		8260D	Total/NA
Toluene	0.790	J	1.00	0.430	ug/L	1		8260D	Total/NA
Arsenic	0.0800		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	3.32		0.00800	0.00256	mg/L	4		6020B	Total/NA
Chromium	0.00138	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.0131		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.0487		0.00500	0.00190	mg/L	1		6020B	Total/NA
Vanadium	0.00368	J B	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	151		15.0	5.10	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-21 — Lab Sample ID: 310-264988-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00153	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	1.24		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cobalt	0.00468		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.00444	J	0.00500	0.00190	mg/L	1		6020B	Total/NA
Total Suspended Solids	4.50		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-24 — Lab Sample ID: 310-264988-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorobenzene	0.499	J	1.00	0.400	ug/L	1		8260D	Total/NA
1,1-Dichloroethane	0.415	J	1.00	0.220	ug/L	1		8260D	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-24 (Continued) — Lab Sample ID: 310-264988-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00142	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.712		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cadmium	0.000776		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.00323		0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.0239		0.00500	0.00190	mg/L	1		6020B	Total/NA
Total Suspended Solids	45.0		3.75	1.28	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-37R — Lab Sample ID: 310-264988-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	3.23	J	10.0	3.10	ug/L	1		8260D	Total/NA
Arsenic	0.000637	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.693		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cadmium	0.000205		0.000200	0.000100	mg/L	1		6020B	Total/NA
Chromium	0.00465	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.00121		0.000500	0.000170	mg/L	1		6020B	Total/NA
Lead	0.00135		0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.0127		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.0558		0.00500	0.00140	mg/L	1		6020B	Total/NA
Vanadium	0.00220	J B	0.00500	0.00110	mg/L	1		6020B	Total/NA
Zinc	0.00727	J	0.0200	0.00640	mg/L	1		6020B	Total/NA
Total Suspended Solids	100		3.75	1.28	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-38R — Lab Sample ID: 310-264988-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	4.34	J	10.0	3.10	ug/L	1		8260D	Total/NA
Barium	0.212		0.00200	0.000640	mg/L	1		6020B	Total/NA
Chromium	0.00375	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.000185	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Nickel	0.00409	J	0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.0264		0.00500	0.00140	mg/L	1		6020B	Total/NA
Total Suspended Solids	3.75		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-39 — Lab Sample ID: 310-264988-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	4.76	J	10.0	3.10	ug/L	1		8260D	Total/NA
Barium	0.0868		0.00200	0.000640	mg/L	1		6020B	Total/NA
Chromium	0.00124	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Selenium	0.0719		0.00500	0.00140	mg/L	1		6020B	Total/NA
Vanadium	0.00119	J B	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	1.25	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-43 — Lab Sample ID: 310-264988-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	4.57	J	10.0	3.10	ug/L	1		8260D	Total/NA
Arsenic	0.00242		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.348		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cadmium	0.000240		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.0130		0.000500	0.000170	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-43 (Continued) — Lab Sample ID: 310-264988-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nickel	0.00590		0.00500	0.00190	mg/L	1		6020B	Total/NA
Vanadium	0.00219	J B	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	25.0		3.75	1.28	mg/L	1		I-3765-85	Total/NA

Client Sample ID: UD-0 — Lab Sample ID: 310-264988-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00225		0.00200	0.00100	mg/L	1		6020B	Total/NA
Arsenic	0.00344		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.940		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cadmium	0.000305		0.000200	0.000100	mg/L	1		6020B	Total/NA
Chromium	0.00768		0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.0278		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.0186		0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000680		0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.128		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00366	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Vanadium	0.00306	J B	0.00500	0.00110	mg/L	1		6020B	Total/NA
Zinc	0.00874	J	0.0200	0.00640	mg/L	1		6020B	Total/NA
Total Suspended Solids	5.75		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-DWT — Lab Sample ID: 310-264988-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00101	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0918		0.00200	0.000640	mg/L	1		6020B	Total/NA
Beryllium	0.000364	J	0.00100	0.000330	mg/L	1		6020B	Total/NA
Cadmium	0.000319		0.000200	0.000100	mg/L	1		6020B	Total/NA
Chromium	0.00303	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.000308	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Lead	0.000721		0.000500	0.000240	mg/L	1		6020B	Total/NA
Selenium	0.0782		0.00500	0.00140	mg/L	1		6020B	Total/NA
Thallium	0.00563		0.00100	0.000260	mg/L	1		6020B	Total/NA
Vanadium	0.00643		0.00500	0.00110	mg/L	1		6020B	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 310-264988-12

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-15R

Date Collected: 09/13/23 18:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-1

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**3.18**	**J**	10.0	3.10	ug/L			09/18/23 23:40	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/18/23 23:40	1
Benzene	<0.500		0.500	0.220	ug/L			09/18/23 23:40	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/18/23 23:40	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/18/23 23:40	1
Bromoform	<5.00		5.00	0.780	ug/L			09/18/23 23:40	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/18/23 23:40	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/18/23 23:40	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/18/23 23:40	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/18/23 23:40	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/18/23 23:40	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/18/23 23:40	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/18/23 23:40	1
Chloroform	<3.00		3.00	1.30	ug/L			09/18/23 23:40	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/18/23 23:40	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/18/23 23:40	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/18/23 23:40	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/18/23 23:40	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/18/23 23:40	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/18/23 23:40	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/18/23 23:40	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/18/23 23:40	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/18/23 23:40	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/18/23 23:40	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/18/23 23:40	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/18/23 23:40	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/18/23 23:40	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/18/23 23:40	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/18/23 23:40	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/18/23 23:40	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/18/23 23:40	1
Styrene	<1.00		1.00	0.370	ug/L			09/18/23 23:40	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/18/23 23:40	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/18/23 23:40	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/18/23 23:40	1
Toluene	<1.00		1.00	0.430	ug/L			09/18/23 23:40	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/18/23 23:40	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/18/23 23:40	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/18/23 23:40	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/18/23 23:40	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/18/23 23:40	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/18/23 23:40	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/18/23 23:40	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/18/23 23:40	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/18/23 23:40	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/18/23 23:40	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/18/23 23:40	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-15R

Date Collected: 09/13/23 18:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-1

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*09/18/23 23:40*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 128*		*09/18/23 23:40*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*09/18/23 23:40*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00165**	**J**	0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:21	1
Arsenic	**0.000640**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:29	1
Barium	**0.306**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:29	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:29	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:29	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:29	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:29	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:29	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:29	1
Nickel	<0.00500		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 21:26	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:29	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:29	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:29	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:29	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**21.8**		3.75	1.28	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-19

Date Collected: 09/14/23 13:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-2

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**5.58**	**J**	10.0	3.10	ug/L			09/19/23 00:02	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 00:02	1
Benzene	**0.733**		0.500	0.220	ug/L			09/19/23 00:02	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 00:02	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 00:02	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 00:02	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 00:02	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 00:02	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 00:02	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 00:02	1
Chlorobenzene	**1.49**		1.00	0.400	ug/L			09/19/23 00:02	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 00:02	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 00:02	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 00:02	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 00:02	1
cis-1,2-Dichloroethene	**0.287**	**J**	1.00	0.210	ug/L			09/19/23 00:02	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 00:02	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 00:02	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 00:02	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 00:02	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 00:02	1
1,4-Dichlorobenzene	**0.280**	**J**	1.00	0.230	ug/L			09/19/23 00:02	1
1,1-Dichloroethane	**0.611**	**J**	1.00	0.220	ug/L			09/19/23 00:02	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 00:02	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 00:02	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 00:02	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 00:02	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 00:02	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 00:02	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 00:02	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 00:02	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 00:02	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 00:02	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 00:02	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 00:02	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 00:02	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 00:02	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 00:02	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 00:02	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 00:02	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 00:02	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 00:02	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 00:02	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 00:02	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 00:02	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 00:02	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 00:02	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-19

Date Collected: 09/14/23 13:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-2

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*09/19/23 00:02*	*1*
Dibromofluoromethane (Surr)	*110*		*80 - 128*		*09/19/23 00:02*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/19/23 00:02*	*1*

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane, gamma	<2.00		2.00	0.810	ug/L		09/19/23 11:10	09/25/23 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*63*		*10 - 136*	*09/19/23 11:10*	*09/25/23 16:08*	*1*
Tetrachloro-m-xylene	*53*		*10 - 130*	*09/19/23 11:10*	*09/25/23 16:08*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:34	1
Arsenic	**0.00163**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:32	1
Barium	**1.24**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:32	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:32	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:32	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:32	1
Cobalt	**0.0238**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:32	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:32	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:32	1
Nickel	**0.0431**		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 21:29	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:32	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:32	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:32	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:32	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		09/19/23 18:07	09/19/23 22:44	1
Total Suspended Solids (USGS I-3765-85)	**3.75**		1.88	0.638	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-20

Date Collected: 09/14/23 14:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-3

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**8.10**	**J**	10.0	3.10	ug/L			09/19/23 04:45	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 04:45	1
Benzene	**2.93**		0.500	0.220	ug/L			09/19/23 04:45	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 04:45	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 04:45	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 04:45	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 04:45	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 04:45	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 04:45	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 04:45	1
Chlorobenzene	**4.34**		1.00	0.400	ug/L			09/19/23 04:45	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 04:45	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 04:45	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 04:45	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 04:45	1
cis-1,2-Dichloroethene	**0.406**	**J**	1.00	0.210	ug/L			09/19/23 04:45	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 04:45	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 04:45	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 04:45	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 04:45	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 04:45	1
1,4-Dichlorobenzene	**2.48**		1.00	0.230	ug/L			09/19/23 04:45	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 04:45	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 04:45	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 04:45	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 04:45	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 04:45	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 04:45	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 04:45	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 04:45	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 04:45	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 04:45	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 04:45	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 04:45	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 04:45	1
Toluene	**0.790**	**J**	1.00	0.430	ug/L			09/19/23 04:45	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 04:45	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 04:45	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 04:45	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 04:45	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 04:45	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 04:45	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 04:45	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 04:45	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 04:45	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 04:45	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 04:45	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-20

Date Collected: 09/14/23 14:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-3

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*09/19/23 04:45*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 128*		*09/19/23 04:45*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/19/23 04:45*	*1*

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Endosulfan I	<0.0640		0.0640	0.0330	ug/L		09/19/23 11:10	09/25/23 16:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*42*		*10 - 136*	*09/19/23 11:10*	*09/25/23 16:21*	*1*
Tetrachloro-m-xylene	*51*		*10 - 130*	*09/19/23 11:10*	*09/25/23 16:21*	*1*

Method: SW846 8151A - Herbicides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	<0.994		0.994	0.143	ug/L		09/20/23 16:09	09/27/23 18:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*83*		*25 - 130*	*09/20/23 16:09*	*09/27/23 18:32*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00800		0.00800	0.00400	mg/L		09/19/23 09:30	10/03/23 16:39	4
Arsenic	**0.0800**		0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:36	1
Barium	**3.32**		0.00800	0.00256	mg/L		09/19/23 09:30	10/03/23 16:39	4
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:36	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:36	1
Chromium	**0.00138**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:36	1
Cobalt	**0.0131**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:36	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:36	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:36	1
Nickel	**0.0487**		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 21:51	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:36	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:36	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:36	1
Vanadium	**0.00368**	**J B**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:36	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		09/19/23 18:11	09/19/23 22:50	1
Total Suspended Solids (USGS I-3765-85)	**151**		15.0	5.10	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-21

Date Collected: 09/13/23 14:12
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-4

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 00:23	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 00:23	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 00:23	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 00:23	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 00:23	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 00:23	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 00:23	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 00:23	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 00:23	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 00:23	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 00:23	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 00:23	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 00:23	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 00:23	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 00:23	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 00:23	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 00:23	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 00:23	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 00:23	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 00:23	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 00:23	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 00:23	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 00:23	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 00:23	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 00:23	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 00:23	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 00:23	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 00:23	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 00:23	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 00:23	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 00:23	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 00:23	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 00:23	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 00:23	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 00:23	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 00:23	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 00:23	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 00:23	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 00:23	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 00:23	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 00:23	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 00:23	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 00:23	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 00:23	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 00:23	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 00:23	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 00:23	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-21

Date Collected: 09/13/23 14:12
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-4

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*09/19/23 00:23*	*1*
Dibromofluoromethane (Surr)	*115*		*80 - 128*		*09/19/23 00:23*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*09/19/23 00:23*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:41	1
Arsenic	**0.00153**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:38	1
Barium	**1.24**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:38	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:38	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:38	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:38	1
Cobalt	**0.00468**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:38	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:38	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:38	1
Nickel	**0.00444**	**J**	0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 21:54	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:38	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:38	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:38	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:38	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide (SW846 9034)	<1.00		1.00	0.231	mg/L		09/19/23 18:15	09/19/23 22:56	1
Total Suspended Solids (USGS I-3765-85)	**4.50**		1.88	0.638	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-24

Date Collected: 09/13/23 12:24
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-5

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 00:45	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 00:45	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 00:45	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 00:45	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 00:45	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 00:45	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 00:45	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 00:45	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 00:45	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 00:45	1
Chlorobenzene	**0.499**	**J**	1.00	0.400	ug/L			09/19/23 00:45	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 00:45	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 00:45	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 00:45	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 00:45	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 00:45	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 00:45	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 00:45	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 00:45	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 00:45	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 00:45	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 00:45	1
1,1-Dichloroethane	**0.415**	**J**	1.00	0.220	ug/L			09/19/23 00:45	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 00:45	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 00:45	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 00:45	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 00:45	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 00:45	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 00:45	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 00:45	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 00:45	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 00:45	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 00:45	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 00:45	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 00:45	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 00:45	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 00:45	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 00:45	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 00:45	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 00:45	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 00:45	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 00:45	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 00:45	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 00:45	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 00:45	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 00:45	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 00:45	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-24

Date Collected: 09/13/23 12:24
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-5

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*09/19/23 00:45*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 128*		*09/19/23 00:45*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*09/19/23 00:45*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:43	1
Arsenic	**0.00142**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:41	1
Barium	**0.712**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:41	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:41	1
Cadmium	**0.000776**		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:41	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:41	1
Cobalt	**0.00323**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:41	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:41	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:41	1
Nickel	**0.0239**		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 21:57	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:41	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:41	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:41	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:41	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**45.0**		3.75	1.28	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-37R

Date Collected: 09/13/23 13:13
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-6

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**3.23**	**J**	10.0	3.10	ug/L			09/19/23 01:07	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 01:07	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 01:07	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 01:07	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 01:07	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 01:07	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 01:07	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 01:07	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 01:07	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 01:07	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 01:07	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 01:07	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 01:07	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 01:07	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 01:07	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 01:07	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 01:07	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 01:07	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 01:07	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 01:07	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 01:07	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 01:07	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 01:07	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 01:07	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 01:07	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 01:07	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 01:07	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 01:07	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 01:07	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 01:07	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 01:07	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 01:07	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 01:07	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 01:07	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 01:07	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 01:07	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 01:07	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 01:07	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 01:07	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 01:07	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 01:07	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 01:07	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 01:07	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 01:07	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 01:07	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 01:07	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 01:07	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-37R

Date Collected: 09/13/23 13:13
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-6

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*09/19/23 01:07*	*1*
Dibromofluoromethane (Surr)	*111*		*80 - 128*		*09/19/23 01:07*	*1*
Toluene-d8 (Surr)	*95*		*80 - 120*		*09/19/23 01:07*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:45	1
Arsenic	**0.000637**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:53	1
Barium	**0.693**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:53	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:53	1
Cadmium	**0.000205**		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:53	1
Chromium	**0.00465**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:53	1
Cobalt	**0.00121**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:53	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:53	1
Lead	**0.00135**		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:53	1
Nickel	**0.0127**		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 22:00	1
Selenium	**0.0558**		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:53	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:53	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:53	1
Vanadium	**0.00220**	**J B**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:53	1
Zinc	**0.00727**	**J**	0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**100**		3.75	1.28	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-38R

Date Collected: 09/13/23 15:39
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-7

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.34**	**J**	10.0	3.10	ug/L			09/19/23 01:29	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 01:29	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 01:29	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 01:29	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 01:29	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 01:29	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 01:29	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 01:29	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 01:29	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 01:29	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 01:29	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 01:29	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 01:29	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 01:29	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 01:29	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 01:29	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 01:29	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 01:29	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 01:29	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 01:29	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 01:29	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 01:29	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 01:29	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 01:29	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 01:29	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 01:29	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 01:29	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 01:29	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 01:29	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 01:29	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 01:29	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 01:29	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 01:29	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 01:29	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 01:29	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 01:29	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 01:29	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 01:29	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 01:29	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 01:29	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 01:29	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 01:29	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 01:29	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 01:29	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 01:29	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 01:29	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 01:29	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-38R

Date Collected: 09/13/23 15:39
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-7

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*09/19/23 01:29*	*1*
Dibromofluoromethane (Surr)	*111*		*80 - 128*		*09/19/23 01:29*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/19/23 01:29*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:48	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:55	1
Barium	**0.212**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:55	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:55	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:55	1
Chromium	**0.00375**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:55	1
Cobalt	**0.000185**	**J**	0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:55	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:55	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:55	1
Nickel	**0.00409**	**J**	0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 22:03	1
Selenium	**0.0264**		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:55	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:55	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:55	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:55	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**3.75**		1.88	0.638	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-39

Date Collected: 09/13/23 09:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-8

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.76**	**J**	10.0	3.10	ug/L			09/19/23 01:51	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 01:51	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 01:51	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 01:51	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 01:51	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 01:51	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 01:51	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 01:51	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 01:51	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 01:51	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 01:51	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 01:51	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 01:51	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 01:51	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 01:51	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 01:51	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 01:51	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 01:51	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 01:51	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 01:51	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 01:51	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 01:51	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 01:51	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 01:51	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 01:51	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 01:51	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 01:51	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 01:51	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 01:51	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 01:51	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 01:51	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 01:51	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 01:51	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 01:51	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 01:51	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 01:51	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 01:51	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 01:51	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 01:51	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 01:51	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 01:51	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 01:51	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 01:51	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 01:51	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 01:51	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 01:51	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 01:51	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-39

Date Collected: 09/13/23 09:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-8

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*09/19/23 01:51*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 128*		*09/19/23 01:51*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/19/23 01:51*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:50	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 19:57	1
Barium	**0.0868**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 19:57	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 19:57	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 19:57	1
Chromium	**0.00124**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:57	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 19:57	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 19:57	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 19:57	1
Nickel	<0.00500		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 22:06	1
Selenium	**0.0719**		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 19:57	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 19:57	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 19:57	1
Vanadium	**0.00119**	**J B**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 19:57	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 19:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**1.25**	**J**	1.88	0.638	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-43

Date Collected: 09/13/23 16:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-9

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	**4.57**	**J**	10.0	3.10	ug/L			09/19/23 02:12	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 02:12	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 02:12	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 02:12	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 02:12	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 02:12	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 02:12	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 02:12	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 02:12	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 02:12	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 02:12	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 02:12	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 02:12	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 02:12	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 02:12	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 02:12	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 02:12	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 02:12	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 02:12	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 02:12	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 02:12	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 02:12	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 02:12	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 02:12	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 02:12	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 02:12	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 02:12	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 02:12	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 02:12	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 02:12	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 02:12	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 02:12	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 02:12	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 02:12	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 02:12	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 02:12	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 02:12	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 02:12	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 02:12	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 02:12	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 02:12	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 02:12	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 02:12	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 02:12	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 02:12	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 02:12	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 02:12	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-43

Date Collected: 09/13/23 16:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-9

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*09/19/23 02:12*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 128*		*09/19/23 02:12*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/19/23 02:12*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 16:52	1
Arsenic	**0.00242**		0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 20:00	1
Barium	**0.348**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 20:00	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 20:00	1
Cadmium	**0.000240**		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 20:00	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 20:00	1
Cobalt	**0.0130**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 20:00	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 20:00	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 20:00	1
Nickel	**0.00590**		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 22:08	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 20:00	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 20:00	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 20:00	1
Vanadium	**0.00219**	**J B**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 20:00	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 20:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**25.0**		3.75	1.28	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: UD-0

Date Collected: 09/13/23 10:00
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-10

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<100		100	31.0	ug/L			09/19/23 05:07	10
Acrylonitrile	<50.0		50.0	22.0	ug/L			09/19/23 05:07	10
Benzene	<5.00		5.00	2.20	ug/L			09/19/23 05:07	10
Bromochloromethane	<50.0		50.0	5.40	ug/L			09/19/23 05:07	10
Bromodichloromethane	<10.0		10.0	3.90	ug/L			09/19/23 05:07	10
Bromoform	<50.0		50.0	7.80	ug/L			09/19/23 05:07	10
Bromomethane	<40.0		40.0	11.0	ug/L			09/19/23 05:07	10
2-Butanone (MEK)	<100		100	21.0	ug/L			09/19/23 05:07	10
Carbon disulfide	<10.0		10.0	4.50	ug/L			09/19/23 05:07	10
Carbon tetrachloride	<20.0		20.0	6.50	ug/L			09/19/23 05:07	10
Chlorobenzene	<10.0		10.0	4.00	ug/L			09/19/23 05:07	10
Chlorodibromomethane	<50.0		50.0	7.50	ug/L			09/19/23 05:07	10
Chloroethane	<40.0		40.0	7.90	ug/L			09/19/23 05:07	10
Chloroform	<30.0		30.0	13.0	ug/L			09/19/23 05:07	10
Chloromethane	<30.0		30.0	6.10	ug/L			09/19/23 05:07	10
cis-1,2-Dichloroethene	<10.0		10.0	2.10	ug/L			09/19/23 05:07	10
cis-1,3-Dichloropropene	<50.0		50.0	2.50	ug/L			09/19/23 05:07	10
1,2-Dibromo-3-chloropropane	<50.0		50.0	12.0	ug/L			09/19/23 05:07	10
1,2-Dibromoethane (EDB)	<10.0		10.0	3.40	ug/L			09/19/23 05:07	10
Dibromomethane	<10.0		10.0	3.30	ug/L			09/19/23 05:07	10
1,2-Dichlorobenzene	<10.0		10.0	3.70	ug/L			09/19/23 05:07	10
1,4-Dichlorobenzene	<10.0		10.0	2.30	ug/L			09/19/23 05:07	10
1,1-Dichloroethane	<10.0		10.0	2.20	ug/L			09/19/23 05:07	10
1,2-Dichloroethane	<10.0		10.0	3.90	ug/L			09/19/23 05:07	10
1,1-Dichloroethene	<20.0		20.0	5.60	ug/L			09/19/23 05:07	10
1,2-Dichloropropane	<10.0		10.0	2.70	ug/L			09/19/23 05:07	10
Ethylbenzene	<10.0		10.0	3.10	ug/L			09/19/23 05:07	10
2-Hexanone	<100		100	20.0	ug/L			09/19/23 05:07	10
Iodomethane	<100		100	70.0	ug/L			09/19/23 05:07	10
Methylene chloride	<50.0		50.0	17.0	ug/L			09/19/23 05:07	10
4-Methyl-2-pentanone (MIBK)	<100		100	21.0	ug/L			09/19/23 05:07	10
Styrene	<10.0		10.0	3.70	ug/L			09/19/23 05:07	10
1,1,1,2-Tetrachloroethane	<10.0		10.0	3.80	ug/L			09/19/23 05:07	10
1,1,2,2-Tetrachloroethane	<10.0		10.0	4.70	ug/L			09/19/23 05:07	10
Tetrachloroethene	<10.0		10.0	4.80	ug/L			09/19/23 05:07	10
Toluene	<10.0		10.0	4.30	ug/L			09/19/23 05:07	10
trans-1,4-Dichloro-2-butene	<100		100	11.0	ug/L			09/19/23 05:07	10
trans-1,2-Dichloroethene	<10.0		10.0	2.70	ug/L			09/19/23 05:07	10
trans-1,3-Dichloropropene	<50.0		50.0	5.60	ug/L			09/19/23 05:07	10
1,1,1-Trichloroethane	<10.0		10.0	1.90	ug/L			09/19/23 05:07	10
1,1,2-Trichloroethane	<10.0		10.0	4.50	ug/L			09/19/23 05:07	10
Trichloroethene	<10.0		10.0	4.30	ug/L			09/19/23 05:07	10
Trichlorofluoromethane	<40.0		40.0	3.80	ug/L			09/19/23 05:07	10
1,2,3-Trichloropropane	<10.0		10.0	5.90	ug/L			09/19/23 05:07	10
Vinyl acetate	<100		100	25.0	ug/L			09/19/23 05:07	10
Vinyl chloride	<10.0		10.0	1.80	ug/L			09/19/23 05:07	10
Xylenes, Total	<30.0		30.0	4.00	ug/L			09/19/23 05:07	10

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: UD-0

Date Collected: 09/13/23 10:00
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-10

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*09/19/23 05:07*	*10*
Dibromofluoromethane (Surr)	*112*		*80 - 128*		*09/19/23 05:07*	*10*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/19/23 05:07*	*10*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00225**		0.00200	0.00100	mg/L		09/19/23 09:30	10/03/23 17:08	1
Arsenic	**0.00344**		0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 20:02	1
Barium	**0.940**		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 20:02	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 20:02	1
Cadmium	**0.000305**		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 20:02	1
Chromium	**0.00768**		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 20:02	1
Cobalt	**0.0278**		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 20:02	1
Copper	**0.0186**		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 20:02	1
Lead	**0.000680**		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 20:02	1
Nickel	**0.128**		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 22:11	1
Selenium	**0.00366**	**J**	0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 20:02	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 20:02	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 20:02	1
Vanadium	**0.00306**	**J B**	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 20:02	1
Zinc	**0.00874**	**J**	0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 20:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**5.75**		1.88	0.638	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-DWT

Date Collected: 09/13/23 09:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-11

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 02:34	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 02:34	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 02:34	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 02:34	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 02:34	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 02:34	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 02:34	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 02:34	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 02:34	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 02:34	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 02:34	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 02:34	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 02:34	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 02:34	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 02:34	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 02:34	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 02:34	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 02:34	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 02:34	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 02:34	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 02:34	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 02:34	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 02:34	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 02:34	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 02:34	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 02:34	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 02:34	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 02:34	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 02:34	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 02:34	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 02:34	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 02:34	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 02:34	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 02:34	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 02:34	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 02:34	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 02:34	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 02:34	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 02:34	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 02:34	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 02:34	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 02:34	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 02:34	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 02:34	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 02:34	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 02:34	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 02:34	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-DWT

Lab Sample ID: 310-264988-11

Date Collected: 09/13/23 09:50
Matrix: Water
Date Received: 09/15/23 16:20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*09/19/23 02:34*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 128*		*09/19/23 02:34*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/19/23 02:34*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		10/05/23 09:10	10/09/23 15:02	1
Arsenic	**0.00101**	**J**	0.00200	0.000530	mg/L		10/05/23 09:10	10/09/23 14:43	1
Barium	**0.0918**		0.00200	0.000640	mg/L		10/05/23 09:10	10/09/23 14:43	1
Beryllium	**0.000364**	**J**	0.00100	0.000330	mg/L		10/05/23 09:10	10/09/23 14:43	1
Cadmium	**0.000319**		0.000200	0.000100	mg/L		10/05/23 09:10	10/09/23 14:43	1
Chromium	**0.00303**	**J**	0.00500	0.00110	mg/L		10/05/23 09:10	10/09/23 14:43	1
Cobalt	**0.000308**	**J**	0.000500	0.000170	mg/L		10/05/23 09:10	10/09/23 14:43	1
Copper	<0.00500		0.00500	0.00180	mg/L		10/05/23 09:10	10/09/23 14:43	1
Lead	**0.000721**		0.000500	0.000240	mg/L		10/05/23 09:10	10/09/23 14:43	1
Nickel	<0.00500		0.00500	0.00190	mg/L		10/05/23 09:10	10/09/23 14:43	1
Selenium	**0.0782**		0.00500	0.00140	mg/L		10/05/23 09:10	10/09/23 14:43	1
Silver	<0.00100		0.00100	0.000500	mg/L		10/05/23 09:10	10/09/23 14:43	1
Thallium	**0.00563**		0.00100	0.000260	mg/L		10/05/23 09:10	10/09/23 14:43	1
Vanadium	**0.00643**		0.00500	0.00110	mg/L		10/05/23 09:10	10/09/23 14:43	1
Zinc	<0.0200		0.0200	0.00640	mg/L		10/05/23 09:10	10/09/23 14:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88	0.638	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: Trip Blank

Lab Sample ID: 310-264988-12

Date Collected: 09/13/23 00:00
Date Received: 09/15/23 16:20

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/18/23 22:12	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/18/23 22:12	1
Benzene	<0.500		0.500	0.220	ug/L			09/18/23 22:12	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/18/23 22:12	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/18/23 22:12	1
Bromoform	<5.00		5.00	0.780	ug/L			09/18/23 22:12	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/18/23 22:12	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/18/23 22:12	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/18/23 22:12	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/18/23 22:12	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/18/23 22:12	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/18/23 22:12	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/18/23 22:12	1
Chloroform	<3.00		3.00	1.30	ug/L			09/18/23 22:12	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/18/23 22:12	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/18/23 22:12	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/18/23 22:12	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/18/23 22:12	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/18/23 22:12	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/18/23 22:12	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/18/23 22:12	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/18/23 22:12	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/18/23 22:12	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/18/23 22:12	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/18/23 22:12	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/18/23 22:12	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/18/23 22:12	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/18/23 22:12	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/18/23 22:12	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/18/23 22:12	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/18/23 22:12	1
Styrene	<1.00		1.00	0.370	ug/L			09/18/23 22:12	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/18/23 22:12	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/18/23 22:12	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/18/23 22:12	1
Toluene	<1.00		1.00	0.430	ug/L			09/18/23 22:12	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/18/23 22:12	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/18/23 22:12	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/18/23 22:12	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/18/23 22:12	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/18/23 22:12	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/18/23 22:12	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/18/23 22:12	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/18/23 22:12	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/18/23 22:12	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/18/23 22:12	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/18/23 22:12	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: Trip Blank

Lab Sample ID: 310-264988-12

Date Collected: 09/13/23 00:00
Matrix: Water
Date Received: 09/15/23 16:20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		80 - 120		09/18/23 22:12	1
Dibromofluoromethane (Surr)	104		80 - 128		09/18/23 22:12	1
Toluene-d8 (Surr)	99		80 - 120		09/18/23 22:12	1

Definitions/Glossary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Surrogate Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Method: 8260D - 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 (80-128)	TOL (80-120)
310-264988-1	MW-15R	102	112	97
310-264988-2	MW-19	108	110	99
310-264988-3	MW-20	99	108	99
310-264988-4	MW-21	102	115	102
310-264988-5	MW-24	103	109	96
310-264988-6	MW-37R	106	111	95
310-264988-7	MW-38R	107	111	98
310-264988-8	MW-39	102	108	98
310-264988-9	MW-43	100	109	98
310-264988-10	UD-0	103	112	98
310-264988-11	MW-DWT	105	106	98
310-264988-12	Trip Blank	101	104	99
LCS 310-399880/6	Lab Control Sample	100	106	100
LCS 310-399880/7	Lab Control Sample	102	108	102
MB 310-399880/5	Method Blank	101	112	99

Surrogate Legend

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

Method: 8081B - Organochlorine Pesticides (GC)

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

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	DCB1 (10-136)	TCX1 (10-130)
310-264988-2	MW-19	63	53
310-264988-3	MW-20	42	51
LCS 310-399967/4-A	Lab Control Sample	48	54
LCSD 310-399967/5-A	Lab Control Sample Dup	53	52
MB 310-399967/1-A	Method Blank	56	56

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: 8151A - Herbicides (GC)

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

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCPAA1 (25-130)
310-264988-3	MW-20	83
LCS 500-733233/2-A	Lab Control Sample	92
LCSD 500-733233/3-A	Lab Control Sample Dup	101
MB 500-733233/1-A	Method Blank	73

Surrogate Legend

DCPAA = DCAA

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 310-399880/5
Matrix: Water
Analysis Batch: 399880

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	3.10	ug/L			09/18/23 21:07	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/18/23 21:07	1
Benzene	<0.500		0.500	0.220	ug/L			09/18/23 21:07	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/18/23 21:07	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/18/23 21:07	1
Bromoform	<5.00		5.00	0.780	ug/L			09/18/23 21:07	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/18/23 21:07	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/18/23 21:07	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/18/23 21:07	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/18/23 21:07	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/18/23 21:07	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/18/23 21:07	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/18/23 21:07	1
Chloroform	<3.00		3.00	1.30	ug/L			09/18/23 21:07	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/18/23 21:07	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/18/23 21:07	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/18/23 21:07	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/18/23 21:07	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/18/23 21:07	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/18/23 21:07	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/18/23 21:07	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/18/23 21:07	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/18/23 21:07	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/18/23 21:07	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/18/23 21:07	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/18/23 21:07	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/18/23 21:07	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/18/23 21:07	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/18/23 21:07	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/18/23 21:07	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/18/23 21:07	1
Styrene	<1.00		1.00	0.370	ug/L			09/18/23 21:07	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/18/23 21:07	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/18/23 21:07	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/18/23 21:07	1
Toluene	<1.00		1.00	0.430	ug/L			09/18/23 21:07	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/18/23 21:07	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/18/23 21:07	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/18/23 21:07	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/18/23 21:07	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/18/23 21:07	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/18/23 21:07	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/18/23 21:07	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/18/23 21:07	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/18/23 21:07	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/18/23 21:07	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/18/23 21:07	1

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

Lab Sample ID: MB 310-399880/5
Matrix: Water
Analysis Batch: 399880

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

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		80 - 120		09/18/23 21:07	1
Dibromofluoromethane (Surr)	112		80 - 128		09/18/23 21:07	1
Toluene-d8 (Surr)	99		80 - 120		09/18/23 21:07	1

Lab Sample ID: LCS 310-399880/6
Matrix: Water
Analysis Batch: 399880

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	38.23		ug/L		96	50 - 150
Acrylonitrile	200	171.7		ug/L		86	50 - 150
Benzene	20.0	19.30		ug/L		97	73 - 122
Bromochloromethane	20.0	21.22		ug/L		106	68 - 132
Bromodichloromethane	20.0	19.30		ug/L		96	72 - 121
Bromoform	20.0	16.60		ug/L		83	55 - 129
2-Butanone (MEK)	40.0	35.02		ug/L		88	50 - 150
Carbon disulfide	20.0	18.67		ug/L		93	58 - 131
Carbon tetrachloride	20.0	21.24		ug/L		106	67 - 132
Chlorobenzene	20.0	19.46		ug/L		97	69 - 121
Chlorodibromomethane	20.0	19.18		ug/L		96	69 - 122
Chloroform	20.0	21.19		ug/L		106	72 - 120
cis-1,2-Dichloroethene	20.0	20.23		ug/L		101	74 - 120
cis-1,3-Dichloropropene	20.0	18.66		ug/L		93	71 - 126
1,2-Dibromo-3-chloropropane	20.0	21.25		ug/L		106	50 - 150
1,2-Dibromoethane (EDB)	20.0	20.52		ug/L		103	73 - 125
Dibromomethane	20.0	20.19		ug/L		101	72 - 123
1,2-Dichlorobenzene	20.0	19.81		ug/L		99	68 - 120
1,4-Dichlorobenzene	20.0	19.28		ug/L		96	67 - 120
1,1-Dichloroethane	20.0	19.36		ug/L		97	71 - 123
1,2-Dichloroethane	20.0	21.32		ug/L		107	70 - 124
1,1-Dichloroethene	20.0	18.57		ug/L		93	61 - 129
1,2-Dichloropropane	20.0	18.79		ug/L		94	73 - 121
Ethylbenzene	20.0	19.18		ug/L		96	69 - 122
2-Hexanone	40.0	39.09		ug/L		98	60 - 132
Iodomethane	20.0	15.91		ug/L		80	10 - 150
Methylene chloride	20.0	19.15		ug/L		96	50 - 150
4-Methyl-2-pentanone (MIBK)	40.0	37.71		ug/L		94	62 - 130
Styrene	20.0	19.53		ug/L		98	67 - 125
1,1,1,2-Tetrachloroethane	20.0	17.80		ug/L		89	68 - 123
1,1,2,2-Tetrachloroethane	20.0	18.52		ug/L		93	64 - 124
Tetrachloroethene	20.0	20.40		ug/L		102	69 - 131
Toluene	20.0	19.74		ug/L		99	72 - 121
trans-1,4-Dichloro-2-butene	20.0	18.40		ug/L		92	48 - 150
trans-1,2-Dichloroethene	20.0	19.23		ug/L		96	68 - 125
trans-1,3-Dichloropropene	20.0	18.39		ug/L		92	68 - 124
1,1,1-Trichloroethane	20.0	19.69		ug/L		98	71 - 128
1,1,2-Trichloroethane	20.0	19.23		ug/L		96	70 - 124

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

Lab Sample ID: LCS 310-399880/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399880

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichloroethene	20.0	18.99		ug/L		95	73 - 126
1,2,3-Trichloropropane	20.0	20.33		ug/L		102	64 - 125
Vinyl acetate	40.0	35.32		ug/L		88	50 - 150
Xylenes, Total	40.0	37.58		ug/L		94	68 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*106*		*80 - 128*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCS 310-399880/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399880

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bromomethane	20.0	17.63		ug/L		88	24 - 150
Chloroethane	20.0	19.67		ug/L		98	51 - 137
Chloromethane	20.0	18.06		ug/L		90	37 - 150
Trichlorofluoromethane	20.0	22.47		ug/L		112	56 - 144
Vinyl chloride	20.0	20.06		ug/L		100	57 - 136

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*
Dibromofluoromethane (Surr)	*108*		*80 - 128*
Toluene-d8 (Surr)	*102*		*80 - 120*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 310-399967/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 400513 — **Prep Batch: 399967**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane, gamma	<2.00		2.00	0.810	ug/L		09/19/23 11:10	09/25/23 12:31	1
Endosulfan I	<0.0640		0.0640	0.0330	ug/L		09/19/23 11:10	09/25/23 12:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*56*		*10 - 136*	*09/19/23 11:10*	*09/25/23 12:31*	*1*
Tetrachloro-m-xylene	*56*		*10 - 130*	*09/19/23 11:10*	*09/25/23 12:31*	*1*

Lab Sample ID: LCS 310-399967/4-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 400513 — **Prep Batch: 399967**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Endosulfan I	1.00	0.4216		ug/L		42	10 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 310-399967/4-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 400513 — **Prep Batch: 399967**

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	48		10 - 136
Tetrachloro-m-xylene	54		10 - 130

Lab Sample ID: LCSD 310-399967/5-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 400513 — **Prep Batch: 399967**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endosulfan I			1.00	0.4195		ug/L		42	10 - 120	1	35

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	53		10 - 136
Tetrachloro-m-xylene	52		10 - 130

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-733233/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 734237 — **Prep Batch: 733233**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	<1.00		1.00	0.144	ug/L		09/20/23 16:09	09/27/23 15:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	73		25 - 130	09/20/23 16:09	09/27/23 15:47	1

Lab Sample ID: LCS 500-733233/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 734237 — **Prep Batch: 733233**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2,4,5-T			2.53	2.060		ug/L		82	30 - 115		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCAA	92		25 - 130

Lab Sample ID: LCSD 500-733233/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 734237 — **Prep Batch: 733233**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4,5-T			2.53	2.329		ug/L		92	30 - 115	12	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCAA	101		25 - 130

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-399890/1-A
Matrix: Water
Analysis Batch: 401257

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 399890

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200	0.000530	mg/L		09/19/23 09:30	10/02/23 18:37	1
Barium	<0.00200		0.00200	0.000640	mg/L		09/19/23 09:30	10/02/23 18:37	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	10/02/23 18:37	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	10/02/23 18:37	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 18:37	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	10/02/23 18:37	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	10/02/23 18:37	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	10/02/23 18:37	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	10/02/23 18:37	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	10/02/23 18:37	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	10/02/23 18:37	1
Vanadium	0.001330	J	0.00500	0.00110	mg/L		09/19/23 09:30	10/02/23 18:37	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	10/02/23 18:37	1

Lab Sample ID: MB 310-399890/1-A
Matrix: Water
Analysis Batch: 401830

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 399890

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nickel	<0.00500		0.00500	0.00190	mg/L		09/19/23 09:30	10/06/23 21:12	1

Lab Sample ID: LCS 310-399890/2-A
Matrix: Water
Analysis Batch: 401257

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 399890

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.200	0.2178		mg/L		109	80 - 120
Barium	0.100	0.1092		mg/L		109	80 - 120
Beryllium	0.100	0.1008		mg/L		101	80 - 120
Cadmium	0.100	0.1125		mg/L		112	80 - 120
Chromium	0.100	0.1081		mg/L		108	80 - 120
Cobalt	0.100	0.1106		mg/L		111	80 - 120
Copper	0.200	0.2126		mg/L		106	80 - 120
Lead	0.200	0.2246		mg/L		112	80 - 120
Selenium	0.400	0.4326		mg/L		108	80 - 120
Silver	0.100	0.1060		mg/L		106	80 - 120
Thallium	0.200	0.1874		mg/L		94	80 - 120
Vanadium	0.100	0.1057		mg/L		106	80 - 120
Zinc	0.200	0.2151		mg/L		108	80 - 120

Lab Sample ID: LCS 310-399890/2-A
Matrix: Water
Analysis Batch: 401830

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 399890

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nickel	0.200	0.1966		mg/L		98	80 - 120

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

Lab Sample ID: 310-264988-2 DU — **Client Sample ID: MW-19**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401257 — **Prep Batch: 399890**

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	0.00163	J		0.001569	J	mg/L				4	20
Barium	1.24			1.254		mg/L				1	20
Beryllium	<0.00100			<0.00100		mg/L				NC	20
Cadmium	<0.000200			<0.000200		mg/L				NC	20
Chromium	<0.00500			<0.00500		mg/L				NC	20
Cobalt	0.0238			0.02373		mg/L				0.3	20
Copper	<0.00500			<0.00500		mg/L				NC	20
Lead	<0.000500			<0.000500		mg/L				NC	20
Selenium	<0.00500			<0.00500		mg/L				NC	20
Silver	<0.00100			<0.00100		mg/L				NC	20
Thallium	<0.00100			<0.00100		mg/L				NC	20
Vanadium	<0.00500			<0.00500		mg/L				NC	20
Zinc	<0.0200			<0.0200		mg/L				NC	20

Lab Sample ID: 310-264988-2 DU — **Client Sample ID: MW-19**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401411 — **Prep Batch: 399890**

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Antimony	<0.00200			<0.00200		mg/L				NC	20
Cadmium	<0.000200			<0.000200		mg/L				NC	20

Lab Sample ID: 310-264988-2 DU — **Client Sample ID: MW-19**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401830 — **Prep Batch: 399890**

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nickel	0.0431			0.04202		mg/L				3	20

Lab Sample ID: MB 310-401522/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401963 — **Prep Batch: 401522**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		10/05/23 09:10	10/09/23 14:30	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		10/05/23 09:10	10/09/23 14:30	1
Barium	<0.00200		0.00200	0.000640	mg/L		10/05/23 09:10	10/09/23 14:30	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		10/05/23 09:10	10/09/23 14:30	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		10/05/23 09:10	10/09/23 14:30	1
Chromium	<0.00500		0.00500	0.00110	mg/L		10/05/23 09:10	10/09/23 14:30	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		10/05/23 09:10	10/09/23 14:30	1
Copper	<0.00500		0.00500	0.00180	mg/L		10/05/23 09:10	10/09/23 14:30	1
Lead	<0.000500		0.000500	0.000240	mg/L		10/05/23 09:10	10/09/23 14:30	1
Nickel	<0.00500		0.00500	0.00190	mg/L		10/05/23 09:10	10/09/23 14:30	1
Selenium	<0.00500		0.00500	0.00140	mg/L		10/05/23 09:10	10/09/23 14:30	1
Silver	<0.00100		0.00100	0.000500	mg/L		10/05/23 09:10	10/09/23 14:30	1
Thallium	<0.00100		0.00100	0.000260	mg/L		10/05/23 09:10	10/09/23 14:30	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		10/05/23 09:10	10/09/23 14:30	1

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

Lab Sample ID: MB 310-401522/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401963 — **Prep Batch: 401522**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	<0.0200		0.0200	0.00640	mg/L		10/05/23 09:10	10/09/23 14:30	1

Lab Sample ID: LCS 310-401522/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401963 — **Prep Batch: 401522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.200	0.2105		mg/L		105	80 - 120
Barium	0.100	0.1065		mg/L		106	80 - 120
Beryllium	0.100	0.1041		mg/L		104	80 - 120
Cadmium	0.100	0.1048		mg/L		105	80 - 120
Chromium	0.100	0.1087		mg/L		109	80 - 120
Cobalt	0.100	0.1046		mg/L		105	80 - 120
Copper	0.200	0.2318		mg/L		116	80 - 120
Lead	0.200	0.2122		mg/L		106	80 - 120
Nickel	0.200	0.2173		mg/L		109	80 - 120
Selenium	0.400	0.4099		mg/L		102	80 - 120
Silver	0.100	0.1035		mg/L		103	80 - 120
Thallium	0.200	0.1715		mg/L		86	80 - 120
Vanadium	0.100	0.1056		mg/L		106	80 - 120
Zinc	0.200	0.2025		mg/L		101	80 - 120

Method: 9034 - Sulfide, Acid soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 500-733074/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 733075 — **Prep Batch: 733074**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	<1.00		1.00	0.231	mg/L		09/19/23 18:00	09/19/23 22:32	1

Lab Sample ID: LCS 500-733074/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 733075 — **Prep Batch: 733074**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	3.96	3.599		mg/L		91	80 - 120

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-399917/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399917

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			09/19/23 07:53	1

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: LCS 310-399917/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399917

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			100	102.0		mg/L		102	75 - 116		

Lab Sample ID: MB 310-399926/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399926

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			09/19/23 08:42	1

Lab Sample ID: LCS 310-399926/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399926

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			100	109.0		mg/L		109	75 - 116		

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

GC/MS VOA

Analysis Batch: 399880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-1	MW-15R	Total/NA	Water	8260D	
310-264988-2	MW-19	Total/NA	Water	8260D	
310-264988-3	MW-20	Total/NA	Water	8260D	
310-264988-4	MW-21	Total/NA	Water	8260D	
310-264988-5	MW-24	Total/NA	Water	8260D	
310-264988-6	MW-37R	Total/NA	Water	8260D	
310-264988-7	MW-38R	Total/NA	Water	8260D	
310-264988-8	MW-39	Total/NA	Water	8260D	
310-264988-9	MW-43	Total/NA	Water	8260D	
310-264988-10	UD-0	Total/NA	Water	8260D	
310-264988-11	MW-DWT	Total/NA	Water	8260D	
310-264988-12	Trip Blank	Total/NA	Water	8260D	
MB 310-399880/5	Method Blank	Total/NA	Water	8260D	
LCS 310-399880/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-399880/7	Lab Control Sample	Total/NA	Water	8260D	

GC Semi VOA

Prep Batch: 399967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-2	MW-19	Total/NA	Water	3510C	
310-264988-3	MW-20	Total/NA	Water	3510C	
MB 310-399967/1-A	Method Blank	Total/NA	Water	3510C	
LCS 310-399967/4-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 310-399967/5-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 400513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-2	MW-19	Total/NA	Water	8081B	399967
310-264988-3	MW-20	Total/NA	Water	8081B	399967
MB 310-399967/1-A	Method Blank	Total/NA	Water	8081B	399967
LCS 310-399967/4-A	Lab Control Sample	Total/NA	Water	8081B	399967
LCSD 310-399967/5-A	Lab Control Sample Dup	Total/NA	Water	8081B	399967

Prep Batch: 733233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-3	MW-20	Total/NA	Water	8151A	
MB 500-733233/1-A	Method Blank	Total/NA	Water	8151A	
LCS 500-733233/2-A	Lab Control Sample	Total/NA	Water	8151A	
LCSD 500-733233/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	

Analysis Batch: 734237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-3	MW-20	Total/NA	Water	8151A	733233
MB 500-733233/1-A	Method Blank	Total/NA	Water	8151A	733233
LCS 500-733233/2-A	Lab Control Sample	Total/NA	Water	8151A	733233
LCSD 500-733233/3-A	Lab Control Sample Dup	Total/NA	Water	8151A	733233

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Metals

Prep Batch: 399890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-1	MW-15R	Total/NA	Water	3005A	
310-264988-2	MW-19	Total/NA	Water	3005A	
310-264988-3	MW-20	Total/NA	Water	3005A	
310-264988-4	MW-21	Total/NA	Water	3005A	
310-264988-5	MW-24	Total/NA	Water	3005A	
310-264988-6	MW-37R	Total/NA	Water	3005A	
310-264988-7	MW-38R	Total/NA	Water	3005A	
310-264988-8	MW-39	Total/NA	Water	3005A	
310-264988-9	MW-43	Total/NA	Water	3005A	
310-264988-10	UD-0	Total/NA	Water	3005A	
MB 310-399890/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-399890/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-264988-2 DU	MW-19	Total/NA	Water	3005A	

Analysis Batch: 401257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-1	MW-15R	Total/NA	Water	6020B	399890
310-264988-2	MW-19	Total/NA	Water	6020B	399890
310-264988-3	MW-20	Total/NA	Water	6020B	399890
310-264988-4	MW-21	Total/NA	Water	6020B	399890
310-264988-5	MW-24	Total/NA	Water	6020B	399890
310-264988-6	MW-37R	Total/NA	Water	6020B	399890
310-264988-7	MW-38R	Total/NA	Water	6020B	399890
310-264988-8	MW-39	Total/NA	Water	6020B	399890
310-264988-9	MW-43	Total/NA	Water	6020B	399890
310-264988-10	UD-0	Total/NA	Water	6020B	399890
MB 310-399890/1-A	Method Blank	Total/NA	Water	6020B	399890
LCS 310-399890/2-A	Lab Control Sample	Total/NA	Water	6020B	399890
310-264988-2 DU	MW-19	Total/NA	Water	6020B	399890

Analysis Batch: 401411

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-1	MW-15R	Total/NA	Water	6020B	399890
310-264988-2	MW-19	Total/NA	Water	6020B	399890
310-264988-3	MW-20	Total/NA	Water	6020B	399890
310-264988-4	MW-21	Total/NA	Water	6020B	399890
310-264988-5	MW-24	Total/NA	Water	6020B	399890
310-264988-6	MW-37R	Total/NA	Water	6020B	399890
310-264988-7	MW-38R	Total/NA	Water	6020B	399890
310-264988-8	MW-39	Total/NA	Water	6020B	399890
310-264988-9	MW-43	Total/NA	Water	6020B	399890
310-264988-10	UD-0	Total/NA	Water	6020B	399890
310-264988-2 DU	MW-19	Total/NA	Water	6020B	399890

Prep Batch: 401522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-11	MW-DWT	Total/NA	Water	3005A	
MB 310-401522/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-401522/2-A	Lab Control Sample	Total/NA	Water	3005A	

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Metals

Analysis Batch: 401830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-1	MW-15R	Total/NA	Water	6020B	399890
310-264988-2	MW-19	Total/NA	Water	6020B	399890
310-264988-3	MW-20	Total/NA	Water	6020B	399890
310-264988-4	MW-21	Total/NA	Water	6020B	399890
310-264988-5	MW-24	Total/NA	Water	6020B	399890
310-264988-6	MW-37R	Total/NA	Water	6020B	399890
310-264988-7	MW-38R	Total/NA	Water	6020B	399890
310-264988-8	MW-39	Total/NA	Water	6020B	399890
310-264988-9	MW-43	Total/NA	Water	6020B	399890
310-264988-10	UD-0	Total/NA	Water	6020B	399890
MB 310-399890/1-A	Method Blank	Total/NA	Water	6020B	399890
LCS 310-399890/2-A	Lab Control Sample	Total/NA	Water	6020B	399890
310-264988-2 DU	MW-19	Total/NA	Water	6020B	399890

Analysis Batch: 401963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-11	MW-DWT	Total/NA	Water	6020B	401522
310-264988-11	MW-DWT	Total/NA	Water	6020B	401522
MB 310-401522/1-A	Method Blank	Total/NA	Water	6020B	401522
LCS 310-401522/2-A	Lab Control Sample	Total/NA	Water	6020B	401522

General Chemistry

Analysis Batch: 399917

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-2	MW-19	Total/NA	Water	I-3765-85	
310-264988-3	MW-20	Total/NA	Water	I-3765-85	
310-264988-5	MW-24	Total/NA	Water	I-3765-85	
310-264988-6	MW-37R	Total/NA	Water	I-3765-85	
310-264988-8	MW-39	Total/NA	Water	I-3765-85	
310-264988-9	MW-43	Total/NA	Water	I-3765-85	
310-264988-10	UD-0	Total/NA	Water	I-3765-85	
MB 310-399917/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-399917/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 399926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-1	MW-15R	Total/NA	Water	I-3765-85	
310-264988-4	MW-21	Total/NA	Water	I-3765-85	
310-264988-7	MW-38R	Total/NA	Water	I-3765-85	
310-264988-11	MW-DWT	Total/NA	Water	I-3765-85	
MB 310-399926/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-399926/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Prep Batch: 733074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-2	MW-19	Total/NA	Water	9030B	
310-264988-3	MW-20	Total/NA	Water	9030B	
310-264988-4	MW-21	Total/NA	Water	9030B	
MB 500-733074/1-A	Method Blank	Total/NA	Water	9030B	

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

General Chemistry (Continued)

Prep Batch: 733074 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 500-733074/2-A	Lab Control Sample	Total/NA	Water	9030B	

Analysis Batch: 733075

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264988-2	MW-19	Total/NA	Water	9034	733074
310-264988-3	MW-20	Total/NA	Water	9034	733074
310-264988-4	MW-21	Total/NA	Water	9034	733074
MB 500-733074/1-A	Method Blank	Total/NA	Water	9034	733074
LCS 500-733074/2-A	Lab Control Sample	Total/NA	Water	9034	733074

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-15R
Date Collected: 09/13/23 18:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/18/23 23:40
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:29
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:21
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 21:26
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Client Sample ID: MW-19
Date Collected: 09/14/23 13:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 00:02
Total/NA	Prep	3510C			399967	Y6AF	EET CF	09/19/23 11:10
Total/NA	Analysis	8081B		1	400513	BW2O	EET CF	09/25/23 16:08
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:32
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:34
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 21:29
Total/NA	Prep	9030B			733074	CLB	EET CHI	09/19/23 18:07 - 09/19/23 18:11 [1]
Total/NA	Analysis	9034		1	733075	CLB	EET CHI	09/19/23 22:44 - 09/19/23 22:50 [1]
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-20
Date Collected: 09/14/23 14:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 04:45
Total/NA	Prep	3510C			399967	Y6AF	EET CF	09/19/23 11:10
Total/NA	Analysis	8081B		1	400513	BW2O	EET CF	09/25/23 16:21
Total/NA	Prep	8151A			733233	DAK	EET CHI	09/20/23 16:09
Total/NA	Analysis	8151A		1	734237	SB	EET CHI	09/27/23 18:32
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:36
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		4	401411	A6US	EET CF	10/03/23 16:39
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 21:51

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-20
Date Collected: 09/14/23 14:02
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	9030B			733074	CLB	EET CHI	09/19/23 18:11 - 09/19/23 18:15 [1]
Total/NA	Analysis	9034		1	733075	CLB	EET CHI	09/19/23 22:50 - 09/19/23 22:56 [1]
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-21
Date Collected: 09/13/23 14:12
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 00:23
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:38
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:41
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 21:54
Total/NA	Prep	9030B			733074	CLB	EET CHI	09/19/23 18:15 - 09/19/23 18:18 [1]
Total/NA	Analysis	9034		1	733075	CLB	EET CHI	09/19/23 22:56 - 09/19/23 23:02 [1]
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Client Sample ID: MW-24
Date Collected: 09/13/23 12:24
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 00:45
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:41
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:43
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 21:57
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-37R
Date Collected: 09/13/23 13:13
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 01:07
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:53
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:45

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-37R
Lab Sample ID: 310-264988-6
Date Collected: 09/13/23 13:13
Matrix: Water
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 22:00
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-38R
Lab Sample ID: 310-264988-7
Date Collected: 09/13/23 15:39
Matrix: Water
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 01:29
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:55
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:48
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 22:03
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Client Sample ID: MW-39
Lab Sample ID: 310-264988-8
Date Collected: 09/13/23 09:50
Matrix: Water
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 01:51
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 19:57
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:50
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 22:06
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-43
Lab Sample ID: 310-264988-9
Date Collected: 09/13/23 16:50
Matrix: Water
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 02:12
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 20:00
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 16:52
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 22:08

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Client Sample ID: MW-43
Date Collected: 09/13/23 16:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: UD-0
Date Collected: 09/13/23 10:00
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		10	399880	WSE8	EET CF	09/19/23 05:07
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401257	A6US	EET CF	10/02/23 20:02
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401411	A6US	EET CF	10/03/23 17:08
Total/NA	Prep	3005A			399890	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401830	A6US	EET CF	10/06/23 22:11
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-DWT
Date Collected: 09/13/23 09:50
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 02:34
Total/NA	Prep	3005A			401522	KCK5	EET CF	10/05/23 09:10
Total/NA	Analysis	6020B		1	401963	A6US	EET CF	10/09/23 14:43
Total/NA	Prep	3005A			401522	KCK5	EET CF	10/05/23 09:10
Total/NA	Analysis	6020B		1	401963	A6US	EET CF	10/09/23 15:02
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Client Sample ID: Trip Blank
Date Collected: 09/13/23 00:00
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264988-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/18/23 22:12

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

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

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

Laboratory: Eurofins Chicago

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	082	05-01-24

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

Analysis Method	Prep Method	Matrix	Analyte
8151A	8151A	Water	2,4,5-T

Method Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 WT HMSP

Job ID: 310-264988-1
SDG: 27223236.24

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
8081B	Organochlorine Pesticides (GC)	SW846	EET CF
8151A	Herbicides (GC)	SW846	EET CHI
6020B	Metals (ICP/MS)	SW846	EET CF
9034	Sulfide, Acid soluble and Insoluble (Titrimetric)	SW846	EET CHI
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF
8151A	Extraction (Herbicides)	SW846	EET CHI
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	SW846	EET CHI

Protocol References:

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:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

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310-264988 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: SCS			
City/State:	CITY	STATE	Project:
Receipt Information			
Date/Time Received:	DATE 9/15/23	TIME 1620	Received By: EM

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~~ 3 EM
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-21, MW-11, MW-23, MW-DUT
MW 36

Temperature Record					
Coolant:	☒ Wet ice	☐ Blue ice	☐ Dry ice	☐ Other:_____	☐ NONE
Thermometer ID: R			Correction Factor (°C): 0		

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 19	Corrected Temp (°C): 19

• **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

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/15/23 TIME 1620 | Received By: EM

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 ~~2~~ 3 EM

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 19, MW DDS, MW-22, MW-20

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.5 | Corrected Temp (°C): 2.5

• **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

Document CED-P-SAM-FRM45521
Revision. 26
Date 27 Jan 2022

Eurofins Cedar Falls

General temperature criteria is 0 to 6°C
Bacteria temperature criteria is 0 to 10°C

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/15/23 | TIME 1620 | Received By: EM

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? ↓

[illegible] EM

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R | Correction Factor (°C): 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

TestAmerica

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER: SCS Engineers
SITE NAME: Cass County Sanitary Landfill
ADDRESS:
CITY/STATE/ZIP:
TELEPHONE NUMBER: Fax:
SAMPLED BY (PRINT NAME): Caleb Gomez
SIGNATURE: Caleb Gomez

REPORT TO
NAME: Ben Madson
COMPANY NAME: SCS Engineers
PROJECT NAME: Cass County Sanitary Landfill (Fall 2023 WT HMSP)
PROJECT NUMBER: 27223236.24
ADDRESS: 1690 All State Ct, Ste 100
CITY/STATE/ZIP: West Des Moines, IA 50265

								Preservative								Matrix						Analyze For										
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	Ice	HNO (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO Plastic (Yellow & White Label)	H_2SO Glass (Yellow & White Label)	None (Black & White Label)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Appendix I	Endosulfan I	Endosulfan Sulfate	Gamma-Chlordane	Sulfide	2,4,5-T (2C)	Total Suspended Solids	Trip Blank			Fax Results
MW 15R		9/13	18:50		X			X								X						X						X				
MW-12					X			X								X						X						X				
MW 19		9/14	13:02		X			X								X						X			X	X		X				
MW-20		9/14	14:02		X			X								X						X	X			X	X	X				
MW-21		9/13	14:12		X			X								X						X				X		X				
MW 24		9/13	12:24		X			X								X						X						X				
MW-37R		9/13	13:13		X			X								X						X						X				
MW-38R		9/13	15:39		X			X								X						X						X				
MW 39		9/13	9:50		X			X								X						X						X				
MW-43		9/13	16:50		X			X								X						X						X				
UD-0		9/13	10:00		X			X								X						X						X				
UD-1					X			X								X						X						X				
MW-DWT		9/13	9:50		X			X								X						X						X				
Trip Blank															X						X								X			

Relinquished by	Date	Time	Received by	Date	Time	Relinquished by	Time
Caleb Gomez	9/15/23	14:30					

Shipped Via			Comments	Shipped Via
Received for Lab by: SL	Date: 9/15/23	Time: 1620	Temperature Upon Receipt	

Laboratory Comment: (1) For Appendix I and analysis report to the reporting limit not the detection limit. Make sure that the reporting limits are below the EPA's MCLs.
(2) For analysis other than Appendix I and report to the detection limit please make sure that the detection limit are below the EPA's MCLs.
(3) In the "Result" column for LDD results, when non-detect please report the reporting limits or the detection limit instead of indicating with "ND".

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319-277 2401 Fax 319-277-2425

Chain of Custody Record

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310-264988 COC

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Liechti Meredith L	COC No: 310-65400 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: meredith liechti@et eurofinsus com	State of Orig: Iowa	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State Program - Iowa	Job #: 310-264988-1
Address: 2417 Bond Street	Due Date Requested: 9/28/2023		
City: University Park	TAT Requested (days):		
State Zip: IL 60484			
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	PO #:		
Email:	WO #:		
Project Name: Cass County Sanitary Landfill (Fall 2023 WT HMSP	Project #: 31002404		
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, Y Trizma, 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)	9034_Calc/9030B	8151A/8151A_AP (MOD) Default List	Total Number of containers	Special Instructions/Note
			Preservation Code							
MW-19 (310-264988-2)	9/14/23	13 02 Central		Water			X		1	
MW-20 (310-264988-3)	9/14/23	14 02 Central		Water			X	X	1	
MW 21 (310-264988-4)	9/13/23	14 12 Central		Water			X		1	

Note Since laboratory accreditations are subject to change Eurofins Environment Testing North Central LLC places the ownership of method analyte & accreditation compliance upon our 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 Eurofins Environment Testing North Central LLC laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Environment Testing North Central LLC attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central LLC

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	Company	Received by	Date/Time	Company
[signature]	9/8/23 1300		Stephanie Hernandez	9/19/23 0920	~~ETIA~~
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

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

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-264988-1
SDG Number: 27223236.24

Login Number: 264988
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins 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: 310-264988-1
SDG Number: 27223236.24

Login Number: 264988
List Number: 2
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago
List Creation: 09/19/23 10:49 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.5
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").	N/A	
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

PREPARED FOR

Attn: Ben Madson
SCS Engineers
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

Generated 10/11/2023 2:45:18 PM

JOB DESCRIPTION

Cass County Sanitary Landfill (Fall 2023 HMSP DS)
SDG NUMBER 27223236.24

JOB NUMBER

310-264989-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

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The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Job ID: 310-264989-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-264989-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 9/15/2023 4:20 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9°C, 1.9°C and 2.5°C

GC/MS VOA
Method 8260D: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container: Trip Blank (310-264989-6).

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

Metals
Method 6020B: The low level check standard recovery associated with batch 310-401213 is outside the acceptance criteria for the following analyte(s): Antimony.

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

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

Sample Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-264989-1	MW-22	Water	09/14/23 10:13	09/15/23 16:20
310-264989-2	MW-11	Water	09/13/23 17:57	09/15/23 16:20
310-264989-3	MW-23	Water	09/13/23 14:51	09/15/23 16:20
310-264989-4	MW-36	Water	09/13/23 10:59	09/15/23 16:20
310-264989-5	MW-DDS	Water	09/14/23 10:13	09/15/23 16:20
310-264989-6	Trip Blank	Water	09/14/23 00:00	09/15/23 16:20

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-22 — Lab Sample ID: 310-264989-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.000921	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.232		0.00200	0.000640	mg/L	1		6020B	Total/NA
Selenium	0.00149	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Vanadium	0.00119	J	0.00500	0.00110	mg/L	1		6020B	Total/NA

Client Sample ID: MW-11 — Lab Sample ID: 310-264989-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.299	J	1.00	0.210	ug/L	1		8260D	Total/NA
Arsenic	0.0145		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.636		0.00200	0.000640	mg/L	1		6020B	Total/NA
Cadmium	0.000213		0.000200	0.000100	mg/L	1		6020B	Total/NA
Cobalt	0.0113		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.00181	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.000589		0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.0142		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00170	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Silver	0.00111		0.00100	0.000500	mg/L	1		6020B	Total/NA
Thallium	0.00789		0.00100	0.000260	mg/L	1		6020B	Total/NA
Total Suspended Solids	8.25		1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-23 — Lab Sample ID: 310-264989-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.000618	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.146		0.00200	0.000640	mg/L	1		6020B	Total/NA
Selenium	0.00219	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Thallium	0.00150		0.00100	0.000260	mg/L	1		6020B	Total/NA
Total Suspended Solids	1.13	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-36 — Lab Sample ID: 310-264989-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00133	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.135		0.00200	0.000640	mg/L	1		6020B	Total/NA
Beryllium	0.000906	J	0.00100	0.000330	mg/L	1		6020B	Total/NA
Cadmium	0.000656		0.000200	0.000100	mg/L	1		6020B	Total/NA
Chromium	0.00257	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.00387		0.000500	0.000170	mg/L	1		6020B	Total/NA
Copper	0.00388	J	0.00500	0.00180	mg/L	1		6020B	Total/NA
Lead	0.00215		0.000500	0.000240	mg/L	1		6020B	Total/NA
Nickel	0.0183		0.00500	0.00190	mg/L	1		6020B	Total/NA
Selenium	0.00199	J	0.00500	0.00140	mg/L	1		6020B	Total/NA
Vanadium	0.0101		0.00500	0.00110	mg/L	1		6020B	Total/NA
Zinc	0.0151	J	0.0200	0.00640	mg/L	1		6020B	Total/NA
Total Suspended Solids	468		60.0	20.4	mg/L	1		I-3765-85	Total/NA

Client Sample ID: MW-DDS — Lab Sample ID: 310-264989-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.000554	J	0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.244		0.00200	0.000640	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-DDS (Continued) — Lab Sample ID: 310-264989-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nickel	0.0165		0.00500	0.00190	mg/L	1		6020B	Total/NA
Vanadium	0.00152	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Total Suspended Solids	1.13	J	1.88	0.638	mg/L	1		I-3765-85	Total/NA

Client Sample ID: Trip Blank — Lab Sample ID: 310-264989-6

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-22

Lab Sample ID: 310-264989-1

Date Collected: 09/14/23 10:13
Matrix: Water
Date Received: 09/15/23 16:20

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 02:56	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 02:56	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 02:56	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 02:56	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 02:56	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 02:56	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 02:56	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 02:56	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 02:56	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 02:56	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 02:56	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 02:56	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 02:56	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 02:56	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 02:56	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 02:56	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 02:56	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 02:56	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 02:56	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 02:56	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 02:56	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 02:56	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 02:56	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 02:56	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 02:56	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 02:56	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 02:56	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 02:56	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 02:56	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 02:56	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 02:56	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 02:56	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 02:56	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 02:56	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 02:56	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 02:56	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 02:56	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 02:56	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 02:56	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 02:56	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 02:56	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 02:56	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 02:56	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 02:56	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 02:56	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 02:56	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 02:56	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-22

Date Collected: 09/14/23 10:13
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264989-1

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*09/19/23 02:56*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 128*		*09/19/23 02:56*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*09/19/23 02:56*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	09/29/23 06:54	1
Arsenic	**0.000921**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	09/29/23 06:54	1
Barium	**0.232**		0.00200	0.000640	mg/L		09/19/23 09:30	09/29/23 06:54	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	09/29/23 06:54	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	09/29/23 06:54	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 06:54	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	09/29/23 06:54	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	09/29/23 06:54	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	09/29/23 06:54	1
Nickel	<0.00500		0.00500	0.00190	mg/L		09/19/23 09:30	09/29/23 06:54	1
Selenium	**0.00149**	**J**	0.00500	0.00140	mg/L		09/19/23 09:30	09/29/23 06:54	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	09/29/23 06:54	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	09/29/23 06:54	1
Vanadium	**0.00119**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 06:54	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	09/29/23 06:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88	0.638	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-11

Date Collected: 09/13/23 17:57
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264989-2

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 03:18	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 03:18	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 03:18	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 03:18	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 03:18	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 03:18	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 03:18	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 03:18	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 03:18	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 03:18	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 03:18	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 03:18	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 03:18	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 03:18	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 03:18	1
cis-1,2-Dichloroethene	**0.299**	**J**	1.00	0.210	ug/L			09/19/23 03:18	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 03:18	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 03:18	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 03:18	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 03:18	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 03:18	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 03:18	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 03:18	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 03:18	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 03:18	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 03:18	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 03:18	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 03:18	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 03:18	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 03:18	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 03:18	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 03:18	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 03:18	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 03:18	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 03:18	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 03:18	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 03:18	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 03:18	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 03:18	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 03:18	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 03:18	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 03:18	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 03:18	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 03:18	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 03:18	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 03:18	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 03:18	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-11

Date Collected: 09/13/23 17:57
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264989-2

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*09/19/23 03:18*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 128*		*09/19/23 03:18*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/19/23 03:18*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	09/30/23 18:05	1
Arsenic	**0.0145**		0.00200	0.000530	mg/L		09/19/23 09:30	09/29/23 15:12	1
Barium	**0.636**		0.00200	0.000640	mg/L		09/19/23 09:30	09/29/23 15:12	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	09/29/23 15:12	1
Cadmium	**0.000213**		0.000200	0.000100	mg/L		09/19/23 09:30	09/29/23 15:12	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 15:12	1
Cobalt	**0.0113**		0.000500	0.000170	mg/L		09/19/23 09:30	09/29/23 15:12	1
Copper	**0.00181**	**J**	0.00500	0.00180	mg/L		09/19/23 09:30	09/29/23 15:12	1
Lead	**0.000589**		0.000500	0.000240	mg/L		09/19/23 09:30	09/29/23 15:12	1
Nickel	**0.0142**		0.00500	0.00190	mg/L		09/19/23 09:30	09/29/23 15:12	1
Selenium	**0.00170**	**J**	0.00500	0.00140	mg/L		09/19/23 09:30	09/29/23 15:12	1
Silver	**0.00111**		0.00100	0.000500	mg/L		09/19/23 09:30	09/29/23 15:12	1
Thallium	**0.00789**		0.00100	0.000260	mg/L		09/19/23 09:30	09/30/23 18:05	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 15:12	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	09/30/23 18:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**8.25**		1.88	0.638	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-23

Lab Sample ID: 310-264989-3

Date Collected: 09/13/23 14:51
Date Received: 09/15/23 16:20

Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 03:40	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 03:40	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 03:40	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 03:40	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 03:40	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 03:40	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 03:40	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 03:40	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 03:40	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 03:40	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 03:40	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 03:40	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 03:40	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 03:40	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 03:40	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 03:40	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 03:40	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 03:40	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 03:40	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 03:40	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 03:40	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 03:40	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 03:40	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 03:40	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 03:40	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 03:40	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 03:40	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 03:40	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 03:40	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 03:40	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 03:40	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 03:40	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 03:40	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 03:40	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 03:40	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 03:40	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 03:40	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 03:40	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 03:40	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 03:40	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 03:40	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 03:40	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 03:40	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 03:40	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 03:40	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 03:40	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 03:40	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-23

Date Collected: 09/13/23 14:51
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264989-3

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*09/19/23 03:40*	*1*
Dibromofluoromethane (Surr)	*112*		*80 - 128*		*09/19/23 03:40*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*09/19/23 03:40*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	09/30/23 18:08	1
Arsenic	**0.000618**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	09/29/23 15:16	1
Barium	**0.146**		0.00200	0.000640	mg/L		09/19/23 09:30	09/29/23 15:16	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	09/29/23 15:16	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	09/29/23 15:16	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 15:16	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	09/29/23 15:16	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	09/29/23 15:16	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	09/29/23 15:16	1
Nickel	<0.00500		0.00500	0.00190	mg/L		09/19/23 09:30	09/29/23 15:16	1
Selenium	**0.00219**	**J**	0.00500	0.00140	mg/L		09/19/23 09:30	09/29/23 15:16	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	09/29/23 15:16	1
Thallium	**0.00150**		0.00100	0.000260	mg/L		09/19/23 09:30	09/30/23 18:08	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 15:16	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	09/30/23 18:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**1.13**	**J**	1.88	0.638	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-36

Lab Sample ID: 310-264989-4

Date Collected: 09/13/23 10:59
Matrix: Water
Date Received: 09/15/23 16:20

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 04:02	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 04:02	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 04:02	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 04:02	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 04:02	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 04:02	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 04:02	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 04:02	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 04:02	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 04:02	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 04:02	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 04:02	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 04:02	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 04:02	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 04:02	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 04:02	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 04:02	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 04:02	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 04:02	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 04:02	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 04:02	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 04:02	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 04:02	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 04:02	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 04:02	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 04:02	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 04:02	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 04:02	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 04:02	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 04:02	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 04:02	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 04:02	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 04:02	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 04:02	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 04:02	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 04:02	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 04:02	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 04:02	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 04:02	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 04:02	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 04:02	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 04:02	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 04:02	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 04:02	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 04:02	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 04:02	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 04:02	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-36

Date Collected: 09/13/23 10:59
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264989-4

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*09/19/23 04:02*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 128*		*09/19/23 04:02*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*09/19/23 04:02*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	09/30/23 18:10	1
Arsenic	**0.00133**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	09/29/23 15:19	1
Barium	**0.135**		0.00200	0.000640	mg/L		09/19/23 09:30	09/29/23 15:19	1
Beryllium	**0.000906**	**J**	0.00100	0.000330	mg/L		09/19/23 09:30	09/29/23 15:19	1
Cadmium	**0.000656**		0.000200	0.000100	mg/L		09/19/23 09:30	09/29/23 15:19	1
Chromium	**0.00257**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 15:19	1
Cobalt	**0.00387**		0.000500	0.000170	mg/L		09/19/23 09:30	09/29/23 15:19	1
Copper	**0.00388**	**J**	0.00500	0.00180	mg/L		09/19/23 09:30	09/29/23 15:19	1
Lead	**0.00215**		0.000500	0.000240	mg/L		09/19/23 09:30	09/29/23 15:19	1
Nickel	**0.0183**		0.00500	0.00190	mg/L		09/19/23 09:30	09/29/23 15:19	1
Selenium	**0.00199**	**J**	0.00500	0.00140	mg/L		09/19/23 09:30	09/29/23 15:19	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	09/29/23 15:19	1
Thallium	<0.00100	^3+	0.00100	0.000260	mg/L		09/19/23 09:30	09/29/23 15:19	1
Vanadium	**0.0101**		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 15:19	1
Zinc	**0.0151**	**J**	0.0200	0.00640	mg/L		09/19/23 09:30	09/30/23 18:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**468**		60.0	20.4	mg/L			09/19/23 08:42	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-DDS

Lab Sample ID: 310-264989-5

Date Collected: 09/14/23 10:13
Matrix: Water
Date Received: 09/15/23 16:20

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/19/23 04:24	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/19/23 04:24	1
Benzene	<0.500		0.500	0.220	ug/L			09/19/23 04:24	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/19/23 04:24	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/19/23 04:24	1
Bromoform	<5.00		5.00	0.780	ug/L			09/19/23 04:24	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/19/23 04:24	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/19/23 04:24	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/19/23 04:24	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/19/23 04:24	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/19/23 04:24	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/19/23 04:24	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/19/23 04:24	1
Chloroform	<3.00		3.00	1.30	ug/L			09/19/23 04:24	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/19/23 04:24	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/19/23 04:24	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/19/23 04:24	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/19/23 04:24	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/19/23 04:24	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/19/23 04:24	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/19/23 04:24	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/19/23 04:24	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/19/23 04:24	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/19/23 04:24	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/19/23 04:24	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/19/23 04:24	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/19/23 04:24	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/19/23 04:24	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/19/23 04:24	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/19/23 04:24	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/19/23 04:24	1
Styrene	<1.00		1.00	0.370	ug/L			09/19/23 04:24	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/19/23 04:24	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/19/23 04:24	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/19/23 04:24	1
Toluene	<1.00		1.00	0.430	ug/L			09/19/23 04:24	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/19/23 04:24	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/19/23 04:24	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/19/23 04:24	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/19/23 04:24	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/19/23 04:24	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/19/23 04:24	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/19/23 04:24	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/19/23 04:24	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/19/23 04:24	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/19/23 04:24	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/19/23 04:24	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-DDS

Date Collected: 09/14/23 10:13
Date Received: 09/15/23 16:20

Lab Sample ID: 310-264989-5

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*09/19/23 04:24*	*1*
Dibromofluoromethane (Surr)	*107*		*80 - 128*		*09/19/23 04:24*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*09/19/23 04:24*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	09/30/23 18:12	1
Arsenic	**0.000554**	**J**	0.00200	0.000530	mg/L		09/19/23 09:30	09/30/23 18:12	1
Barium	**0.244**		0.00200	0.000640	mg/L		09/19/23 09:30	09/30/23 18:12	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	09/30/23 18:12	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	09/30/23 18:12	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/30/23 18:12	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	09/30/23 18:12	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	09/30/23 18:12	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	09/30/23 18:12	1
Nickel	**0.0165**		0.00500	0.00190	mg/L		09/19/23 09:30	10/11/23 13:01	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	09/30/23 18:12	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	09/30/23 18:12	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	09/30/23 18:12	1
Vanadium	**0.00152**	**J**	0.00500	0.00110	mg/L		09/19/23 09:30	09/30/23 18:12	1
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	09/30/23 18:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**1.13**	**J**	1.88	0.638	mg/L			09/19/23 07:53	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: Trip Blank

Lab Sample ID: 310-264989-6

Date Collected: 09/14/23 00:00
Matrix: Water
Date Received: 09/15/23 16:20

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	<10.0		10.0	3.10	ug/L			09/18/23 22:34	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/18/23 22:34	1
Benzene	<0.500		0.500	0.220	ug/L			09/18/23 22:34	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/18/23 22:34	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/18/23 22:34	1
Bromoform	<5.00		5.00	0.780	ug/L			09/18/23 22:34	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/18/23 22:34	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/18/23 22:34	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/18/23 22:34	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/18/23 22:34	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/18/23 22:34	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/18/23 22:34	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/18/23 22:34	1
Chloroform	<3.00		3.00	1.30	ug/L			09/18/23 22:34	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/18/23 22:34	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/18/23 22:34	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/18/23 22:34	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/18/23 22:34	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/18/23 22:34	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/18/23 22:34	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/18/23 22:34	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/18/23 22:34	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/18/23 22:34	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/18/23 22:34	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/18/23 22:34	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/18/23 22:34	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/18/23 22:34	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/18/23 22:34	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/18/23 22:34	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/18/23 22:34	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/18/23 22:34	1
Styrene	<1.00		1.00	0.370	ug/L			09/18/23 22:34	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/18/23 22:34	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/18/23 22:34	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/18/23 22:34	1
Toluene	<1.00		1.00	0.430	ug/L			09/18/23 22:34	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/18/23 22:34	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/18/23 22:34	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/18/23 22:34	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/18/23 22:34	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/18/23 22:34	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/18/23 22:34	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/18/23 22:34	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/18/23 22:34	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/18/23 22:34	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/18/23 22:34	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/18/23 22:34	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: Trip Blank

Lab Sample ID: 310-264989-6

Date Collected: 09/14/23 00:00
Matrix: Water
Date Received: 09/15/23 16:20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	103		80 - 120		09/18/23 22:34	1
Dibromofluoromethane (Surr)	107		80 - 128		09/18/23 22:34	1
Toluene-d8 (Surr)	97		80 - 120		09/18/23 22:34	1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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
^3+	Reporting Limit Check Standard is outside acceptance limits, high biased
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Surrogate Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Method: 8260D - 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)	(80-128)	(80-120)
310-264989-1	MW-22	104	105	97
310-264989-2	MW-11	105	112	99
310-264989-3	MW-23	105	112	96
310-264989-4	MW-36	107	106	99
310-264989-5	MW-DDS	105	107	98
310-264989-6	Trip Blank	103	107	97
LCS 310-399880/6	Lab Control Sample	100	106	100
LCS 310-399880/7	Lab Control Sample	102	108	102
MB 310-399880/5	Method Blank	101	112	99

Surrogate Legend

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

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 310-399880/5
Matrix: Water
Analysis Batch: 399880

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	3.10	ug/L			09/18/23 21:07	1
Acrylonitrile	<5.00		5.00	2.20	ug/L			09/18/23 21:07	1
Benzene	<0.500		0.500	0.220	ug/L			09/18/23 21:07	1
Bromochloromethane	<5.00		5.00	0.540	ug/L			09/18/23 21:07	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			09/18/23 21:07	1
Bromoform	<5.00		5.00	0.780	ug/L			09/18/23 21:07	1
Bromomethane	<4.00		4.00	1.10	ug/L			09/18/23 21:07	1
2-Butanone (MEK)	<10.0		10.0	2.10	ug/L			09/18/23 21:07	1
Carbon disulfide	<1.00		1.00	0.450	ug/L			09/18/23 21:07	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			09/18/23 21:07	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			09/18/23 21:07	1
Chlorodibromomethane	<5.00		5.00	0.750	ug/L			09/18/23 21:07	1
Chloroethane	<4.00		4.00	0.790	ug/L			09/18/23 21:07	1
Chloroform	<3.00		3.00	1.30	ug/L			09/18/23 21:07	1
Chloromethane	<3.00		3.00	0.610	ug/L			09/18/23 21:07	1
cis-1,2-Dichloroethene	<1.00		1.00	0.210	ug/L			09/18/23 21:07	1
cis-1,3-Dichloropropene	<5.00		5.00	0.250	ug/L			09/18/23 21:07	1
1,2-Dibromo-3-chloropropane	<5.00		5.00	1.20	ug/L			09/18/23 21:07	1
1,2-Dibromoethane (EDB)	<1.00		1.00	0.340	ug/L			09/18/23 21:07	1
Dibromomethane	<1.00		1.00	0.330	ug/L			09/18/23 21:07	1
1,2-Dichlorobenzene	<1.00		1.00	0.370	ug/L			09/18/23 21:07	1
1,4-Dichlorobenzene	<1.00		1.00	0.230	ug/L			09/18/23 21:07	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			09/18/23 21:07	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			09/18/23 21:07	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			09/18/23 21:07	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			09/18/23 21:07	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			09/18/23 21:07	1
2-Hexanone	<10.0		10.0	2.00	ug/L			09/18/23 21:07	1
Iodomethane	<10.0		10.0	7.00	ug/L			09/18/23 21:07	1
Methylene chloride	<5.00		5.00	1.70	ug/L			09/18/23 21:07	1
4-Methyl-2-pentanone (MIBK)	<10.0		10.0	2.10	ug/L			09/18/23 21:07	1
Styrene	<1.00		1.00	0.370	ug/L			09/18/23 21:07	1
1,1,1,2-Tetrachloroethane	<1.00		1.00	0.380	ug/L			09/18/23 21:07	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			09/18/23 21:07	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			09/18/23 21:07	1
Toluene	<1.00		1.00	0.430	ug/L			09/18/23 21:07	1
trans-1,4-Dichloro-2-butene	<10.0		10.0	1.10	ug/L			09/18/23 21:07	1
trans-1,2-Dichloroethene	<1.00		1.00	0.270	ug/L			09/18/23 21:07	1
trans-1,3-Dichloropropene	<5.00		5.00	0.560	ug/L			09/18/23 21:07	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			09/18/23 21:07	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			09/18/23 21:07	1
Trichloroethene	<1.00		1.00	0.430	ug/L			09/18/23 21:07	1
Trichlorofluoromethane	<4.00		4.00	0.380	ug/L			09/18/23 21:07	1
1,2,3-Trichloropropane	<1.00		1.00	0.590	ug/L			09/18/23 21:07	1
Vinyl acetate	<10.0		10.0	2.50	ug/L			09/18/23 21:07	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			09/18/23 21:07	1
Xylenes, Total	<3.00		3.00	0.400	ug/L			09/18/23 21:07	1

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

Lab Sample ID: MB 310-399880/5
Matrix: Water
Analysis Batch: 399880

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

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		80 - 120		09/18/23 21:07	1
Dibromofluoromethane (Surr)	112		80 - 128		09/18/23 21:07	1
Toluene-d8 (Surr)	99		80 - 120		09/18/23 21:07	1

Lab Sample ID: LCS 310-399880/6
Matrix: Water
Analysis Batch: 399880

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	38.23		ug/L		96	50 - 150
Acrylonitrile	200	171.7		ug/L		86	50 - 150
Benzene	20.0	19.30		ug/L		97	73 - 122
Bromochloromethane	20.0	21.22		ug/L		106	68 - 132
Bromodichloromethane	20.0	19.30		ug/L		96	72 - 121
Bromoform	20.0	16.60		ug/L		83	55 - 129
2-Butanone (MEK)	40.0	35.02		ug/L		88	50 - 150
Carbon disulfide	20.0	18.67		ug/L		93	58 - 131
Carbon tetrachloride	20.0	21.24		ug/L		106	67 - 132
Chlorobenzene	20.0	19.46		ug/L		97	69 - 121
Chlorodibromomethane	20.0	19.18		ug/L		96	69 - 122
Chloroform	20.0	21.19		ug/L		106	72 - 120
cis-1,2-Dichloroethene	20.0	20.23		ug/L		101	74 - 120
cis-1,3-Dichloropropene	20.0	18.66		ug/L		93	71 - 126
1,2-Dibromo-3-chloropropane	20.0	21.25		ug/L		106	50 - 150
1,2-Dibromoethane (EDB)	20.0	20.52		ug/L		103	73 - 125
Dibromomethane	20.0	20.19		ug/L		101	72 - 123
1,2-Dichlorobenzene	20.0	19.81		ug/L		99	68 - 120
1,4-Dichlorobenzene	20.0	19.28		ug/L		96	67 - 120
1,1-Dichloroethane	20.0	19.36		ug/L		97	71 - 123
1,2-Dichloroethane	20.0	21.32		ug/L		107	70 - 124
1,1-Dichloroethene	20.0	18.57		ug/L		93	61 - 129
1,2-Dichloropropane	20.0	18.79		ug/L		94	73 - 121
Ethylbenzene	20.0	19.18		ug/L		96	69 - 122
2-Hexanone	40.0	39.09		ug/L		98	60 - 132
Iodomethane	20.0	15.91		ug/L		80	10 - 150
Methylene chloride	20.0	19.15		ug/L		96	50 - 150
4-Methyl-2-pentanone (MIBK)	40.0	37.71		ug/L		94	62 - 130
Styrene	20.0	19.53		ug/L		98	67 - 125
1,1,1,2-Tetrachloroethane	20.0	17.80		ug/L		89	68 - 123
1,1,2,2-Tetrachloroethane	20.0	18.52		ug/L		93	64 - 124
Tetrachloroethene	20.0	20.40		ug/L		102	69 - 131
Toluene	20.0	19.74		ug/L		99	72 - 121
trans-1,4-Dichloro-2-butene	20.0	18.40		ug/L		92	48 - 150
trans-1,2-Dichloroethene	20.0	19.23		ug/L		96	68 - 125
trans-1,3-Dichloropropene	20.0	18.39		ug/L		92	68 - 124
1,1,1-Trichloroethane	20.0	19.69		ug/L		98	71 - 128
1,1,2-Trichloroethane	20.0	19.23		ug/L		96	70 - 124

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

Lab Sample ID: LCS 310-399880/6
Matrix: Water
Analysis Batch: 399880

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichloroethene	20.0	18.99		ug/L		95	73 - 126
1,2,3-Trichloropropane	20.0	20.33		ug/L		102	64 - 125
Vinyl acetate	40.0	35.32		ug/L		88	50 - 150
Xylenes, Total	40.0	37.58		ug/L		94	68 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*106*		*80 - 128*
Toluene-d8 (Surr)	*100*		*80 - 120*

Lab Sample ID: LCS 310-399880/7
Matrix: Water
Analysis Batch: 399880

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	17.63		ug/L		88	24 - 150
Chloroethane	20.0	19.67		ug/L		98	51 - 137
Chloromethane	20.0	18.06		ug/L		90	37 - 150
Trichlorofluoromethane	20.0	22.47		ug/L		112	56 - 144
Vinyl chloride	20.0	20.06		ug/L		100	57 - 136

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*
Dibromofluoromethane (Surr)	*108*		*80 - 128*
Toluene-d8 (Surr)	*102*		*80 - 120*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-399889/1-A
Matrix: Water
Analysis Batch: 401021

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 399889

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		09/19/23 09:30	09/29/23 05:01	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		09/19/23 09:30	09/29/23 05:01	1
Barium	<0.00200		0.00200	0.000640	mg/L		09/19/23 09:30	09/29/23 05:01	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		09/19/23 09:30	09/29/23 05:01	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		09/19/23 09:30	09/29/23 05:01	1
Chromium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 05:01	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		09/19/23 09:30	09/29/23 05:01	1
Copper	<0.00500		0.00500	0.00180	mg/L		09/19/23 09:30	09/29/23 05:01	1
Lead	<0.000500		0.000500	0.000240	mg/L		09/19/23 09:30	09/29/23 05:01	1
Nickel	<0.00500		0.00500	0.00190	mg/L		09/19/23 09:30	09/29/23 05:01	1
Selenium	<0.00500		0.00500	0.00140	mg/L		09/19/23 09:30	09/29/23 05:01	1
Silver	<0.00100		0.00100	0.000500	mg/L		09/19/23 09:30	09/29/23 05:01	1
Thallium	<0.00100		0.00100	0.000260	mg/L		09/19/23 09:30	09/29/23 05:01	1
Vanadium	<0.00500		0.00500	0.00110	mg/L		09/19/23 09:30	09/29/23 05:01	1

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

Lab Sample ID: MB 310-399889/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401021 — **Prep Batch: 399889**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	<0.0200		0.0200	0.00640	mg/L		09/19/23 09:30	09/29/23 05:01	1

Lab Sample ID: LCS 310-399889/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401021 — **Prep Batch: 399889**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2174		mg/L		109	80 - 120
Arsenic	0.200	0.2065		mg/L		103	80 - 120
Barium	0.100	0.09190		mg/L		92	80 - 120
Beryllium	0.100	0.09576		mg/L		96	80 - 120
Cadmium	0.100	0.09054		mg/L		91	80 - 120
Chromium	0.100	0.09458		mg/L		95	80 - 120
Cobalt	0.100	0.09691		mg/L		97	80 - 120
Copper	0.200	0.1863		mg/L		93	80 - 120
Lead	0.200	0.1913		mg/L		96	80 - 120
Nickel	0.200	0.1853		mg/L		93	80 - 120
Selenium	0.400	0.3628		mg/L		91	80 - 120
Silver	0.100	0.08560		mg/L		86	80 - 120
Vanadium	0.100	0.08941		mg/L		89	80 - 120
Zinc	0.200	0.1755		mg/L		88	80 - 120

Lab Sample ID: LCS 310-399889/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401128 — **Prep Batch: 399889**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	0.200	0.2103		mg/L		105	80 - 120

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-399917/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399917

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			09/19/23 07:53	1

Lab Sample ID: LCS 310-399917/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399917

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	102.0		mg/L		102	75 - 116

Method: I-3765-85 - Residue, Non-filterable (TSS) (Continued)

Lab Sample ID: MB 310-399926/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399926

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			09/19/23 08:42	1

Lab Sample ID: LCS 310-399926/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399926

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			100	109.0		mg/L		109	75 - 116		

Lab Sample ID: 310-264989-4 DU — **Client Sample ID: MW-36**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 399926

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	468			456.0		mg/L				3	35

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

GC/MS VOA

Analysis Batch: 399880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-1	MW-22	Total/NA	Water	8260D	
310-264989-2	MW-11	Total/NA	Water	8260D	
310-264989-3	MW-23	Total/NA	Water	8260D	
310-264989-4	MW-36	Total/NA	Water	8260D	
310-264989-5	MW-DDS	Total/NA	Water	8260D	
310-264989-6	Trip Blank	Total/NA	Water	8260D	
MB 310-399880/5	Method Blank	Total/NA	Water	8260D	
LCS 310-399880/6	Lab Control Sample	Total/NA	Water	8260D	
LCS 310-399880/7	Lab Control Sample	Total/NA	Water	8260D	

Metals

Prep Batch: 399889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-1	MW-22	Total/NA	Water	3005A	
310-264989-2	MW-11	Total/NA	Water	3005A	
310-264989-3	MW-23	Total/NA	Water	3005A	
310-264989-4	MW-36	Total/NA	Water	3005A	
310-264989-5	MW-DDS	Total/NA	Water	3005A	
MB 310-399889/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-399889/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 401021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-1	MW-22	Total/NA	Water	6020B	399889
MB 310-399889/1-A	Method Blank	Total/NA	Water	6020B	399889
LCS 310-399889/2-A	Lab Control Sample	Total/NA	Water	6020B	399889

Analysis Batch: 401086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-2	MW-11	Total/NA	Water	6020B	399889
310-264989-3	MW-23	Total/NA	Water	6020B	399889
310-264989-4	MW-36	Total/NA	Water	6020B	399889

Analysis Batch: 401128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-2	MW-11	Total/NA	Water	6020B	399889
310-264989-3	MW-23	Total/NA	Water	6020B	399889
310-264989-4	MW-36	Total/NA	Water	6020B	399889
310-264989-5	MW-DDS	Total/NA	Water	6020B	399889
LCS 310-399889/2-A	Lab Control Sample	Total/NA	Water	6020B	399889

Analysis Batch: 402212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-5	MW-DDS	Total/NA	Water	6020B	399889

General Chemistry

Analysis Batch: 399917

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-1	MW-22	Total/NA	Water	I-3765-85	

General Chemistry (Continued)

Analysis Batch: 399917 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-5	MW-DDS	Total/NA	Water	I-3765-85	
MB 310-399917/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-399917/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 399926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-264989-2	MW-11	Total/NA	Water	I-3765-85	
310-264989-3	MW-23	Total/NA	Water	I-3765-85	
310-264989-4	MW-36	Total/NA	Water	I-3765-85	
MB 310-399926/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-399926/2	Lab Control Sample	Total/NA	Water	I-3765-85	
310-264989-4 DU	MW-36	Total/NA	Water	I-3765-85	

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-22

Lab Sample ID: 310-264989-1
Matrix: Water

Date Collected: 09/14/23 10:13
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 02:56
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401021	A6US	EET CF	09/29/23 06:54
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: MW-11

Lab Sample ID: 310-264989-2
Matrix: Water

Date Collected: 09/13/23 17:57
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 03:18
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401086	ZRI4	EET CF	09/29/23 15:12
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401128	A6US	EET CF	09/30/23 18:05
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Client Sample ID: MW-23

Lab Sample ID: 310-264989-3
Matrix: Water

Date Collected: 09/13/23 14:51
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 03:40
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401086	ZRI4	EET CF	09/29/23 15:16
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401128	A6US	EET CF	09/30/23 18:08
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Client Sample ID: MW-36

Lab Sample ID: 310-264989-4
Matrix: Water

Date Collected: 09/13/23 10:59
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 04:02
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401086	ZRI4	EET CF	09/29/23 15:19
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401128	A6US	EET CF	09/30/23 18:10
Total/NA	Analysis	I-3765-85		1	399926	DGU1	EET CF	09/19/23 08:42

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Client Sample ID: MW-DDS

Lab Sample ID: 310-264989-5

Date Collected: 09/14/23 10:13
Matrix: Water
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/19/23 04:24
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	402212	A6US	EET CF	10/11/23 13:01
Total/NA	Prep	3005A			399889	QTZ5	EET CF	09/19/23 09:30
Total/NA	Analysis	6020B		1	401128	A6US	EET CF	09/30/23 18:12
Total/NA	Analysis	I-3765-85		1	399917	DGU1	EET CF	09/19/23 07:53

Client Sample ID: Trip Blank

Lab Sample ID: 310-264989-6

Date Collected: 09/14/23 00:00
Matrix: Water
Date Received: 09/15/23 16:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	399880	WSE8	EET CF	09/18/23 22:34

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

Method Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill (Fall 2023 HMSP DS)

Job ID: 310-264989-1
SDG: 27223236.24

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF

Protocol References:

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:

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

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310-264989 Chain of Custody

Cooler/Sample Receipt and Temperature

Client Information			
Client: SCS			
City/State:	CITY	STATE	Project:
Receipt Information			
Date/Time Received:	DATE 9/15/23	TIME 1620	Received By: EM

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~~ 3 EM
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-21, MW-11, MW-23, MW-DUT
MW-36

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R	Correction Factor (°C): 0

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): 1.9

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

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/15/23 TIME 1620 | Received By: EM

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 ~~2~~ 3 EM

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-19, MW-DDS, MW-22, MW-20

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R | Correction Factor (°C): 0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.5 | Corrected Temp (°C): 2.5

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 America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/15/23 | TIME 1620 | Received By: EM

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? ↓

EM

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R | Correction Factor (°C): 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

TestAmerica

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER: SCS Engineers
SITE NAME: Cass County Sanitary Landfill
ADDRESS:
CITY/STATE/ZIP:
TELEPHONE NUMBER: Fax:
SAMPLED BY: (PRINT NAME) Caleb Gomez
SIGNATURE: Caleb Gomez

REPORT TO:
NAME: Ben Madson
COMPANY NAME: SCS Engineers
PROJECT NAME: Cass County Sanitary Landfill (Fall 2023 HMSP DS)
PROJECT NUMBER: 27223236 24
ADDRESS: 1690 All State Ct, Ste 100
CITY/STATE/ZIP: West Des Moines, IA 50265

								Preservative								Matrix						Analyze For											
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	Ice	HNO (Red & White Label)	HCl (Blue & White Label)	NaO (Orange & White Label)	H SO4 Plast (Yellow & White Label)	H2SO4 Glass (Yellow & White Label)	None (Black & White Label)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	Appendix I	Appendix II	Total Suspended Solids	Trip Blank								Fax Results
MW-22		9/14	10:13		X			X								X						X		X									
MW 11		9/13	17:57		X			X								X						X		X									
MW-23		9/13	14:51		X			X								X						X		X									
MW-36		9/13	10:59		X			X								X						X		X									
MW-DDS		9/14	12:13		X			X								X						X		X									
Trip Blank	1														X						X				X								

Relinquished by: Caleb Gomez | Date: 9/15/23 | Time: 14:30 | Received by: | Date: | Time: | Relinquished by: | Time:

Shipped Via: | Comments: | Shipped Via:

Received for lab by: SC | Date: 9/15/23 | Time: 1620 | Temperature Upon Receipt:

Laboratory Comment: (1) For Appendix and analysis report to the reporting limit not the detection limit. Make sure that the reporting limits are below the EPA MCLs.
(2) For analysis other than Appendix and report to the detection limits. Please make sure that the detection limits are below the EPA MCL.
(3) In the "Result" column for all EDD files when non-detect please report the reporting limit or the detection limit instead of indicating with "ND"

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-264989-1
SDG Number: 27223236.24

Login Number: 264989
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins 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	

Appendix B-2

Data Validation Documentation

Completed by:	Sean Marczewski
Date of Sampling:	3/8/2023 - 3/10/2023
Lab Report Date:	5/22/2023
Site Name:	Cass County Sanitary Landfill
Project Type:	HMSP - Water Table - 1st Semi-Annual Sampling Event
Lab Report Number:	310-251194

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			Method 8260D: The following sample(s) was collected in a properly preserved vial; however, the pH was outside the required criteria when verified by the laboratory. The sample was analyzed within the 7-day holding time specified for unpreserved samples: MW-20 (310-251194-3). Method 6020B: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-20 (310-251194-3). The sample(s) was preserved to the appropriate pH in the laboratory.
Condition	X			
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections	X			No detections.
Accuracy				
ICV/CCV	X			
LCS/LCSD		X		Method 8270E: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 310-381115 and analytical batch 310-381339 recovered outside control limits for the following analytes: 4-Chloroaniline.
MS/MSD		X		Method 8270E: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-381115. The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch. Method 8082A: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-381117.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch. Method 8081B: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-381117.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates	X			Sample MW-19 and duplicate MW-DWT had less than 50% RPD for analyzed parameters.

Completed by:	Sean Marczewski
Date of Sampling:	3/9/2023
Lab Report Date:	3/20/2023
Site Name:	Cass County Sanitary Landfill
Project Type:	Supplemental - Natural Attenuation
Lab Report Number:	310-251199

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			Method 6010D: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-20 (310-251199-1). The sample(s) was preserved to the appropriate pH in the laboratory.
Condition	X			
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections			X	
Accuracy				
ICV/CCV	X			
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates			X	

Completed by:	Sean Marczewski
Date of Sampling:	3/10/2023
Lab Report Date:	3/21/2023
Site Name:	Cass County Sanitary Landfill
Project Type:	Supplemental - Geochemistry
Lab Report Number:	310-251200

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			
Condition	X			
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections			X	
Accuracy				
ICV/CCV	X			
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates			X	

Completed by: Sean Marczewski
Date of Sampling: 3/8/2023 - 3/10/2023
Lab Report Date: 3/16/2023
Site Name: Cass County Sanitary Landfill
Project Type: HMSP - Dakota Sandstone - 1st Semi-Annual Sampling Event
Lab Report Number: 310-251201

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			
Condition	X			
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections	X			No detections.
Accuracy				
ICV/CCV	X			Method 8260D: The continuing calibration verification (CCV) associated with batch 310-381097 recovered above the upper control limit for Trichlorofluoromethane (28.6%D). The LCS associated with this CCV passed CCV criteria for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-381097/4).
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates		X		Sample MW-36 and duplicate MW-DDS had less than 50% RPD for analyzed parameters except for Cadmium.

Completed by:	Sean Marczewski
Date of Sampling:	7/21/2023
Lab Report Date:	8/8/2023
Site Name:	Cass County Sanitary Landfill
Project Type:	HMSP - Water Table - July Retest
Lab Report Number:	310-261009

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			
Condition	X			
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections			X	
Accuracy				
ICV/CCV	X			
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates			X	

Completed by:	Sean Marczewski
Date of Sampling:	9/13/2023 & 9/14/2023
Lab Report Date:	10/11/2023
Site Name:	Cass County Sanitary Landfill
Project Type:	HMSP - Water Table - 2nd Semi-Annual Sampling Event
Lab Report Number:	310-264988

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. ICOC sample #3 list 1 container however received 3. Correct container received for requested analysis.
Temperature	X			
Preservation	X			Method 8260D: The following sample was collected in a properly preserved vial; however, the pH was outside the required criteria when verified by the laboratory. The sample was analyzed within the 7-day holding time specified for unpreserved samples: MW-20 (310-264988-3).
Condition	X			Method 8260D: The following volatiles sample was diluted due to foaming at the time of sample analysis during the original sample analysis: UD-0 (310-264988-10). Elevated reporting limits (RLs) are provided. Method 6020B: The following sample was diluted due to the nature of the sample matrix: MW-20 (310-264988-3). Elevated reporting limits (RLs) are provided.
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections	X			No detections.
Accuracy				
ICV/CCV	X			
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates		X		Sample MW-39 and duplicate MW-DWT had less than 50% RPD for analyzed parameters except for Thallium.

Completed by: Sean Marczewski
Date of Sampling: 9/13/2023 & 9/14/2023
Lab Report Date: 10/11/2023
Site Name: Cass County Sanitary Landfill
Project Type: HMSP - Dakota Sandstone - 2nd Semi-Annual Sampling Event
Lab Report Number: 310-264989

	OK	NO	N/A	NOTES
Sample Collection and Sample Handling				
Chain of Custody	X			
Temperature	X			
Preservation	X			
Condition	X			
Case Narrative	X			
Holding Times	X			
Analytical Sensitivty and Blanks				
Method Blank Detections	X			No detections.
Trip Blank Detections		X		No detections. Method 8260D: The method requirement for no headspace was not met. The following volatile sample was analyzed with headspace in the sample container: Trip Blank (310-264989-6).
Accuracy				
ICV/CCV	X			
LCS/LCSD	X			
MS/MSD	X			
Surrogates (organics only)	X			
Other QA QC samples	X			
Precision				
QA/QC Sample RPDs	X			
Field Duplicates	X			Sample MW-22 and duplicate MW-DDS had less than 50% RPD for analyzed parameters except for Nickel.

Appendix C-1

Summary of Groundwater Chemistry – Water Table

SCS ENGINEERS

Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Antimony, mg/L (CAS NO - 7440-36-0)	2/11/2008	N/A	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.00179	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00179	N/A
	7/9/2008	N/A	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.006	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	3/11/2010	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	5/27/2010	< 0.006	N/A	N/A	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	8/31/2010	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	11/4/2010	< 0.006	N/A	N/A	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	2/16/2011	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	7/7/2011	N/A	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	10/27/2011	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	4/26/2012	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	10/9/2012	< 0.006	< 0.012	< 0.012	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	2/20/2013	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	10/3/2013	0.00103	0.00175	0.00116	N/A	N/A	N/A	0.00113	N/A	N/A	N/A
	4/22/2014	< 0.006	< 0.006	< 0.006	N/A	N/A	N/A	< 0.006	N/A	N/A	N/A
	4/22/2014	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.006	< 0.006	N/A	N/A	N/A	N/A	< 0.006	N/A	< 0.006	N/A
	10/14/2014	< 0.006	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.001	0.00077	< 0.001	N/A	N/A	N/A	0.000361	N/A	N/A	N/A
	7/29/2015	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	0.000777*	N/A
	2/15/2016	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	0.000244*	N/A	**0.00157**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	0.00049*	N/A	N/A	N/A
	10/31/2016	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/27/2017	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	0.000255*	< 0.001	< 0.001	N/A	N/A	N/A	0.000204*	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	6/6/2018	< 0.003	< 0.003	< 0.003	N/A	N/A	N/A	< 0.003	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.001	N/A	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/18/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.003	< 0.003	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.001	< 0.001	N/A	N/A	N/A	N/A
	12/2/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	N/A	0.000632*	< 0.001	< 0.001	N/A	N/A	< 0.001
	3/30/2020	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	0.000643*	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	5/6/2021	< 0.002	< 0.002	< 0.002	N/A	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.002	< 0.002	< 0.002	N/A	< 0.002	N/A	< 0.002	N/A	N/A	N/A
	4/6/2022	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.00155*	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	8/23/2022	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002	< 0.002	< 0.002	N/A	N/A
	8/23/2022	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.002	< 0.002	< 0.002	< 0.002	0.00153*	< 0.002	< 0.002	< 0.002	< 0.002	N/A
	3/8/2023	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	0.00165*	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	**0.00225**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
Arsenic, mg/L (CAS NO - 7440-38-2)	2/11/2008	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	0.00178	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00034	N/A
	7/9/2008	N/A	0.00161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	0.00897	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	0.00108	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	0.00173	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	12/15/2009	N/A	N/A	0.00119	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/11/2010	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	5/27/2010	< 0.001	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	8/31/2010	< 0.002	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/4/2010	< 0.001	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	2/16/2011	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	7/7/2011	N/A	0.0725	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	10/27/2011	< 0.001	0.00121	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	4/26/2012	0.0045	0.0196	0.0463	0.0581	N/A	N/A	0.008	N/A	N/A	N/A
	10/9/2012	< 0.001	0.00305	0.00195	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	2/20/2013	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	10/3/2013	0.000644	0.00381	0.00461	N/A	N/A	N/A	0.000211	N/A	N/A	N/A
	4/22/2014	< 0.001	0.00441	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	4/22/2014	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.001	0.00139	N/A	0.0266	N/A	N/A	< 0.001	N/A	0.000761*	N/A
	10/14/2014	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.00147	0.00147	< 0.002	0.0026	N/A	N/A	< 0.002	N/A	N/A	N/A
	7/29/2015	< 0.002	0.00127*	< 0.002	< 0.002	N/A	N/A	< 0.002	N/A	**0.00441**	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Arsenic, mg/L (CAS NO - 7440-38-2)	2/15/2016	0.00134*	< 0.002	< 0.002	**0.00619**	N/A	N/A	< 0.002	N/A	**0.00699**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	10/31/2016	< 0.002	< 0.002	< 0.002	0.000828*	N/A	N/A	< 0.002	N/A	N/A	N/A
	3/27/2017	0.000543*	< 0.002	< 0.002	< 0.002	N/A	N/A	< 0.002	N/A	N/A	N/A
	11/13/2017	0.000608*	0.00118*	0.000827*	0.000618*	N/A	N/A	< 0.002	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	6/6/2018	**0.00167**	**0.00395**	**0.00217**	**0.00154**	N/A	N/A	**0.00147**	N/A	N/A	N/A
	11/26/2018	N/A	0.00124*	N/A	0.000623*	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	0.00128*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	0.00111*	N/A	< 0.002	N/A	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	3/18/2019	0.000859*	< 0.002	**0.00209**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	**0.00121**	**0.00139**	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.002	< 0.002	N/A	N/A	N/A	N/A
	12/2/2019	< 0.002	0.00125*	**0.00348**	< 0.002	< 0.002	0.000842*	< 0.002	0.00126*	N/A	N/A
	3/30/2020	< 0.002	< 0.002	0.00108*	0.000975*	< 0.002	< 0.002	< 0.002	< 0.002	N/A	< 0.002
	3/30/2020	N/A	N/A	0.00102*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.002	0.00145*	**0.00263**	**0.00286**	0.00126*	< 0.002	< 0.002	0.00104*	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	5/6/2021	< 0.002	0.00122*	**0.0029**	0.00198*	0.00078*	< 0.002	< 0.002	0.000768*	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	0.000819*	N/A	N/A	N/A	N/A	N/A
	10/7/2021	**0.00284**	0.00144*	**0.0028**	**0.00209**	0.00075*	N/A	< 0.002	0.00157*	N/A	N/A
	4/6/2022	0.000821*	0.00186*	**0.00374**	0.000893*	0.000888*	< 0.002	< 0.002	< 0.002	**0.0027**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	8/23/2022	< 0.002	0.00127*	**0.00208**	0.00111*	N/A	< 0.002	< 0.002	0.000904*	N/A	N/A
	8/23/2022	N/A	N/A	**0.00249**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	0.00139*	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.002	0.00183*	0.00194*	0.00127*	0.000838*	< 0.002	< 0.002	0.000814*	**0.00254**	N/A
	3/8/2023	N/A	0.00177*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	0.00064*	0.00163*	0.00153*	0.00142*	0.000637*	< 0.002	< 0.002	**0.00242**	**0.00344**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.00101*	N/A	N/A	N/A
Barium, mg/L (CAS NO - 7440-39-3)	2/11/2008	N/A	0.675	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	0.791	N/A	N/A	N/A	N/A	N/A	N/A	0.121	N/A
	7/9/2008	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	0.309	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	0.599	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	0.732	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	0.67	0.782	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	0.546	0.679	N/A	N/A	N/A	0.0397	N/A	N/A	N/A
	12/15/2009	N/A	N/A	0.63	N/A	N/A	N/A	0.0517	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	0.0535	N/A	N/A	N/A
	3/11/2010	0.0547	0.567	0.841	N/A	N/A	N/A	0.0619	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	0.0537	N/A	N/A	N/A
	5/27/2010	0.0503	N/A	N/A	N/A	N/A	N/A	0.0448	N/A	N/A	N/A
	8/31/2010	0.12	0.49	0.801	N/A	N/A	N/A	0.061	N/A	N/A	N/A
	11/4/2010	0.0866	N/A	N/A	N/A	N/A	N/A	0.0675	N/A	N/A	N/A
	2/16/2011	0.0848	0.607	0.743	N/A	N/A	N/A	0.0735	N/A	N/A	N/A
	7/7/2011	N/A	4.44	0.699	N/A	N/A	N/A	0.0725	N/A	N/A	N/A
	10/27/2011	0.0791	0.639	0.633	N/A	N/A	N/A	0.0734	N/A	N/A	N/A
	4/26/2012	0.251	0.918	1.97	0.595	N/A	N/A	0.331	N/A	N/A	N/A
	10/9/2012	0.14	0.99	0.945	N/A	N/A	N/A	0.0881	N/A	N/A	N/A
	2/20/2013	0.131	1.11	1.08	N/A	N/A	N/A	0.0941	N/A	N/A	N/A
	5/15/2013	N/A	1.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/3/2013	0.16	1.01	1.39	N/A	N/A	N/A	0.0791	N/A	N/A	N/A
	4/22/2014	0.171	1.17	1.11	N/A	N/A	N/A	0.0819	N/A	N/A	N/A
	4/22/2014	0.176	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	0.213	1.01	N/A	N/A	N/A	N/A	0.0816	N/A	**0.232**	N/A
	10/14/2014	0.239	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.195	0.978	0.929	N/A	N/A	N/A	0.0798	N/A	N/A	N/A
	7/29/2015	**0.175**	**0.86**	**0.978**	**0.662**	N/A	N/A	**0.0792**	N/A	**0.372**	N/A
	2/15/2016	**0.187**	**0.838**	**0.969**	**0.688**	N/A	N/A	**0.0856**	N/A	**0.592**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	**0.0869**	N/A	N/A	N/A
	10/31/2016	**0.168**	**0.792**	**1**	**0.151**	N/A	N/A	**0.0861**	N/A	N/A	N/A
	3/27/2017	**0.217**	**0.875**	**0.969**	**0.172**	N/A	N/A	**0.0934**	N/A	N/A	N/A
	11/13/2017	**0.193**	**0.978**	**0.958**	**0.198**	N/A	N/A	**0.0785**	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	**0.0788**	N/A	N/A	N/A
	6/6/2018	**0.17**	**1.12**	**0.957**	**0.259**	N/A	N/A	**0.0907**	N/A	N/A	N/A
	11/26/2018	N/A	**1.03**	N/A	**0.2**	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	**1.05**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	**0.199**	N/A	**0.421**	N/A	**0.828**	**0.342**	**0.0933**	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	**0.0916**	N/A	N/A	N/A
	3/18/2019	**0.263**	**1.16**	**0.236**	N/A	**0.826**	**0.439**	**0.107**	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	**0.948**	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	**0.71**	**0.539**	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	**0.879**	**0.65**	N/A	N/A	N/A	N/A
	12/2/2019	**0.208**	**1.03**	**0.969**	N/A	**0.786**	**0.592**	**0.0859**	N/A	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	**0.857**	**0.711**	N/A	N/A	N/A	N/A
	3/30/2020	**0.205**	**1.04**	**1.16**	**0.761**	**0.805**	**0.679**	**0.0989**	N/A	N/A	**0.156**
	3/30/2020	N/A	N/A	**1.2**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	**0.224**	**1.15**	**0.894**	**0.896**	**0.78**	**0.536**	**0.0797**	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	**0.0852**	N/A	N/A	N/A
	5/6/2021	**0.217**	**1.15**	**0.909**	**0.735**	**0.891**	**0.453**	**0.107**	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**0.923**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	**0.207**	**1.14**	**0.733**	**0.785**	**0.911**	N/A	**0.0845**	N/A	N/A	N/A
	4/6/2022	**0.257**	**1.3**	**1.05**	**0.702**	**0.939**	**0.31**	**0.0994**	**0.249**	**0.797**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	**0.0956**	N/A	N/A	N/A
	7/8/2022	N/A	N/A	N/A	**0.679**	N/A	N/A	N/A	N/A	N/A	N/A

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Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Barium, mg/L (CAS NO - 7440-39-3)	8/23/2022	0.248	1.11	1.14	0.774	N/A	0.348	0.0877	0.264	N/A	N/A
	8/23/2022	N/A	N/A	1.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	0.834	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	0.265	1.29	1.21	0.819	0.863	0.261	0.0949	0.202	0.877	N/A
	3/8/2023	N/A	1.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	0.306	1.24	1.24	0.712	0.693	0.212	0.0868	0.348	0.94	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.0918	N/A	N/A	N/A
Beryllium, mg/L (CAS NO - 7440-41-7)	2/11/2008	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	0.00161	N/A	N/A	N/A	N/A	N/A	N/A	< 0.000028	N/A
	7/9/2008	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.001	0.00123	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/11/2010	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	5/27/2010	< 0.001	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	8/31/2010	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/4/2010	< 0.001	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	2/16/2011	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	7/7/2011	N/A	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	10/27/2011	< 0.001	0.00102	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	4/26/2012	< 0.004	< 0.004	0.0104	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	10/9/2012	< 0.001	0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	2/20/2013	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	10/3/2013	< 0.001	0.00032	0.00066	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	4/22/2014	< 0.001	0.000457	0.000246	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	4/22/2014	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.001	0.000469	N/A	N/A	N/A	N/A	< 0.001	N/A	< 0.001	N/A
	10/14/2014	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.001	0.000076	< 0.001	N/A	N/A	N/A	0.000073	N/A	N/A	N/A
	7/29/2015	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	< 0.001	N/A
	2/15/2016	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	< 0.001	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	10/31/2016	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/27/2017	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	6/6/2018	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.001	N/A	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/18/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.001	< 0.001	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.001	< 0.001	N/A	N/A	N/A	N/A
	12/2/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	< 0.001
	3/30/2020	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.001	< 0.001	< 0.001	N/A	0.000342*	< 0.001	< 0.001	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	5/6/2021	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.001	< 0.001	< 0.001	N/A	< 0.001	N/A	< 0.001	N/A	N/A	N/A
	4/6/2022	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	8/23/2022	< 0.001	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A
	8/23/2022	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	3/8/2023	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.000364*	N/A	N/A	N/A
Cadmium, mg/L (CAS NO - 7440-43-9)	2/11/2008	N/A	0.0019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	0.00393	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00017	N/A
	7/9/2008	N/A	0.00147	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	0.00745	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	0.00286	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	0.00125	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	0.00704	0.000974	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	0.0462	< 0.0005	N/A	N/A	N/A	0.00198	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.0005	N/A	N/A	N/A	0.00089	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/11/2010	0.000649	0.00143	0.002	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	5/27/2010	0.00125	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	8/31/2010	0.00111	0.000992	0.000661	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	11/4/2010	0.00061	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	2/16/2011	0.000948	0.00257	0.000861	N/A	N/A	N/A	0.00551	N/A	N/A	N/A
	7/7/2011	N/A	< 0.0005	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	10/27/2011	0.000514	0.00214	< 0.0005	N/A	N/A	N/A	0.0018	N/A	N/A	N/A
	4/26/2012	< 0.0008	0.004	0.0156	N/A	N/A	N/A	0.0013	N/A	N/A	N/A
	10/9/2012	0.000783	0.00222	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	2/20/2013	< 0.0005	0.00228	0.00128	N/A	N/A	N/A	0.00113	N/A	N/A	N/A

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Summary of Groundwater Chemistry
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Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Cadmium, mg/L (CAS NO - 7440-43-9)	10/3/2013	0.00107	0.00185	0.00121	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	4/22/2014	0.000654	0.00258	0.000866	N/A	N/A	N/A	0.0000955	N/A	N/A	N/A
	4/22/2014	0.00144	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	0.000358	0.00293	N/A	N/A	N/A	N/A	< 0.0005	N/A	0.0000776*	N/A
	10/14/2014	0.000231	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.000195	0.00309	0.000216	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	7/29/2015	0.000162*	0.000397*	**0.00191**	N/A	N/A	N/A	< 0.0005	N/A	< 0.0005	N/A
	2/15/2016	< 0.0005	**0.000581**	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	0.000113*	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	10/31/2016	0.00004*	**0.00139**	0.000063*	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/27/2017	0.000048*	**0.00152**	0.000196*	N/A	N/A	N/A	0.00007*	N/A	N/A	N/A
	11/13/2017	0.000089*	0.000088*	0.000378*	N/A	N/A	N/A	0.000089*	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	0.000091*	N/A	N/A	N/A
	6/6/2018	< 0.0005	**0.00148**	0.000264*	N/A	N/A	N/A	0.000173*	N/A	N/A	N/A
	11/26/2018	N/A	**0.000594**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	**0.000594**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.0005	N/A	0.000132*	N/A	0.000207*	0.000132*	< 0.0005	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/18/2019	< 0.0005	**0.00262**	< 0.0005	N/A	0.000196*	0.000151*	< 0.0005	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	0.000241*	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.0005	0.000275*	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	0.000219*	0.000398*	N/A	N/A	N/A	N/A
	12/2/2019	< 0.0001	0.000078*	< 0.0001	N/A	**0.000133**	**0.000321**	< 0.0001	N/A	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	N/A	**0.000391**	N/A	N/A	N/A	N/A
	3/30/2020	< 0.0001	**0.000512**	< 0.0001	N/A	**0.000118**	**0.000525**	< 0.0001	N/A	N/A	< 0.0001
	3/30/2020	N/A	N/A	< 0.0001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.0001	< 0.0001	< 0.0001	N/A	**0.000474**	**0.00022**	< 0.0001	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0001	N/A	N/A	N/A
	5/6/2021	< 0.0001	**0.00204**	< 0.0001	N/A	**0.000343**	**0.000276**	< 0.0001	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**0.000346**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.0001	< 0.0001	< 0.0001	N/A	**0.000339**	N/A	< 0.0001	N/A	N/A	N/A
	4/6/2022	< 0.0001	< 0.0001	< 0.0001	**0.000944**	**0.000224**	**0.000197**	< 0.0001	0.00007*	**0.000296**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0001	N/A	N/A	N/A
	7/8/2022	N/A	N/A	N/A	**0.000696**	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2022	< 0.0001	< 0.0001	< 0.0001	**0.000485**	N/A	**0.000161**	0.000055*	**0.000129**	N/A	N/A
	8/23/2022	N/A	N/A	< 0.0001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	**0.000417**	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.0001	< 0.0001	< 0.0001	**0.000692**	**0.000186**	0.000078*	**0.000129**	0.000065*	**0.000124**	N/A
	3/8/2023	N/A	< 0.0001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.0002	< 0.0002	< 0.0002	**0.000776**	**0.000205**	< 0.0002	< 0.0002	**0.00024**	**0.000305**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	**0.000319**	N/A	N/A	N/A
Chromium, mg/L (CAS NO - 7440-47-3)	2/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.00173	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00173	N/A
	7/9/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/11/2010	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	5/27/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	8/31/2010	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	11/4/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	7/7/2011	N/A	0.0394	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/27/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/26/2012	< 0.02	0.0211	0.0685	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/3/2013	0.00305	0.00234	0.00349	N/A	N/A	N/A	0.00363	N/A	N/A	N/A
	4/22/2014	< 0.02	0.0097	< 0.02	N/A	N/A	N/A	0.00391	N/A	N/A	N/A
	4/22/2014	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.02	< 0.02	N/A	N/A	N/A	N/A	< 0.02	N/A	< 0.02	N/A
	10/14/2014	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.00233	N/A	N/A	N/A
	7/29/2015	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.00172*	N/A	0.00185*	N/A
	2/15/2016	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.00269*	N/A	**0.00516**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	0.00257*	N/A	N/A	N/A
	10/31/2016	0.000743*	< 0.005	0.000575*	N/A	N/A	N/A	0.00177*	N/A	N/A	N/A
	3/27/2017	0.000793*	< 0.005	< 0.005	N/A	N/A	N/A	0.00314*	N/A	N/A	N/A
	11/13/2017	0.000912*	< 0.005	< 0.005	N/A	N/A	N/A	0.0024*	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	0.0024*	N/A	N/A	N/A
	6/6/2018	0.00431*	0.00344*	0.00293*	N/A	N/A	N/A	**0.00528**	N/A	N/A	N/A
	11/26/2018	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	0.000802*	N/A	< 0.005	N/A	< 0.005	< 0.005	0.00261*	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	0.00268*	N/A	N/A	N/A
	3/18/2019	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	0.00316*	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.005	< 0.005	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.005	**0.0146**	N/A	N/A	N/A	N/A
	12/2/2019	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	0.00239*	N/A	N/A	N/A
	3/30/2020	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	0.00253*	N/A	N/A	< 0.005
	3/30/2020	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Chromium, mg/L (CAS NO - 7440-47-3)	11/17/2020	< 0.005	< 0.005	< 0.005	N/A	0.00265*	< 0.005	0.00188*	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	0.00317*	N/A	N/A	N/A
	5/6/2021	< 0.005	< 0.005	< 0.005	N/A	0.00127*	< 0.005	0.00266*	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	0.00141*	N/A	N/A	N/A	N/A	N/A
	10/7/2021	0.00111*	< 0.005	< 0.005	N/A	0.00118*	N/A	0.00159*	N/A	N/A	N/A
	4/6/2022	< 0.005	< 0.005	< 0.005	< 0.005	0.00194*	< 0.005	0.00281*	< 0.005	**0.00665**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	0.00245*	N/A	N/A	N/A
	8/23/2022	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005	0.00134*	< 0.005	N/A	N/A
	8/23/2022	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.00457*	0.00215*	< 0.005	0.00278*	N/A
	3/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.005	< 0.005	< 0.005	< 0.005	0.00465*	0.00375*	0.00124*	< 0.005	**0.00768**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.00303*	N/A	N/A	N/A
Cobalt, mg/L (CAS NO - 7440-48-4)	2/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.0014	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0014	N/A
	7/9/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/11/2010	< 0.00155	0.00252	0.00499	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	5/27/2010	0.00177	N/A	N/A	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	8/31/2010	< 0.00155	< 0.00155	0.01	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	11/4/2010	< 0.00155	N/A	N/A	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	2/16/2011	< 0.00155	0.00214	0.0034	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	7/7/2011	N/A	0.0271	0.0071	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	10/27/2011	< 0.00155	0.00367	< 0.00155	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	4/26/2012	0.002	0.0235	0.224	0.0429	N/A	N/A	0.0156	N/A	N/A	N/A
	10/9/2012	< 0.00155	0.0116	0.0133	N/A	N/A	N/A	< 0.00155	N/A	N/A	N/A
	2/20/2013	< 0.00132	0.0225	0.0121	N/A	N/A	N/A	< 0.00132	N/A	N/A	N/A
	5/15/2013	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.037	N/A	N/A
	10/3/2013	< 0.00132	0.0203	0.0429	N/A	N/A	N/A	< 0.00132	N/A	N/A	N/A
	4/22/2014	< 0.00241	0.0184	0.016	N/A	N/A	N/A	< 0.00241	N/A	N/A	N/A
	4/22/2014	< 0.00241	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.00241	0.0193	N/A	N/A	N/A	N/A	< 0.00241	N/A	< 0.00241	N/A
	10/14/2014	< 0.00241	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.000244	0.0127	0.00162	N/A	N/A	N/A	0.000205	N/A	N/A	N/A
	7/29/2015	0.00007*	**0.0102**	**0.00243**	N/A	N/A	N/A	< 0.0005	0.111	**0.00609**	N/A
	2/15/2016	0.000152*	**0.00981**	0.000074*	N/A	N/A	N/A	< 0.0005	0.000257*	**0.0089**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	10/31/2016	< 0.0005	**0.00708**	**0.00654**	N/A	N/A	N/A	< 0.0005	**0.000703**	N/A	N/A
	3/27/2017	< 0.0005	**0.00631**	0.000356*	N/A	N/A	N/A	< 0.0005	0.000114*	N/A	N/A
	11/13/2017	< 0.0005	**0.0114**	**0.00358**	N/A	N/A	N/A	< 0.0005	0.000301*	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	6/6/2018	< 0.001	**0.0158**	**0.00248**	N/A	N/A	N/A	< 0.001	**0.00212**	N/A	N/A
	11/26/2018	N/A	**0.0168**	N/A	N/A	N/A	N/A	N/A	**0.000723**	N/A	N/A
	11/26/2018	N/A	**0.017**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	**0.00102**	N/A	**0.00133**	N/A	0.000156*	0.000429*	< 0.0005	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/18/2019	0.000214*	**0.0133**	**0.00339**	0.000262*	0.000271*	0.00047*	< 0.0005	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	0.000324*	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.001	**0.00136**	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.0005	**0.00113**	N/A	N/A	N/A	N/A
	12/2/2019	< 0.0005	**0.0155**	**0.0033**	N/A	0.000097*	**0.00384**	< 0.0005	N/A	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	N/A	**0.00262**	N/A	N/A	N/A	N/A
	3/30/2020	< 0.0005	**0.0142**	**0.00175**	**0.00088**	< 0.0005	**0.00317**	< 0.0005	N/A	N/A	< 0.0005
	3/30/2020	N/A	N/A	**0.00165**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.0005	**0.0206**	**0.00186**	N/A	**0.00221**	0.000213*	< 0.0005	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	5/6/2021	< 0.0005	**0.0201**	**0.00164**	N/A	**0.000723**	**0.000501**	< 0.0005	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**0.000761**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.0005	**0.0226**	**0.00268**	N/A	**0.00138**	N/A	< 0.0005	N/A	N/A	N/A
	4/6/2022	0.000464*	**0.0256**	**0.00462**	**0.00313**	**0.00172**	0.000477*	< 0.0005	< 0.0005	**0.022**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	7/8/2022	N/A	N/A	N/A	**0.00366**	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2022	< 0.0005	**0.0213**	**0.00393**	**0.00423**	N/A	0.000261*	< 0.0005	**0.000919**	N/A	N/A
	8/23/2022	N/A	N/A	**0.00395**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	**0.00416**	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	0.000308*	**0.024**	**0.00573**	**0.00283**	**0.00069**	0.000323*	< 0.0005	0.000369*	**0.0089**	N/A
	3/8/2023	N/A	**0.0231**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.0005	**0.0238**	**0.00468**	**0.00323**	**0.00121**	0.000185*	< 0.0005	**0.013**	**0.0278**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	0.000308*	N/A	N/A	N/A
Copper, mg/L (CAS NO - 7440-50-8)	2/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.0131	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0131	N/A
	7/9/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.02	0.0211	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Copper, mg/L (CAS NO - 7440-50-8)	3/11/2010	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	5/27/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	8/31/2010	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	11/4/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	7/7/2011	N/A	0.0232	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/27/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/26/2012	< 0.02	< 0.02	0.127	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	< 0.02	0.0203	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/3/2013	0.00652	0.00361	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/22/2014	0.00521	0.0084	0.00779	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/22/2014	0.00815	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.02	0.00623	N/A	N/A	N/A	N/A	< 0.02	N/A	0.00394*	N/A
	10/14/2014	0.00366	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.00153	0.00159	0.0136	N/A	N/A	N/A	0.00097	N/A	N/A	N/A
	7/29/2015	0.00106*	0.000857*	**0.00504**	N/A	N/A	N/A	< 0.002	N/A	0.00123*	N/A
	2/15/2016	< 0.002	0.000681*	**0.00285**	N/A	N/A	N/A	< 0.002	N/A	**0.0041**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	10/31/2016	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	3/27/2017	< 0.005	< 0.005	0.00262*	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/13/2017	< 0.005	< 0.005	0.00227*	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	6/6/2018	0.000886*	**0.00232**	**0.00261**	N/A	N/A	N/A	0.00108*	N/A	N/A	N/A
	11/26/2018	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.005	N/A	**0.00577**	N/A	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	3/18/2019	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	0.00126*	0.00192*	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.005	< 0.005	N/A	N/A	N/A	N/A
	12/2/2019	< 0.005	0.00306*	< 0.005	N/A	0.00323*	< 0.005	< 0.005	N/A	N/A	N/A
	3/30/2020	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	N/A	N/A	< 0.005
	3/30/2020	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.005	< 0.005	< 0.005	N/A	0.0037*	0.0019*	< 0.005	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	5/6/2021	< 0.005	< 0.005	< 0.005	N/A	0.00177*	0.00245*	< 0.005	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	0.00185*	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.005	< 0.005	< 0.005	N/A	0.0019*	N/A	< 0.005	N/A	N/A	N/A
	4/6/2022	< 0.005	< 0.005	< 0.005	< 0.005	0.00243*	0.00201*	< 0.005	< 0.005	**0.015**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	8/23/2022	< 0.005	< 0.005	< 0.005	< 0.005	N/A	< 0.005	< 0.005	< 0.005	N/A	N/A
	8/23/2022	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	**0.00655**	N/A
	3/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	**0.0186**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
Lead, mg/L (CAS NO - 7439-92-1)	2/11/2008	N/A	< 0.004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	0.0156	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00037	N/A
	7/9/2008	N/A	< 0.004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	0.00698	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.004	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	0.0065	0.0093	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	3/11/2010	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	5/27/2010	< 0.004	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	8/31/2010	< 0.004	< 0.004	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	11/4/2010	< 0.004	N/A	N/A	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	2/16/2011	< 0.004	0.00434	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	7/7/2011	N/A	0.00492	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	10/27/2011	< 0.004	0.00486	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	4/26/2012	< 0.004	0.0249	0.778	N/A	N/A	N/A	0.0115	N/A	N/A	N/A
	10/9/2012	< 0.004	0.00856	< 0.004	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	2/20/2013	< 0.004	0.00497	0.00759	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	10/3/2013	0.00183	0.00559	0.00705	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	4/22/2014	0.00291	0.00817	0.00464	N/A	N/A	N/A	< 0.004	N/A	N/A	N/A
	4/22/2014	0.00193	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.004	0.00769	N/A	N/A	N/A	N/A	< 0.004	N/A	< 0.004	N/A
	10/14/2014	< 0.004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.000264	0.000582	0.000545	N/A	N/A	N/A	0.000777	N/A	N/A	N/A
	7/29/2015	< 0.0005	< 0.0005	0.000199*	N/A	N/A	N/A	0.000124*	N/A	**0.000981**	N/A
	2/15/2016	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	**0.000571**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	10/31/2016	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/27/2017	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	11/13/2017	**0.000518**	< 0.0005	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	6/6/2018	< 0.0005	**0.000836**	0.000186*	N/A	N/A	N/A	0.000299*	N/A	N/A	N/A
	11/26/2018	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Lead, mg/L (CAS NO - 7439-92-1)	11/27/2018	< 0.0005	N/A	< 0.0005	N/A	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	3/18/2019	< 0.0005	< 0.0005	**0.00156**	N/A	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.0005	< 0.0005	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.0005	0.000286*	N/A	N/A	N/A	N/A
	12/2/2019	< 0.0005	< 0.0005	0.000423*	N/A	**0.000719**	0.000278*	< 0.0005	N/A	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A
	3/30/2020	< 0.0005	< 0.0005	< 0.0005	N/A	< 0.0005	0.000403*	< 0.0005	N/A	N/A	< 0.0005
	3/30/2020	N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.0005	< 0.0005	0.000152*	N/A	**0.0038**	< 0.0005	< 0.0005	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	5/6/2021	< 0.0005	< 0.0005	< 0.0005	N/A	**0.00166**	**0.000601**	< 0.0005	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**0.00171**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.0005	< 0.0005	< 0.0005	N/A	**0.00267**	N/A	< 0.0005	N/A	N/A	N/A
	4/6/2022	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**0.0038**	**0.000684**	< 0.0005	< 0.0005	**0.000788**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	8/23/2022	< 0.0005	< 0.0005	< 0.0005	< 0.0005	N/A	0.000363*	< 0.0005	< 0.0005	N/A	N/A
	8/23/2022	N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**0.00159**	< 0.0005	< 0.0005	< 0.0005	0.000358*	N/A
	3/8/2023	N/A	< 0.0005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.0005	< 0.0005	< 0.0005	< 0.0005	**0.00135**	< 0.0005	< 0.0005	< 0.0005	**0.00068**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	**0.000721**	N/A	N/A	N/A
Mercury, mg/L (CAS NO - 7439-97-6)	7/7/2011	N/A	< 0.0002	< 0.0002	N/A	N/A	N/A	< 0.0002	N/A	N/A	N/A
	10/9/2012	N/A	0.000428	< 0.000267	N/A	N/A	N/A	< 0.000267	N/A	N/A	N/A
	2/20/2013	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/3/2013	N/A	0.000196	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/18/2013	N/A	0.000332	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/22/2014	N/A	0.000263	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	N/A	0.000335	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/29/2015	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/15/2016	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/31/2016	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/27/2017	N/A	< 0.0002	< 0.0002	N/A	N/A	N/A	< 0.0002	N/A	N/A	N/A
	11/13/2017	N/A	**0.000255**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	6/6/2018	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/18/2019	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/2/2019	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/30/2020	N/A	< 0.0002	N/A	N/A	< 0.0002	< 0.0002	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0002	< 0.0002	N/A	N/A	N/A	N/A
	5/6/2021	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/7/2021	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0002	< 0.0002	N/A	N/A	N/A	< 0.0002	N/A	N/A	N/A
	8/23/2022	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	< 0.0002	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.0002	N/A	N/A	N/A	N/A	N/A	N/A
Nickel, mg/L (CAS NO - 7440-02-0)	2/11/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.0046	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0046	N/A
	7/9/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.05	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	3/11/2010	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	5/27/2010	< 0.05	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	8/31/2010	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	11/4/2010	< 0.05	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	2/16/2011	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	7/7/2011	N/A	0.127	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	10/27/2011	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	4/26/2012	< 0.05	0.0593	0.204	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	10/9/2012	< 0.05	0.0514	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	2/20/2013	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	5/15/2013	N/A	< 0.05	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A
	10/3/2013	0.00311	0.059	0.0729	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	4/22/2014	< 0.05	0.0756	0.0335	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	4/22/2014	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	0.0118	0.0797	N/A	N/A	N/A	N/A	0.00818	N/A	**0.0505**	N/A
	10/14/2014	0.0119	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.00238	0.0603	0.0172	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	7/29/2015	0.000679*	**0.0585**	**0.0185**	**0.0117**	N/A	N/A	< 0.005	N/A	**0.0427**	N/A
	2/15/2016	< 0.005	**0.0531**	**0.00777**	**0.028**	N/A	N/A	< 0.005	N/A	**0.0727**	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	10/31/2016	< 0.005	**0.0434**	**0.0143**	0.00355*	N/A	N/A	< 0.005	N/A	N/A	N/A
	3/27/2017	< 0.005	**0.0499**	**0.00998**	0.00302*	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/13/2017	< 0.005	**0.0454**	**0.0108**	0.00366*	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	6/6/2018	0.00103*	**0.0605**	**0.0122**	**0.00555**	N/A	N/A	0.000868*	N/A	N/A	N/A
	11/26/2018	N/A	**0.0619**	N/A	0.00272*	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	**0.0635**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Nickel, mg/L (CAS NO - 7440-02-0)	11/27/2018	< 0.005	N/A	**0.00655**	N/A	**0.00776**	**0.00625**	< 0.005	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	3/18/2019	< 0.005	**0.0645**	**0.00609**	N/A	**0.00698**	0.00398*	< 0.005	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	**0.00849**	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	**0.00482**	**0.011**	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	**0.00765**	**0.0108**	N/A	N/A	N/A	N/A
	12/2/2019	< 0.005	**0.0596**	0.00348*	N/A	**0.00772**	**0.0108**	< 0.005	N/A	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	**0.00713**	**0.0105**	N/A	N/A	N/A	N/A
	3/30/2020	< 0.005	**0.0581**	< 0.005	N/A	**0.0059**	**0.00899**	< 0.005	N/A	N/A	< 0.005
	3/30/2020	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.005	**0.0604**	0.00314*	N/A	**0.0105**	**0.00811**	< 0.005	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	5/6/2021	< 0.005	**0.0495**	0.00268*	N/A	**0.00767**	**0.00739**	< 0.005	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**0.00798**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.005	**0.0564**	0.00432*	N/A	**0.00768**	N/A	<0.005	N/A	N/A	N/A
	4/6/2022	< 0.005	**0.0643**	0.00356*	**0.0323**	**0.00593**	0.00277*	< 0.005	0.00311*	**0.121**	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	7/8/2022	N/A	N/A	N/A	**0.029**	N/A	N/A	N/A	N/A	N/A	N/A
	8/23/2022	< 0.005	**0.0638**	0.00346*	**0.0306**	N/A	0.00446*	< 0.005	**0.00523**	N/A	N/A
	8/23/2022	N/A	N/A	0.00364*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	**0.0291**	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	0.00233*	**0.0627**	**0.00853**	**0.0301**	0.00366*	**0.00569**	< 0.005	0.00291*	**0.0768**	N/A
	3/8/2023	N/A	**0.0606**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.005	**0.0431**	0.00444*	**0.0239**	**0.0127**	0.00409*	< 0.005	**0.0059**	**0.128**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
Selenium, mg/L (CAS NO - 7782-49-2)	2/11/2008	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.00144	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00144	N/A
	7/9/2008	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.005	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.005	0.0189	N/A	N/A	N/A	0.0837	N/A	N/A	N/A
	12/15/2009	N/A	N/A	0.0132	N/A	N/A	N/A	0.164	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	0.0784	N/A	N/A	N/A
	3/11/2010	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.081	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	0.0809	N/A	N/A	N/A
	5/27/2010	< 0.005	N/A	N/A	N/A	N/A	N/A	0.0737	N/A	N/A	N/A
	8/31/2010	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0824	N/A	N/A	N/A
	11/4/2010	< 0.005	N/A	N/A	N/A	N/A	N/A	0.0721	N/A	N/A	N/A
	2/16/2011	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0743	N/A	N/A	N/A
	7/7/2011	N/A	< 0.005	< 0.005	N/A	N/A	N/A	0.0813	N/A	N/A	N/A
	10/27/2011	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0973	N/A	N/A	N/A
	4/26/2012	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0059	N/A	N/A	N/A
	10/9/2012	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0858	N/A	N/A	N/A
	2/20/2013	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0424	N/A	N/A	N/A
	10/3/2013	0.00246	< 0.005	< 0.005	N/A	N/A	N/A	0.0576	N/A	N/A	N/A
	4/22/2014	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0713	N/A	N/A	N/A
	4/22/2014	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.005	< 0.005	N/A	N/A	N/A	N/A	0.0668	N/A	< 0.005	N/A
	10/14/2014	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	0.0732	N/A	N/A	N/A
	7/29/2015	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	**0.0734**	N/A	< 0.005	N/A
	2/15/2016	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	**0.0749**	N/A	< 0.005	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	**0.0749**	N/A	N/A	N/A
	10/31/2016	0.00121*	< 0.005	< 0.005	N/A	N/A	N/A	**0.0704**	N/A	N/A	N/A
	3/27/2017	0.00119*	< 0.005	< 0.005	N/A	N/A	N/A	**0.0772**	N/A	N/A	N/A
	11/13/2017	0.00119*	< 0.005	< 0.005	N/A	N/A	N/A	**0.0709**	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	**0.0728**	N/A	N/A	N/A
	6/6/2018	0.00152*	< 0.0025	< 0.0025	N/A	N/A	N/A	**0.0745**	N/A	N/A	N/A
	11/26/2018	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	0.00158*	N/A	< 0.005	N/A	**0.0123**	< 0.005	**0.0742**	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	**0.0778**	N/A	N/A	N/A
	3/18/2019	< 0.005	< 0.005	< 0.005	N/A	**0.00802**	< 0.005	**0.0764**	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	**0.00813**	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	**0.01**	< 0.0025	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	**0.00632**	< 0.005	N/A	N/A	N/A	N/A
	12/2/2019	< 0.005	< 0.005	< 0.005	N/A	**0.00504**	< 0.005	**0.0748**	N/A	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	0.00458*	N/A	N/A	N/A	N/A	N/A
	3/30/2020	0.00129*	< 0.005	< 0.005	N/A	**0.00501**	< 0.005	**0.0731**	N/A	N/A	0.00129*
	3/30/2020	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.005	< 0.005	< 0.005	N/A	**0.0179**	< 0.005	**0.0689**	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	**0.0737**	N/A	N/A	N/A
	5/6/2021	0.00207*	0.00113*	0.00105*	N/A	**0.0127**	0.00177*	**0.0801**	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**0.0132**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	0.00135*	< 0.005	< 0.005	N/A	**0.0119**	N/A	**0.0746**	N/A	N/A	N/A
	4/6/2022	0.001*	< 0.005	< 0.005	< 0.005	**0.0143**	**0.0136**	**0.0814**	**0.0275**	0.00235*	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	**0.0768**	N/A	N/A	N/A
	7/8/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A
	8/23/2022	0.00113*	< 0.005	< 0.005	< 0.005	N/A	**0.0103**	**0.0799**	< 0.005	N/A	N/A
	8/23/2022	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	0.00155*	< 0.005	< 0.005	< 0.005	**0.0201**	**0.0291**	**0.0794**	**0.0244**	0.00145*	N/A
	3/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/21/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A
	9/13/2023	< 0.005	< 0.005	< 0.005	< 0.005	**0.0558**	**0.0264**	**0.0719**	< 0.005	0.00366*	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	**0.0782**	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Silver, mg/L (CAS NO - 7440-22-4)	2/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.00261	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00261	N/A
	7/9/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/11/2010	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	5/27/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	8/31/2010	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	11/4/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	7/7/2011	N/A	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/27/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/26/2012	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/3/2013	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/22/2014	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/22/2014	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.02	< 0.02	N/A	N/A	N/A	N/A	< 0.02	N/A	< 0.02	N/A
	10/14/2014	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	7/29/2015	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	< 0.001	N/A
	2/15/2016	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	< 0.001	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	0.000063*	N/A	N/A	N/A
	10/31/2016	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/27/2017	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	< 0.001	< 0.001	0.000204*	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	6/6/2018	< 0.0005	< 0.0005	< 0.0005	N/A	N/A	N/A	< 0.0005	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.001	N/A	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/18/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.0005	< 0.0005	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.001	< 0.001	N/A	N/A	N/A	N/A
	12/2/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	< 0.001
	3/30/2020	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	5/6/2021	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.001	< 0.001	< 0.001	N/A	< 0.001	N/A	< 0.001	N/A	N/A	N/A
	4/6/2022	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	8/23/2022	< 0.001	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A
	8/23/2022	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	3/8/2023	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
Thallium, mg/L (CAS NO - 7440-28-0)	2/11/2008	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.0007	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0007	N/A
	7/9/2008	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.002	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	3/11/2010	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	5/27/2010	< 0.002	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	8/31/2010	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	11/4/2010	< 0.002	N/A	N/A	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	2/16/2011	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	7/7/2011	N/A	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	10/27/2011	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	4/26/2012	< 0.002	< 0.002	0.0023	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	10/9/2012	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	2/20/2013	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	10/3/2013	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	4/22/2014	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	4/22/2014	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.002	< 0.002	N/A	N/A	N/A	N/A	< 0.002	N/A	< 0.002	N/A
	10/14/2014	< 0.002	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.001	0.000045	0.000033	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	7/29/2015	< 0.001	0.000044*	0.000034*	N/A	N/A	N/A	< 0.001	N/A	0.000086*	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Thallium, mg/L (CAS NO - 7440-28-0)	2/15/2016	< 0.001	0.000035*	0.000035*	N/A	N/A	N/A	< 0.001	N/A	< 0.001	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	10/31/2016	< 0.001	< 0.001	0.000028*	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/27/2017	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	6/6/2018	< 0.002	< 0.002	< 0.002	N/A	N/A	N/A	< 0.002	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.001	N/A	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	3/18/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.002	< 0.002	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.001	< 0.001	N/A	N/A	N/A	N/A
	12/2/2019	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	< 0.001
	3/30/2020	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	5/6/2021	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.001	< 0.001	< 0.001	N/A	< 0.001	N/A	< 0.001	N/A	N/A	N/A
	4/6/2022	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A
	8/23/2022	< 0.001	< 0.001	< 0.001	< 0.001	N/A	< 0.001	< 0.001	< 0.001	N/A	N/A
	8/23/2022	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	3/8/2023	N/A	< 0.001	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	**0.00563**	N/A	N/A	N/A
Tin, mg/L (CAS NO - 7440-31-5)	7/7/2011	N/A	< 0.1	< 0.1	N/A	N/A	N/A	< 0.1	N/A	N/A	N/A
	10/9/2012	N/A	< 0.1	< 0.1	N/A	N/A	N/A	< 0.1	N/A	N/A	N/A
	3/27/2017	N/A	< 0.005	< 0.005	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.005	< 0.005	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.005	< 0.005	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.005	< 0.005	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
Vanadium, mg/L (CAS NO - 7440-62-2)	2/11/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.0016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.0016	N/A
	7/9/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.05	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	3/11/2010	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	5/27/2010	< 0.05	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	8/31/2010	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	11/4/2010	< 0.05	N/A	N/A	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	2/16/2011	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	7/7/2011	N/A	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	10/27/2011	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	4/26/2012	< 0.05	0.0532	0.409	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	10/9/2012	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	2/20/2013	< 0.05	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	10/3/2013	< 0.05	0.00831	0.0263	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	4/22/2014	0.00322	0.0258	0.00978	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	4/22/2014	0.00276	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	0.00269	0.00979	N/A	N/A	N/A	N/A	< 0.05	N/A	< 0.05	N/A
	10/14/2014	< 0.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.005	0.000893	0.000605	N/A	N/A	N/A	0.000911	N/A	N/A	N/A
	7/29/2015	0.000457*	0.000615*	0.00091*	N/A	N/A	N/A	0.000819*	N/A	0.00179*	N/A
	2/15/2016	< 0.005	< 0.005	0.000533*	N/A	N/A	N/A	0.00082*	N/A	0.00324*	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	0.000766*	N/A	N/A	N/A
	10/31/2016	0.000337*	< 0.005	0.000428*	N/A	N/A	N/A	0.000802*	N/A	N/A	N/A
	3/27/2017	< 0.005	< 0.005	0.000999*	N/A	N/A	N/A	0.000986*	N/A	N/A	N/A
	11/13/2017	< 0.005	< 0.005	< 0.005	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	6/6/2018	0.00323*	0.00324*	0.00372*	N/A	N/A	N/A	0.00389*	N/A	N/A	N/A
	11/26/2018	N/A	0.000645*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	0.000673*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	0.000565*	N/A	0.00133*	N/A	0.00166*	0.00107*	0.000862*	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	0.0009*	N/A	N/A	N/A
	3/18/2019	< 0.005	< 0.005	0.00353*	N/A	0.00121*	0.000931*	0.00104*	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	0.00133*	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.005	< 0.005	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	0.00114*	0.00131*	N/A	N/A	N/A	N/A
	12/2/2019	< 0.005	< 0.005	0.00098*	N/A	0.000949*	0.000995*	< 0.005	N/A	N/A	N/A
	3/30/2020	< 0.005	< 0.005	< 0.005	N/A	0.000938*	0.00148*	< 0.005	N/A	N/A	< 0.005
	3/30/2020	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Vanadium, mg/L (CAS NO - 7440-62-2)	11/17/2020	< 0.005	0.000974*	< 0.005	N/A	**0.00829**	0.00154*	0.000941*	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	0.00136*	N/A	N/A	N/A
	5/6/2021	< 0.005	< 0.005	< 0.005	N/A	0.00302*	0.00252*	< 0.005	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	0.00303*	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.005	< 0.005	< 0.005	N/A	0.00351*	N/A	< 0.005	N/A	N/A	N/A
	4/6/2022	< 0.005	< 0.005	< 0.005	< 0.005	**0.00526**	0.00276*	< 0.005	0.00198*	0.00244*	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A
	8/23/2022	< 0.005	< 0.005	< 0.005	< 0.005	N/A	0.00137*	< 0.005	0.00176*	N/A	N/A
	8/23/2022	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.005	< 0.005	< 0.005	< 0.005	0.00272*	< 0.005	< 0.005	0.00178*	0.003*	N/A
	3/8/2023	N/A	< 0.005	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.005	< 0.005	< 0.005	< 0.005	0.0022*	< 0.005	0.00119*	0.00219*	0.00306*	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	**0.00643**	N/A	N/A	N/A
Zinc, mg/L (CAS NO - 7440-66-6)	2/11/2008	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	0.0542	N/A	N/A	N/A	N/A	N/A	N/A	< 0.00527	N/A
	7/9/2008	N/A	0.0947	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	0.0232	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	0.0406	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	0.0433	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	0.0595	0.108	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	0.12	0.0632	N/A	N/A	N/A	0.0378	N/A	N/A	N/A
	12/15/2009	N/A	N/A	0.0663	N/A	N/A	N/A	0.0334	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	0.0339	N/A	N/A	N/A
	3/11/2010	0.0577	0.0719	0.08	N/A	N/A	N/A	0.0373	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	0.0307	N/A	N/A	N/A
	5/27/2010	< 0.02	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	8/31/2010	0.0489	0.035	0.0528	N/A	N/A	N/A	0.0248	N/A	N/A	N/A
	11/4/2010	0.0226	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	7/7/2011	N/A	0.0846	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	10/27/2011	0.0394	0.0422	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/26/2012	0.0238	0.0786	0.461	N/A	N/A	N/A	0.0317	N/A	N/A	N/A
	10/9/2012	0.145	0.025	0.057	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	2/20/2013	0.0511	0.0885	0.0845	N/A	N/A	N/A	0.0374	N/A	N/A	N/A
	10/3/2013	0.185	0.164	0.209	N/A	N/A	N/A	0.0904	N/A	N/A	N/A
	4/22/2014	< 0.02	< 0.02	< 0.04	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	4/22/2014	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.02	< 0.02	N/A	N/A	N/A	N/A	< 0.02	N/A	< 0.02	N/A
	10/14/2014	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	0.00793	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	7/29/2015	< 0.01	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	< 0.01	N/A
	2/15/2016	< 0.01	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	< 0.01	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	10/31/2016	< 0.01	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	3/27/2017	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	11/13/2017	< 0.02	< 0.02	**0.0352**	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	6/6/2018	0.0108*	0.0153*	< 0.02	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	11/26/2018	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.02	N/A	0.0167*	N/A	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	3/18/2019	< 0.02	< 0.02	< 0.02	N/A	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.02	< 0.02	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.02	< 0.02	N/A	N/A	N/A	N/A
	12/2/2019	< 0.02	< 0.02	< 0.02	N/A	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A
	3/30/2020	< 0.02	< 0.02	< 0.02	N/A	< 0.02	< 0.02	< 0.02	N/A	N/A	< 0.02
	3/30/2020	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.02	< 0.02	< 0.02	N/A	0.0139*	< 0.02	< 0.02	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	5/6/2021	< 0.02	< 0.02	< 0.02	N/A	< 0.02	< 0.02	< 0.02	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.02	< 0.02	< 0.02	N/A	< 0.02	N/A	< 0.02	N/A	N/A	N/A
	4/6/2022	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
	8/23/2022	< 0.02	< 0.02	< 0.02	< 0.02	N/A	< 0.02	< 0.02	< 0.02	N/A	N/A
	8/23/2022	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	N/A
	3/8/2023	N/A	< 0.02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.02	< 0.02	< 0.02	< 0.02	0.00727*	< 0.02	< 0.02	< 0.02	0.00874*	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.02	N/A	N/A	N/A
Total Suspended Solids, mg/L (CAS NO - TSS)	4/22/2014	53.5	190	790	93300	N/A	N/A	32.3	142000	N/A	N/A
	4/22/2014	179	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/10/2014	100	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	41.7	730	N/A	5780	N/A	N/A	23.6	497	**4.22**	N/A
	10/14/2014	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	3.5	24.2	12.3	177	N/A	N/A	11.5	514	N/A	N/A
	7/29/2015	**3.75**	**12.4**	**14.9**	**118**	N/A	N/A	1.5*	15300	**6.83**	N/A
	2/15/2016	**2.38**	**2.63**	1*	**120**	N/A	N/A	1.25*	**25.8**	2.67*	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	**1.88**	N/A	N/A	N/A
	10/31/2016	1.5*	0.75*	**3.13**	< 1.88	N/A	N/A	0.875*	**6.5**	N/A	N/A
	3/27/2017	0.625*	1*	**6.5**	< 1.88	N/A	N/A	1*	0.875*	N/A	N/A
	11/13/2017	1.25*	**3.25**	1.25*	< 1.88	N/A	N/A	**3.87**	**10.6**	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	**4.38**	N/A	N/A	N/A
	6/6/2018	< 1.88	**11**	< 1.88	< 1.88	N/A	N/A	1*	**35.8**	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Total Suspended Solids, mg/L (CAS NO - TSS)	11/26/2018	N/A	**3.5**	N/A	0.875*	N/A	N/A	N/A	**6.75**	N/A	N/A
	11/26/2018	N/A	**3.25**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1.88	N/A	**3.13**	N/A	**3.38**	**12.8**	< 1.88	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1.88	N/A	N/A	N/A
	3/18/2019	1.5*	< 1.88	**62**	1.63*	**4**	**3.25**	0.75*	< 1.88	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	1.38*	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	1.63*	**2.5**	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	1.5*	**7.37**	N/A	N/A	N/A	N/A
	12/2/2019	< 1.88	3.5*	**36.7**	1.25*	1.75*	**11**	0.875*	**4.25**	N/A	N/A
	2/28/2020	N/A	N/A	N/A	N/A	**3.13**	**4.75**	N/A	N/A	N/A	N/A
	3/30/2020	< 1.88	0.75*	**11**	0.75*	< 1.88	**8**	< 1.88	< 1.88	N/A	1*
	3/30/2020	N/A	N/A	**9.67**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1.88	**4.8**	24*	**46.4**	**73.5**	0.875*	< 1.88	**5.63**	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1.88	N/A	N/A	N/A
	5/6/2021	< 1.88	1.13*	**16**	**18.5**	**102**	**38.7**	1*	1.25*	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	**186**	N/A	N/A	N/A	N/A	N/A
	10/7/2021	0.875*	**7.62**	**13.6**	**2.5**	**238**	N/A	< 1.88	**29.3**	N/A	N/A
	4/6/2022	< 1.88	**1.88**	**13.5**	1.5*	**181**	**23.5**	< 1.88	0.875*	3.33*	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	1*	N/A	N/A	N/A
	7/8/2022	N/A	N/A	N/A	**4.5**	N/A	N/A	N/A	**2.88**	N/A	N/A
	8/23/2022	< 1.88	**2.5**	**10.8**	1.63*	N/A	**4.37**	< 1.88	**12**	N/A	N/A
	8/23/2022	N/A	N/A	**13.8**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	**2.63**	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1.88	**5.25**	**4.38**	1.63*	**88.5**	**3.75**	0.875*	**2.5**	**2.63**	N/A
	3/8/2023	N/A	1.63*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/21/2023	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**47.5**	N/A	N/A
	9/13/2023	**21.8**	**3.75**	**4.5**	**45**	**100**	**3.75**	1.25*	**25**	**5.75**	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1.88	N/A	N/A	N/A

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.

Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,1,1,2-Tetrachloroethane, ug/L (CAS NO - 630-20-6)	2/11/2008	N/A	< 0.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.33	N/A	N/A	N/A	N/A	N/A	N/A	< 0.33	N/A
	7/9/2008	N/A	< 0.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,1,1-Trichloroethane, ug/L (CAS NO - 71-55-6)	2/11/2008	N/A	< 0.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.19	N/A	N/A	N/A	N/A	N/A	N/A	< 0.19	N/A
	7/9/2008	N/A	< 0.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 5	< 1	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,1,1-Trichloroethane, ug/L (CAS NO - 71-55-6)	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane, ug/L (CAS NO - 79-34-5)	2/11/2008	N/A	< 0.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.23	N/A	N/A	N/A	N/A	N/A	N/A	< 0.23	N/A
	7/9/2008	N/A	< 0.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,1,2,2-Tetrachloroethane, ug/L (CAS NO - 79-34-5)	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,1,2-Trichloroethane, ug/L (CAS NO - 79-00-5)	2/11/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	< 0.37	N/A
	7/9/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,1-Dichloroethane, ug/L (CAS NO - 75-34-3)	2/11/2008	N/A	**0.4**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	**0.26**	N/A	N/A	N/A	N/A	N/A	N/A	< 0.19	N/A
	7/9/2008	N/A	**0.27**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	**1.18**	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	**1.05**	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	**2.28**	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,1-Dichloroethane, ug/L (CAS NO - 75-34-3)	10/14/2014	< 1	**1.26**	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	**1.68**	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	**1.18**	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	**1.01**	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	0.511*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	0.882*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	0.375*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	**1.04**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	0.346*	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	0.587*	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	0.252*	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	0.879*	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	0.729*	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	0.598*	< 1	0.563*	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	0.455*	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	0.426*	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	0.63*	< 1	0.394*	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	0.589*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	0.611*	< 1	0.415*	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,1-Dichloroethene, ug/L (CAS NO - 75-35-4)	2/11/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	< 0.37	N/A
	7/9/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 2	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	5/27/2010	< 2	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/31/2010	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/4/2010	< 2	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/16/2011	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/27/2011	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/3/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/22/2014	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/22/2014	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 2	< 2	N/A	N/A	N/A	N/A	< 2	N/A	< 2	N/A
	10/14/2014	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	7/29/2015	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	< 2	N/A
	2/15/2016	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	< 2	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/31/2016	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/13/2017	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	6/6/2018	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/26/2018	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 2	N/A	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/18/2019	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	12/2/2019	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	3/30/2020	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	< 2
	3/30/2020	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	5/6/2021	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 2	< 2	< 2	N/A	< 2	N/A	< 2	N/A	N/A	N/A

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Summary of Groundwater Chemistry
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Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,1-Dichloroethene, ug/L (CAS NO - 75-35-4)	4/6/2022	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/23/2022	< 2	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A
	8/23/2022	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	N/A
	3/8/2023	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 20	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
1,2,3-Trichloropropane, ug/L (CAS NO - 96-18-4)	2/11/2008	N/A	< 0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.7	N/A	N/A	N/A	N/A	N/A	N/A	< 0.7	N/A
	7/9/2008	N/A	< 0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 2.5	< 2.5	< 2.5	N/A	N/A	N/A	< 2.5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2.5	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,2-Dibromo-3-Chloropropane, ug/L (CAS NO - 96-12-8)	2/11/2008	N/A	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	< 0.86	N/A
	7/9/2008	N/A	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.86	< 0.86	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.498	< 0.498	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.498	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	3/11/2010	< 0.498	< 0.498	< 0.498	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	5/27/2010	< 0.498	N/A	N/A	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	8/31/2010	< 0.498	< 0.498	< 0.498	N/A	N/A	N/A	< 0.498	N/A	N/A	N/A
	11/4/2010	< 0.12	N/A	N/A	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	2/16/2011	< 0.12	< 0.12	< 0.12	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 0.12	< 0.12	< 0.12	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	4/26/2012	N/A	< 0.2	< 0.2	N/A	N/A	N/A	< 0.2	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,2-Dibromo-3-Chloropropane, ug/L (CAS NO - 96-12-8)	10/9/2012	< 0.12	< 0.12	< 0.12	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	2/20/2013	< 0.12	< 0.12	< 0.12	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	10/3/2013	< 0.12	< 0.12	< 0.12	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	4/22/2014	< 0.12	< 0.12	< 0.12	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	4/22/2014	< 0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.12	< 0.12	N/A	N/A	N/A	N/A	< 0.12	N/A	< 0.12	N/A
	10/14/2014	< 0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	7/29/2015	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	< 0.5	N/A
	2/15/2016	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	< 0.5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	10/31/2016	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	3/27/2017	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/13/2017	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	6/6/2018	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/26/2018	N/A	< 1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.5	N/A	< 1.2	N/A	< 1.2	< 0.5	< 1.2	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1.2	N/A	N/A	N/A
	3/18/2019	< 1.2	< 1.2	< 1.2	N/A	< 1.2	< 1.2	< 1.2	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1.2	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1.2	< 1.2	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1.2	< 1.2	N/A	N/A	N/A	N/A
	12/2/2019	< 1.2	< 1.2	< 1.2	N/A	< 1.2	< 1.2	< 1.2	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
1,2-Dibromoethane [EDB], ug/L (CAS NO - 106-93-4)	2/11/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	< 0.25	N/A
	7/9/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.25	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.255	< 0.255	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.255	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	3/11/2010	< 0.255	< 0.255	< 0.255	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	5/27/2010	< 0.255	N/A	N/A	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	8/31/2010	< 0.255	< 0.255	< 0.255	N/A	N/A	N/A	< 0.255	N/A	N/A	N/A
	11/4/2010	< 0.13	N/A	N/A	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	2/16/2011	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	4/26/2012	N/A	< 0.05	< 0.05	N/A	N/A	N/A	< 0.05	N/A	N/A	N/A
	10/9/2012	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	2/20/2013	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	10/3/2013	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	4/22/2014	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	4/22/2014	< 0.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.13	< 0.13	N/A	N/A	N/A	N/A	< 0.13	N/A	< 0.13	N/A
	10/14/2014	< 0.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	7/29/2015	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	< 0.13	N/A
	2/15/2016	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	< 0.13	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	10/31/2016	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	3/27/2017	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	11/13/2017	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	6/6/2018	< 0.13	< 0.13	< 0.13	N/A	N/A	N/A	< 0.13	N/A	N/A	N/A
	11/26/2018	N/A	< 0.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.13	N/A	< 0.34	N/A	< 0.34	< 0.13	< 0.34	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.34	N/A	N/A	N/A
	3/18/2019	< 0.34	< 0.34	< 0.34	N/A	< 0.34	< 0.34	< 0.34	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.34	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.34	< 0.34	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.34	< 0.34	N/A	N/A	N/A	N/A
	12/2/2019	< 0.34	< 0.34	< 0.34	N/A	< 0.34	< 0.34	< 0.34	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,2-Dibromoethane [EDB], ug/L (CAS NO - 106-93-4)	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,2-Dichlorobenzene, ug/L (CAS NO - 95-50-1)	2/11/2008	N/A	< 0.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.21	N/A	N/A	N/A	N/A	N/A	N/A	< 0.21	N/A
	7/9/2008	N/A	< 0.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,2-Dichloroethane, ug/L (CAS NO - 107-06-2)	2/11/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	< 0.2	N/A
	7/9/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,2-Dichloroethane, ug/L (CAS NO - 107-06-2)	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	**1.44**	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,2-Dichloropropane, ug/L (CAS NO - 78-87-5)	2/11/2008	N/A	< 0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.4	N/A	N/A	N/A	N/A	N/A	N/A	< 0.4	N/A
	7/9/2008	N/A	< 0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,2-Dichloropropane, ug/L (CAS NO - 78-87-5)	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
1,4-Dichlorobenzene, ug/L (CAS NO - 106-46-7)	2/11/2008	N/A	< 0.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.16	N/A	N/A	N/A	N/A	N/A	N/A	< 0.16	N/A
	7/9/2008	N/A	**0.16**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	**3.06**	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	0.268*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	0.299*	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	0.323*	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	0.365*	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	0.366*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	0.28*	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
2-Butanone, ug/L (CAS NO - 78-93-3)	2/11/2008	N/A	< 0.91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.91	N/A	N/A	N/A	N/A	N/A	N/A	< 0.91	N/A
	7/9/2008	N/A	< 0.91	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
2-Butanone, ug/L (CAS NO - 78-93-3)	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/26/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
2-Hexanone, ug/L (CAS NO - 591-78-6)	2/11/2008	N/A	< 1.76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 1.76	N/A	N/A	N/A	N/A	N/A	N/A	< 1.76	N/A
	7/9/2008	N/A	< 1.76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 20	N/A	N/A	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/26/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
2-Hexanone, ug/L (CAS NO - 591-78-6)	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
4-Methyl-2-Pentanone, ug/L (CAS NO - 108-10-1)	2/11/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	< 0.31	N/A
	7/9/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/26/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
Acetone, ug/L (CAS NO - 67-64-1)	2/11/2008	N/A	< 4.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 4.62	N/A	N/A	N/A	N/A	N/A	N/A	< 4.62	N/A
	7/9/2008	N/A	< 4.62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	**32.9**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Acetone, ug/L (CAS NO - 67-64-1)	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 10	< 10	10.2	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/26/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	3.53*	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	2.11*	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	3.1*	4.16*	4.17*	N/A	N/A	N/A	3.19*	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	2.32*	N/A	N/A	N/A
	6/6/2018	< 10	4.19*	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	3.43*	3.39*	N/A	3.11*	3.41*	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	3.25*	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	12.2	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	3.18*	5.58*	< 10	< 10	3.23*	4.34*	4.76*	4.57*	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
Acrylonitrile, ug/L (CAS NO - 107-13-1)	2/11/2008	N/A	< 1.28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 1.28	N/A	N/A	N/A	N/A	N/A	N/A	< 1.28	N/A
	7/9/2008	N/A	< 1.28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Acrylonitrile, ug/L (CAS NO - 107-13-1)	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
Benzene, ug/L (CAS NO - 71-43-2)	2/11/2008	N/A	< 0.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.16	N/A	N/A	N/A	N/A	N/A	N/A	< 0.16	N/A
	7/9/2008	N/A	< 0.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 0.5	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	3/11/2010	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	5/27/2010	< 0.5	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	8/31/2010	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/4/2010	< 0.5	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	2/16/2011	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	7/7/2011	N/A	**4.59**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	10/27/2011	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	4/26/2012	N/A	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	10/9/2012	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	2/20/2013	< 0.5	**0.987**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	10/3/2013	< 0.5	**1**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	4/22/2014	< 0.5	**1.21**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	4/22/2014	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 0.5	**0.996**	N/A	N/A	N/A	N/A	< 0.5	N/A	< 0.5	N/A
	10/14/2014	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 0.5	**1.14**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	7/29/2015	< 0.5	**0.821**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	< 0.5	N/A
	2/15/2016	< 0.5	**0.64**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	< 0.5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	10/31/2016	< 0.5	0.216*	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	3/27/2017	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/13/2017	< 0.5	**0.704**	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	6/6/2018	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	11/26/2018	N/A	**0.75**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	**0.553**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 0.5	N/A	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	3/18/2019	< 0.5	< 0.5	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 0.5	< 0.5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 0.5	< 0.5	N/A	N/A	N/A	N/A
	12/2/2019	< 0.5	0.275*	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A
	3/30/2020	< 0.5	< 0.5	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A	< 0.5
	3/30/2020	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 0.5	**0.557**	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	5/6/2021	< 0.5	**0.824**	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 0.5	**0.856**	< 0.5	N/A	< 0.5	N/A	< 0.5	N/A	N/A	N/A
	4/6/2022	< 0.5	**0.93**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A
	8/23/2022	< 0.5	**0.588**	< 0.5	< 0.5	N/A	< 0.5	< 0.5	< 0.5	N/A	N/A
	8/23/2022	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 0.5	**0.912**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	N/A
	3/8/2023	N/A	**0.912**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 0.5	**0.733**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 5	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Bromochloromethane, ug/L (CAS NO - 74-97-5)	2/11/2008	N/A	< 0.76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.76	N/A	N/A	N/A	N/A	N/A	N/A	< 0.76	N/A
	7/9/2008	N/A	< 0.76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 5	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/31/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/4/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/16/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/7/2011	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/27/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 5	< 5	N/A	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	10/14/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/29/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/27/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	6/6/2018	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 5	N/A	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/18/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	12/2/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
Bromodichloromethane, ug/L (CAS NO - 75-27-4)	2/11/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	< 0.2	N/A
	7/9/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Bromodichloromethane, ug/L (CAS NO - 75-27-4)	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Bromoform, ug/L (CAS NO - 75-25-2)	2/11/2008	N/A	< 0.43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.43	N/A	N/A	N/A	N/A	N/A	N/A	< 0.43	N/A
	7/9/2008	N/A	< 0.43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 5	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 20	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 20	N/A	N/A	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	8/31/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/4/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/16/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/7/2011	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/27/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/3/2013	< 5	0.242*	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 5	< 5	N/A	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	10/14/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/29/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/27/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	6/6/2018	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 5	N/A	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/18/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	12/2/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Bromoform, ug/L (CAS NO - 75-25-2)	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
Bromomethane, ug/L (CAS NO - 74-83-9)	2/11/2008	N/A	< 0.48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.48	N/A	N/A	N/A	N/A	N/A	N/A	< 0.48	N/A
	7/9/2008	N/A	< 0.48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 4	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/11/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/4/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/16/2011	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/7/2011	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/27/2011	< 20	< 20	< 20	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	4/26/2012	N/A	< 50	< 50	N/A	N/A	N/A	< 50	N/A	N/A	N/A
	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/3/2013	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/22/2014	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/22/2014	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	10/14/2014	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/29/2015	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	2/15/2016	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	0.245*	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/31/2016	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/27/2017	< 4	< 4	< 4	N/A	N/A	N/A	0.239*	N/A	N/A	N/A
	11/13/2017	< 4	0.861*	0.576*	N/A	N/A	N/A	0.234*	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	0.401*	N/A	N/A	N/A
	6/6/2018	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/26/2018	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 4	N/A	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/18/2019	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	12/2/2019	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	3/30/2020	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	< 4
	3/30/2020	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	5/6/2021	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 4	< 4	< 4	N/A	< 4	N/A	< 4	N/A	N/A	N/A
	4/6/2022	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/23/2022	< 4	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A
	8/23/2022	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A
	3/8/2023	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 40	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
Carbon Disulfide, ug/L (CAS NO - 75-15-0)	2/11/2008	N/A	< 0.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.18	N/A	N/A	N/A	N/A	N/A	N/A	< 0.18	N/A
	7/9/2008	N/A	< 0.18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	**1.52**	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	0.395*	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Carbon Disulfide, ug/L (CAS NO - 75-15-0)	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	0.152*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	0.486*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	0.553*	N/A	N/A
	8/23/2022	N/A	N/A	**4.13**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Carbon Tetrachloride, ug/L (CAS NO - 56-23-5)	2/11/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	< 0.31	N/A
	7/9/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 2	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/4/2010	< 2	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/16/2011	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/27/2011	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/26/2012	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/3/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/22/2014	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/22/2014	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 2	< 2	N/A	N/A	N/A	N/A	< 2	N/A	< 2	N/A
	10/14/2014	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	7/29/2015	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	< 2	N/A
	2/15/2016	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	< 2	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/31/2016	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/13/2017	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	6/6/2018	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/26/2018	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 2	N/A	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/18/2019	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	12/2/2019	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	3/30/2020	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	< 2
	3/30/2020	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	5/6/2021	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 2	< 2	< 2	N/A	< 2	N/A	< 2	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Carbon Tetrachloride, ug/L (CAS NO - 56-23-5)	4/6/2022	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/23/2022	< 2	< 2	< 2	< 2	N/A	< 2	< 2	< 2	N/A	N/A
	8/23/2022	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	N/A
	3/8/2023	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 20	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
Chlorobenzene, ug/L (CAS NO - 108-90-7)	2/11/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	< 0.17	N/A
	7/9/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	**7.35**	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	0.774*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	0.712*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	0.33*	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	0.375*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	0.47*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	0.489*	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	**1.21**	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	**1.45**	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	**1.92**	< 1	0.48*	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	0.761*	< 1	**1.04**	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	0.967*	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	**1.89**	< 1	0.911*	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	**1.86**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	**1.49**	< 1	0.499*	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Chlorodibromomethane, ug/L (CAS NO - 124-48-1)	2/11/2008	N/A	**0.32**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	< 0.26	N/A
	7/9/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 5	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/16/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/7/2011	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/27/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A

SCS ENGINEERS

Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Chlorodibromomethane, ug/L (CAS NO - 124-48-1)	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 5	< 5	N/A	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	10/14/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/29/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/27/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	6/6/2018	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 5	N/A	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/18/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	12/2/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
Chloroethane, ug/L (CAS NO - 75-00-3)	2/11/2008	N/A	**0.79**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	**0.54**	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A
	7/9/2008	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 4	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/11/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/4/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/16/2011	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/7/2011	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/27/2011	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/26/2012	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/9/2012	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/20/2013	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/3/2013	< 4	1.81*	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/22/2014	< 4	2.02*	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/22/2014	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 4	< 4	N/A	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	10/14/2014	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 4	1.02*	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/29/2015	< 4	0.957*	< 4	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	2/15/2016	< 4	0.657*	< 4	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/31/2016	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/27/2017	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/13/2017	< 4	0.581*	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	6/6/2018	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/26/2018	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 4	N/A	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/18/2019	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	12/2/2019	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	3/30/2020	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	< 4
	3/30/2020	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Chloroethane, ug/L (CAS NO - 75-00-3)	11/17/2020	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	5/6/2021	< 4	1.11*	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 4	0.84*	< 4	N/A	< 4	N/A	< 4	N/A	N/A	N/A
	4/6/2022	< 4	1.12*	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/23/2022	< 4	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A
	8/23/2022	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 4	0.877*	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A
	3/8/2023	N/A	1.19*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 40	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
Chloroform, ug/L (CAS NO - 67-66-3)	2/11/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	< 0.17	N/A
	7/9/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/26/2018	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 3	N/A	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/18/2019	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	12/2/2019	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	3/30/2020	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	< 3
	3/30/2020	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	5/6/2021	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 3	< 3	< 3	N/A	< 3	N/A	< 3	N/A	N/A	N/A
	4/6/2022	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	8/23/2022	< 3	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A
	8/23/2022	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A
	3/8/2023	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 30	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
Chloromethane, ug/L (CAS NO - 74-87-3)	2/11/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	< 0.2	N/A
	7/9/2008	N/A	< 0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 3	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/11/2010	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	5/27/2010	< 3	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	8/31/2010	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A

SCS ENGINEERS

Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Chloromethane, ug/L (CAS NO - 74-87-3)	11/4/2010	< 3	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	2/16/2011	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	7/7/2011	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/27/2011	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	4/26/2012	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/9/2012	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	2/20/2013	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/3/2013	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	4/22/2014	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	4/22/2014	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 3	< 3	N/A	N/A	N/A	N/A	< 3	N/A	< 3	N/A
	10/14/2014	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	7/29/2015	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	< 3	N/A
	2/15/2016	< 3	0.321*	< 3	N/A	N/A	N/A	< 3	N/A	0.354*	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/31/2016	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/27/2017	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/13/2017	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	6/6/2018	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/26/2018	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 3	N/A	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/18/2019	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	12/2/2019	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	3/30/2020	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	< 3
	3/30/2020	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	5/6/2021	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 3	< 3	< 3	N/A	< 3	N/A	< 3	N/A	N/A	N/A
	4/6/2022	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	8/23/2022	< 3	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A
	8/23/2022	N/A	N/A	1.61*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A
	3/8/2023	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 30	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
cis-1,2-Dichloroethene, ug/L (CAS NO - 156-59-2)	2/11/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	< 0.37	N/A
	7/9/2008	N/A	< 0.37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	0.744*	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	0.704*	0.2*	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	0.458*	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	0.958*	0.291*	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	0.549*	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	0.539*	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	0.151*	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	0.457*	0.25*	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	0.353*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	0.657*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
cis-1,2-Dichloroethene, ug/L (CAS NO - 156-59-2)	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	0.228*	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	0.357*	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	0.559*	0.301*	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	0.412*	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	0.434*	0.217*	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	0.334*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	0.48*	0.233*	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	0.426*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	0.287*	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
cis-1,3-Dichloropropene, ug/L (CAS NO - 10061-01-5)	2/11/2008	N/A	< 0.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.23	N/A	N/A	N/A	N/A	N/A	N/A	< 0.23	N/A
	7/9/2008	N/A	< 0.23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 5	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/16/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/7/2011	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/27/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 5	< 5	N/A	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	10/14/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/29/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/27/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	6/6/2018	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 5	N/A	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/18/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	12/2/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
Ethylbenzene, ug/L (CAS NO - 100-41-4)	2/11/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	< 0.25	N/A
	7/9/2008	N/A	< 0.25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Ethylbenzene, ug/L (CAS NO - 100-41-4)	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	1.73	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	0.438*	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Iodomethane, ug/L (CAS NO - 74-88-4)	2/11/2008	N/A	< 0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.4	N/A	N/A	N/A	N/A	N/A	N/A	< 0.4	N/A
	7/9/2008	N/A	< 0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 20	< 20	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	10/27/2011	< 20	< 20	< 20	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	4/26/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	5.87*	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Iodomethane, ug/L (CAS NO - 74-88-4)	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
Methylene Bromide, ug/L (CAS NO - 74-95-3)	2/11/2008	N/A	< 0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.3	N/A	N/A	N/A	N/A	N/A	N/A	< 0.3	N/A
	7/9/2008	N/A	< 0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 50	< 50	< 50	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Methylene Chloride, ug/L (CAS NO - 75-09-2)	2/11/2008	N/A	< 0.45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.45	N/A	N/A	N/A	N/A	N/A	N/A	< 0.45	N/A
	7/9/2008	N/A	**0.48**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Methylene Chloride, ug/L (CAS NO - 75-09-2)	12/23/2008	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 5	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/31/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/4/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/16/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/7/2011	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/27/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 5	< 5	N/A	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	10/14/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/29/2015	< 5	0.181*	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	< 5	0.374*	0.643*	N/A	N/A	N/A	0.24*	N/A	0.191*	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/31/2016	0.474*	0.457*	0.275*	N/A	N/A	N/A	0.325*	N/A	N/A	N/A
	3/27/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	6/6/2018	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 5	N/A	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/18/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	12/2/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 10	N/A	< 5	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
Styrene, ug/L (CAS NO - 100-42-5)	2/11/2008	N/A	< 0.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.19	N/A	N/A	N/A	N/A	N/A	N/A	< 0.19	N/A
	7/9/2008	N/A	< 0.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Styrene, ug/L (CAS NO - 100-42-5)	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	0.907*	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Tetrachloroethene, ug/L (CAS NO - 127-18-4)	2/11/2008	N/A	**0.77**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.38	N/A	N/A	N/A	N/A	N/A	N/A	< 0.38	N/A
	7/9/2008	N/A	< 0.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Toluene, ug/L (CAS NO - 108-88-3)	2/11/2008	N/A	< 0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.14	N/A	N/A	N/A	N/A	N/A	N/A	< 0.14	N/A
	7/9/2008	N/A	< 0.14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	**24.3**	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	0.246*	0.202*	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	**23.3**	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	**173**	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	**274**	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	**329**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	**1.21**	**2.12**	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	0.519*	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
trans-1,2-Dichloroethene, ug/L (CAS NO - 156-60-5)	2/11/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	< 0.31	N/A
	7/9/2008	N/A	< 0.31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
trans-1,2-Dichloroethene, ug/L (CAS NO - 156-60-5)	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
trans-1,3-Dichloropropene, ug/L (CAS NO - 10061-02-6)	2/11/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	< 0.17	N/A
	7/9/2008	N/A	< 0.17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 5	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 20	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/27/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 5	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/16/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	4/22/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 5	< 5	N/A	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	10/14/2014	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	7/29/2015	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	< 5	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/27/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	6/6/2018	< 5	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 5	N/A	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/18/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	12/2/2019	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	3/30/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	< 5
	3/30/2020	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	5/6/2021	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 5	< 5	< 5	N/A	< 5	N/A	< 5	N/A	N/A	N/A
	4/6/2022	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5	N/A	< 5	< 5	< 5	N/A	N/A
	8/23/2022	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
trans-1,3-Dichloropropene, ug/L (CAS NO - 10061-02-6)	3/8/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	N/A
	3/8/2023	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 50	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A	N/A
trans-1,4-Dichloro-2-Butene, ug/L (CAS NO - 110-57-6)	2/11/2008	N/A	< 1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 1.8	N/A	N/A	N/A	N/A	N/A	N/A	< 1.8	N/A
	7/9/2008	N/A	< 1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 10	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	< 50	< 50	< 50	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/27/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/31/2010	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/4/2010	< 10	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/16/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/26/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	4/22/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
Trichloroethene, ug/L (CAS NO - 79-01-6)	2/11/2008	N/A	< 0.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.24	N/A	N/A	N/A	N/A	N/A	N/A	< 0.24	N/A
	7/9/2008	N/A	< 0.24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Trichloroethene, ug/L (CAS NO - 79-01-6)	10/14/2014	< 1	0.291*	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Trichlorofluoromethane, ug/L (CAS NO - 75-69-4)	2/11/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	< 0.26	N/A
	7/9/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 4	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/11/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	5/27/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/31/2010	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/4/2010	< 4	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/16/2011	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/7/2011	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/27/2011	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/26/2012	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/9/2012	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	2/20/2013	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/3/2013	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/22/2014	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	4/22/2014	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 4	< 4	N/A	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	10/14/2014	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/29/2015	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	2/15/2016	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	< 4	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/31/2016	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/27/2017	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/13/2017	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	6/6/2018	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	11/26/2018	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 4	N/A	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/18/2019	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	12/2/2019	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	3/30/2020	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	< 4
	3/30/2020	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	5/6/2021	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 4	< 4	< 4	N/A	< 4	N/A	< 4	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Trichlorofluoromethane, ug/L (CAS NO - 75-69-4)	4/6/2022	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/23/2022	< 4	< 4	< 4	< 4	N/A	< 4	< 4	< 4	N/A	N/A
	8/23/2022	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	N/A
	3/8/2023	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 40	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A	N/A
Vinyl Acetate, ug/L (CAS NO - 108-05-4)	2/11/2008	N/A	< 1.36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 1.36	N/A	N/A	N/A	N/A	N/A	N/A	< 1.36	N/A
	7/9/2008	N/A	< 1.36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 2	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	5/27/2010	< 2	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/31/2010	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	11/4/2010	< 2	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/16/2011	< 4	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/27/2011	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/26/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/3/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/22/2014	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	4/22/2014	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 10	< 10	N/A	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	10/14/2014	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	7/29/2015	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	< 10	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	6/6/2018	< 10	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 10	N/A	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/18/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	12/2/2019	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	3/30/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	< 10
	3/30/2020	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	5/6/2021	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 10	< 10	< 10	N/A	< 10	N/A	< 10	N/A	N/A	N/A
	4/6/2022	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10	N/A	< 10	< 10	< 10	N/A	N/A
	8/23/2022	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N/A
	3/8/2023	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 100	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A	N/A
Vinyl Chloride, ug/L (CAS NO - 75-01-4)	2/11/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	< 0.26	N/A
	7/9/2008	N/A	< 0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/27/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/31/2010	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/4/2010	< 1	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/16/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/27/2011	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Vinyl Chloride, ug/L (CAS NO - 75-01-4)	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	4/22/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	7/29/2015	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	< 1	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	6/6/2018	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 1	N/A	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/18/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	12/2/2019	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	3/30/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	< 1
	3/30/2020	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/17/2020	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	5/6/2021	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 1	< 1	N/A	< 1	N/A	< 1	N/A	N/A	N/A
	4/6/2022	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1	N/A	< 1	< 1	< 1	N/A	N/A
	8/23/2022	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	N/A
	3/8/2023	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 10	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A	N/A
Xylenes, total, ug/L (CAS NO - 1330-20-7)	2/11/2008	N/A	< 0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/30/2008	N/A	< 0.3	N/A	N/A	N/A	N/A	N/A	N/A	< 0.3	N/A
	7/9/2008	N/A	< 0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/11/2008	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/10/2008	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/23/2008	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/3/2009	N/A	< 3	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	8/21/2009	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	12/15/2009	N/A	N/A	< 9	N/A	N/A	N/A	< 9	N/A	N/A	N/A
	2/18/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/11/2010	< 7.5	< 7.5	< 7.5	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/11/2010	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	5/27/2010	< 12	N/A	N/A	N/A	N/A	N/A	< 12	N/A	N/A	N/A
	8/31/2010	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/4/2010	< 3	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	2/16/2011	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	7/7/2011	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/27/2011	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	4/26/2012	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/9/2012	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	2/20/2013	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/3/2013	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	4/22/2014	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	4/22/2014	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 3	< 3	N/A	N/A	N/A	N/A	< 3	N/A	< 3	N/A
	10/14/2014	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	7/29/2015	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	< 3	N/A
	2/15/2016	< 3	0.215*	< 3	N/A	N/A	N/A	< 3	N/A	< 3	N/A
	2/15/2016	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/31/2016	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/27/2017	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/13/2017	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/13/2017	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	6/6/2018	< 3	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	11/26/2018	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	< 3	N/A	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	11/27/2018	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/18/2019	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	3/18/2019	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A
	6/5/2019	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	8/22/2019	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	12/2/2019	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	N/A
	3/30/2020	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A	< 3
	3/30/2020	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Xylenes, total, ug/L (CAS NO - 1330-20-7)	11/17/2020	< 3	< 3	< 3	N/A	**5.25**	**10.2**	< 3	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	5/6/2021	0.463*	0.969*	0.44*	N/A	< 3	< 3	0.969*	N/A	N/A	N/A
	5/6/2021	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 3	< 3	< 3	N/A	< 3	N/A	< 3	N/A	N/A	N/A
	4/6/2022	< 3	< 3	< 3	< 3	< 3	0.461*	< 3	< 3	< 3	N/A
	4/6/2022	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	8/23/2022	< 3	< 3	< 3	< 3	N/A	< 3	< 3	< 3	N/A	N/A
	8/23/2022	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	N/A
	3/8/2023	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 30	N/A
	9/13/2023	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A	N/A
M&P-Xylene, ug/L (CAS NO - 179601-23-1)	10/9/2012	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
O-Xylene, ug/L (CAS NO - 95-47-6)	10/9/2012	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.

Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1,1-Dichloropropene, ug/L (CAS NO - 563-58-6)	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
1,2,4,5-Tetrachlorobenzene, ug/L (CAS NO - 95-94-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
1,2,4-Trichlorobenzene, ug/L (CAS NO - 120-82-1)	7/7/2011	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/9/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/27/2017	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
1,3,5-Trinitrobenzene, ug/L (CAS NO - 99-35-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
1,3-Dichlorobenzene, ug/L (CAS NO - 541-73-1)	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
1,3-Dichloropropane, ug/L (CAS NO - 142-28-9)	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
1,3-Dinitrobenzene, ug/L (CAS NO - 99-65-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Naphthoquinone, ug/L (CAS NO - 130-15-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Phenylenediamine, ug/L (CAS NO - 106-50-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
1-Naphthylamine, ug/L (CAS NO - 134-32-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
1-Naphthylamine, ug/L (CAS NO - 134-32-7)	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,2-Dichloropropane, ug/L (CAS NO - 594-20-7)	7/7/2011	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	10/9/2012	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/27/2017	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 4	< 4	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 4	< 4	N/A	N/A	N/A	< 4	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 4	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 4	N/A	N/A	N/A	N/A	N/A	N/A
2,3,4,6-Tetrachlorophenol, ug/L (CAS NO - 58-90-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,4,5-T [2C], ug/L (CAS NO - 93-76-5)	7/7/2011	N/A	< 0.24	< 0.24	N/A	N/A	N/A	< 0.24	N/A	N/A	N/A
	10/9/2012	N/A	< 0.43	< 0.48	N/A	N/A	N/A	< 0.45	N/A	N/A	N/A
	3/27/2017	N/A	< 1.22	< 1.29	N/A	N/A	N/A	< 1.32	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1.06	< 1.01	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.138	< 0.133	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 1.04	< 1.04	N/A	N/A	N/A	< 1.03	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A
2,4,5-TP [Silvex] [2C], ug/L (CAS NO - 93-72-1)	7/7/2011	N/A	< 0.24	< 0.24	N/A	N/A	N/A	< 0.24	N/A	N/A	N/A
	10/9/2012	N/A	< 0.29	< 0.32	N/A	N/A	N/A	< 0.3	N/A	N/A	N/A
	3/27/2017	N/A	< 1.22	< 1.29	N/A	N/A	N/A	< 1.32	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1.06	< 1.01	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.138	< 0.133	N/A	N/A	N/A	N/A
	4/6/2022	N/A	0.869*	< 1.04	N/A	N/A	N/A	< 1.03	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.5	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.5	N/A	N/A	N/A	N/A	N/A	N/A
2,4,5-Trichlorophenol, ug/L (CAS NO - 95-95-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,4,6-Trichlorophenol, ug/L (CAS NO - 88-06-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,4-D [2C], ug/L (CAS NO - 94-75-7)	7/7/2011	N/A	< 0.45	< 0.45	N/A	N/A	N/A	< 0.45	N/A	N/A	N/A
	10/9/2012	N/A	< 0.47	< 0.52	N/A	N/A	N/A	< 0.48	N/A	N/A	N/A
	3/27/2017	N/A	< 1.22	< 1.29	N/A	N/A	N/A	< 1.32	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1.06	< 1.01	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.276	< 0.267	N/A	N/A	N/A	N/A
	4/6/2022	N/A	0.679*	< 1.04	N/A	N/A	N/A	< 1.03	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dichlorophenol, ug/L (CAS NO - 120-83-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dimethylphenol, ug/L (CAS NO - 105-67-9)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	0.583*	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dinitrophenol, ug/L (CAS NO - 51-28-5)	7/7/2011	N/A	< 20	< 20	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	10/9/2012	N/A	< 20	< 65.9	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	3/27/2017	N/A	< 21.7	< 20	N/A	N/A	N/A	< 23	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 20.4	< 20.8	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 21.3	< 20.6	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
2,4-Dinitrophenol, ug/L (CAS NO - 51-28-5)	4/6/2022	N/A	< 20	< 21.7	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 20	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 20	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 20	N/A	N/A	N/A	N/A	N/A	N/A
2,4-Dinitrotoluene, ug/L (CAS NO - 121-14-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,6-Dichlorophenol, ug/L (CAS NO - 87-65-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2,6-Dinitrotoluene, ug/L (CAS NO - 606-20-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Acetylaminofluorene, ug/L (CAS NO - 53-96-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Chloronaphthalene, ug/L (CAS NO - 91-58-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Chlorophenol, ug/L (CAS NO - 95-57-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Methylnaphthalene, ug/L (CAS NO - 91-57-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	0.698*	N/A	N/A	N/A	N/A	N/A	N/A
2-Methylphenol, ug/L (CAS NO - 95-48-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Naphthylamine, ug/L (CAS NO - 91-59-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Nitroaniline, ug/L (CAS NO - 88-74-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
2-Nitroaniline, ug/L (CAS NO - 88-74-4)	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
2-Nitrophenol, ug/L (CAS NO - 88-75-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
3,3-Dichlorobenzidine, ug/L (CAS NO - 91-94-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 54.3	< 50	N/A	N/A	N/A	< 57.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
3,3-Dimethylbenzidine, ug/L (CAS NO - 119-93-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
3/4-Methylphenol, ug/L (CAS NO - T-34MP)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
3-Chloropropene, ug/L (CAS NO - 107-05-1)	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/9/2012	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
3-Methylcholanthrene, ug/L (CAS NO - 56-49-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
3-Nitroaniline, ug/L (CAS NO - 99-09-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4,4`-DDD, ug/L (CAS NO - 72-54-8)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	0.00262*	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
4,4`-DDE, ug/L (CAS NO - 72-55-9)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	0.00274*	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
4,4`-DDT, ug/L (CAS NO - 50-29-3)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	0.00523*	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	0.00774*	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
4,6-Dinitro-2-methylphenol, ug/L (CAS NO - 534-52-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Aminobiphenyl, ug/L (CAS NO - 92-67-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Bromophenyl phenyl ether, ug/L (CAS NO - 101-55-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Chloro-3-methylphenol, ug/L (CAS NO - 59-50-7)	7/7/2011	N/A	**10.9**	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/27/2011	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1/23/2012	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/26/2012	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/22/2014	N/A	< 10.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	N/A	< 10.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/29/2015	N/A	< 10.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/15/2016	N/A	< 10.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/31/2016	N/A	< 10.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	11/13/2017	N/A	< 10.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Chloroaniline, ug/L (CAS NO - 106-47-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Chlorophenyl phenyl ether, ug/L (CAS NO - 7005-72-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Nitroaniline, ug/L (CAS NO - 100-01-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
4-Nitrophenol, ug/L (CAS NO - 100-02-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
4-Nitrophenol, ug/L (CAS NO - 100-02-7)	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
5-Nitro-o-toluidine, ug/L (CAS NO - 99-55-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
7,12-Dimethylbenz [a] anthracene, ug/L (CAS NO - 57-97-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Acenaphthene, ug/L (CAS NO - 83-32-9)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Acenaphthylene, ug/L (CAS NO - 208-96-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Acetonitrile, ug/L (CAS NO - 75-05-8)	7/7/2011	N/A	< 10000	< 10000	N/A	N/A	N/A	< 10000	N/A	N/A	N/A
	10/9/2012	N/A	< 10000	< 10000	N/A	N/A	N/A	< 10000	N/A	N/A	N/A
	3/27/2017	N/A	< 10000	< 10000	N/A	N/A	N/A	< 10000	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10000	< 10000	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10000	< 10000	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10000	< 10000	N/A	N/A	N/A	< 10000	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10000	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10000	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10000	N/A	N/A	N/A	N/A	N/A	N/A
Acetophenone, ug/L (CAS NO - 98-86-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Acrolein, ug/L (CAS NO - 107-02-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Aldrin, ug/L (CAS NO - 309-00-2)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Anthracene, ug/L (CAS NO - 120-12-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Benzo [a] anthracene, ug/L (CAS NO - 56-55-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A

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Summary of Groundwater Chemistry
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Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Benzo [a] anthracene, ug/L (CAS NO - 56-55-3)	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Benzo [a] pyrene, ug/L (CAS NO - 50-32-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Benzo [b] fluoranthene, ug/L (CAS NO - 205-99-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Benzo [g,h,i] perylene, ug/L (CAS NO - 191-24-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Benzo [k] fluoranthene, ug/L (CAS NO - 207-08-9)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Benzyl alcohol, ug/L (CAS NO - 100-51-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Alpha-BHC, ug/L (CAS NO - 319-84-6)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	0.0202*	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	0.00382*	0.00352*	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	0.00277*	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Beta-BHC, ug/L (CAS NO - 319-85-7)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Delta-BHC, ug/L (CAS NO - 319-86-8)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Gamma-BHC [Lindane], ug/L (CAS NO - 58-89-9)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	0.00211*	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
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Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Bis[2-chloroethoxy]methane, ug/L (CAS NO - 111-91-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Bis[2-chloroethyl]ether, ug/L (CAS NO - 111-44-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Bis[2-chloroisopropyl]ether, ug/L (CAS NO - 108-60-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Bis[2-ethylhexyl]phthalate, ug/L (CAS NO - 117-81-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	2*	1.81*	N/A	N/A	N/A	2.15*	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Butyl benzyl phthalate, ug/L (CAS NO - 85-68-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Chlordane, ug/L (CAS NO - 57-74-9)	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/9/2012	N/A	< 2	< 4	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	N/A	< 20.2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 2.25	< 2.22	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 2.17	< 2.11	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 2.17	< 2	N/A	N/A	N/A	< 2.17	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2.04	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
Alpha-Chlordane, ug/L (CAS NO - 5103-71-9)	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
Gamma-Chlordane, ug/L (CAS NO - 5566-34-7)	10/9/2012	N/A	**0.0633**	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	2/20/2013	N/A	< 0.032	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/3/2013	N/A	**0.137**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/18/2013	N/A	**0.124**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/22/2014	N/A	**0.176**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/31/2016	N/A	< 0.174	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/13/2017	N/A	0.029*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	6/6/2018	N/A	0.0207*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/26/2018	N/A	< 0.034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/18/2019	N/A	< 0.034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/2/2019	N/A	< 0.0328	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/30/2020	N/A	**0.0634**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/6/2021	N/A	**0.119**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/7/2021	N/A	< 0.034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorobenzilate, ug/L (CAS NO - 510-15-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Chloroprene, ug/L (CAS NO - 126-99-8)	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/27/2017	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 1	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Chrysene, ug/L (CAS NO - 218-01-9)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Cyanide, mg/L (CAS NO - 57-12-5)	7/7/2011	N/A	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	10/9/2012	N/A	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	3/27/2017	N/A	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.01	< 0.01	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.01	< 0.01	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.01	< 0.01	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.01	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.01	N/A	N/A	N/A	N/A	N/A	N/A
Diallate [cis or trans], ug/L (CAS NO - 2303-16-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Dibenz [a,h] anthracene, ug/L (CAS NO - 53-70-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzofuran, ug/L (CAS NO - 132-64-9)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Dichlorodifluoromethane, ug/L (CAS NO - 75-71-8)	7/7/2011	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	10/9/2012	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/27/2017	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 3	< 3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 3	< 3	N/A	N/A	N/A	< 3	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 3	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 3	N/A	N/A	N/A	N/A	N/A	N/A
Dieldrin, ug/L (CAS NO - 60-57-1)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	0.0428*	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	0.00242*	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Diethyl phthalate, ug/L (CAS NO - 84-66-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Dimethoate, ug/L (CAS NO - 60-51-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Dimethyl phthalate, ug/L (CAS NO - 131-11-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Dimethyl phthalate, ug/L (CAS NO - 131-11-3)	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Dimethylaminoazobenzene, ug/L (CAS NO - 60-11-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Di-n-butyl phthalate, ug/L (CAS NO - 84-74-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	0.665*	0.601*	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Di-n-octyl phthalate, ug/L (CAS NO - 117-84-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 21.7	< 20	N/A	N/A	N/A	< 23	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 20.4	< 20.8	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 21.3	< 20.6	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 20	< 21.7	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 20	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 20	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 20	N/A	N/A	N/A	N/A	N/A	N/A
Dinoseb, ug/L (CAS NO - 88-85-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Diphenylamine, ug/L (CAS NO - 122-39-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Disulfoton, ug/L (CAS NO - 298-04-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Endosulfan I, ug/L (CAS NO - 959-98-8)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Endosulfan II, ug/L (CAS NO - 33213-65-9)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Endosulfan sulfate, ug/L (CAS NO - 1031-07-8)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	0.00465*	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	0.00905*	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Endrin, ug/L (CAS NO - 72-20-8)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	0.00647*	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	0.00544*	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Endrin, ug/L (CAS NO - 72-20-8)	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Endrin aldehyde, ug/L (CAS NO - 7421-93-4)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Ethyl Methacrylate, ug/L (CAS NO - 97-63-2)	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/9/2012	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
Ethyl Methanesulfonate, ug/L (CAS NO - 62-50-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Famphur, ug/L (CAS NO - 52-85-7)	7/7/2011	N/A	< 20	< 20	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	10/9/2012	N/A	< 20	< 65.9	N/A	N/A	N/A	< 20	N/A	N/A	N/A
	3/27/2017	N/A	< 21.7	< 20	N/A	N/A	N/A	< 23	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Fluoranthene, ug/L (CAS NO - 206-44-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Fluorene, ug/L (CAS NO - 86-73-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Heptachlor, ug/L (CAS NO - 76-44-8)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Heptachlor Epoxide, ug/L (CAS NO - 1024-57-3)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Hexachlorobenzene, ug/L (CAS NO - 118-74-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Hexachlorobutadiene, ug/L (CAS NO - 87-68-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A

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Summary of Groundwater Chemistry
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Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Hexachlorobutadiene, ug/L (CAS NO - 87-68-3)	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Hexachlorocyclopentadiene, ug/L (CAS NO - 77-47-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 21.7	< 20	N/A	N/A	N/A	< 23	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Hexachloroethane, ug/L (CAS NO - 67-72-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Hexachloropropene, ug/L (CAS NO - 1888-71-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Indeno [1,2,3-cd] pyrene, ug/L (CAS NO - 193-39-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Isobutanol, mg/L (CAS NO - 78-83-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Isodrin, ug/L (CAS NO - 465-73-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Isophorone, ug/L (CAS NO - 78-59-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Isosafrole, ug/L (CAS NO - 120-58-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Kepone, ug/L (CAS NO - 143-50-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry
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Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Methacrylonitrile, ug/L (CAS NO - 126-98-7)	7/7/2011	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	10/9/2012	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Methapyrilene, ug/L (CAS NO - 91-80-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Methoxychlor, ug/L (CAS NO - 72-43-5)	7/7/2011	N/A	< 0.032	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	10/9/2012	N/A	< 0.032	< 0.064	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/27/2017	N/A	< 0.323	< 0.032	N/A	N/A	N/A	< 0.032	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.036	< 0.0356	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.0348	< 0.0337	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.0696	< 0.064	N/A	N/A	N/A	< 0.0696	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.064	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.0653	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.064	N/A	N/A	N/A	N/A	N/A	N/A
Methyl Methacrylate, ug/L (CAS NO - 80-62-6)	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/9/2012	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 2	< 2	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A
Methyl Methanesulfonate, ug/L (CAS NO - 66-27-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene, ug/L (CAS NO - 91-20-3)	7/7/2011	N/A	**5.41**	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	10/27/2011	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1/23/2012	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/26/2012	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/9/2012	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	2/20/2013	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/3/2013	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/22/2014	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/29/2015	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/15/2016	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/31/2016	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/27/2017	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	11/13/2017	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 5	< 5	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 5	3.55*	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 5	< 5	N/A	N/A	N/A	< 5	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 5	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 5	N/A	N/A	N/A	N/A	N/A	N/A
Nitrobenzene, ug/L (CAS NO - 98-95-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosodiethylamine, ug/L (CAS NO - 55-18-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosodimethylamine, ug/L (CAS NO - 62-75-9)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
N-Nitrosodimethylamine, ug/L (CAS NO - 62-75-9)	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosodi-n-butylamine, ug/L (CAS NO - 924-16-3)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosodi-n-propylamine, ug/L (CAS NO - 621-64-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosodiphenylamine, ug/L (CAS NO - 86-30-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosomethylethylamine, ug/L (CAS NO - 10595-95-6)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosopiperidine, ug/L (CAS NO - 100-75-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
N-Nitrosopyrrolidine, ug/L (CAS NO - 930-55-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
O,O,O-Triethyl Phosphorothioate, ug/L (CAS NO - 126-68-1)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
O-Toluidine, ug/L (CAS NO - 95-53-4)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Parathion-Ethyl, ug/L (CAS NO - 56-38-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Parathion-Methyl, ug/L (CAS NO - 298-00-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry
Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Parathion-Methyl, ug/L (CAS NO - 298-00-0)	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1016, ug/L (CAS NO - 12674-11-2)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1221, ug/L (CAS NO - 11104-28-2)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1232, ug/L (CAS NO - 11141-16-5)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1242, ug/L (CAS NO - 53469-21-9)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1248, ug/L (CAS NO - 12672-29-6)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1254, ug/L (CAS NO - 11097-69-1)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
PCB-1260, ug/L (CAS NO - 11096-82-5)	7/7/2011	N/A	< 0.8	< 0.8	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	10/9/2012	N/A	< 0.8	< 0.909	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A
	3/27/2017	N/A	< 0.842	< 0.808	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 0.899	< 0.889	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 0.87	< 0.842	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 0.87	< 0.8	N/A	N/A	N/A	< 0.87	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 0.8	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 0.816	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 0.8	N/A	N/A	N/A	N/A	N/A	N/A
Pentachlorobenzene, ug/L (CAS NO - 608-93-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Pentachloronitrobenzene, ug/L (CAS NO - 82-68-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Pentachlorophenol [2C], ug/L (CAS NO - 87-86-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Phenacetin, ug/L (CAS NO - 62-44-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Phenanthrene, ug/L (CAS NO - 85-01-8)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Phenol, ug/L (CAS NO - 108-95-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	**62.5**	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	2/20/2013	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/3/2013	N/A	N/A	**34.7**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/18/2013	N/A	N/A	< 10.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/22/2014	N/A	N/A	< 10.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	N/A	N/A	< 10.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/29/2015	N/A	N/A	< 10.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/15/2016	N/A	N/A	< 10.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/31/2016	N/A	N/A	< 11	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	11/13/2017	N/A	N/A	< 100	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Phorate, ug/L (CAS NO - 298-02-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Pronamide, ug/L (CAS NO - 23950-58-5)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Propionitrile, ug/L (CAS NO - 107-12-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Pyrene, ug/L (CAS NO - 129-00-0)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Safrole, ug/L (CAS NO - 94-59-7)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P

Other Constituents	Sample Date	MW-15R UPG	MW-19 DNG	MW-21 DNG	MW-24 DNG	MW-37R DNG	MW-38R DNG	MW-39 DNG	MW-43 DNG	UD-0 DNG	UD-1 DNG
Safrole, ug/L (CAS NO - 94-59-7)	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Sulfide, mg/L (CAS NO - 18496-25-8)	7/7/2011	N/A	**6.4**	**0.29**	N/A	N/A	N/A	< 0.12	N/A	N/A	N/A
	10/27/2011	< 1	< 1	**3.9**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	1/23/2012	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/26/2012	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/9/2012	N/A	**2.6**	**4.5**	N/A	N/A	N/A	< 0.23	N/A	N/A	N/A
	2/20/2013	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/15/2013	N/A	< 1	N/A	< 1	N/A	N/A	N/A	< 1	N/A	N/A
	10/3/2013	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/22/2014	< 1	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/10/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/14/2014	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	5/12/2015	< 1	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7/29/2015	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2/15/2016	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/27/2017	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	11/13/2017	N/A	**3.09**	**4.93**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	6/6/2018	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11/27/2018	N/A	N/A	< 1	N/A	N/A	< 1	N/A	N/A	N/A	N/A
	3/18/2019	N/A	< 1	**2.02**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12/2/2019	N/A	< 1	0.707*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3/30/2020	N/A	< 1	**1.08**	N/A	< 1	< 1	N/A	N/A	N/A	N/A
	11/17/2020	N/A	< 10	< 10	N/A	< 10	< 10	N/A	N/A	N/A	N/A
	5/6/2021	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10/7/2021	< 1	< 10	0.588*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 1	< 1	N/A	N/A	N/A	< 1	N/A	N/A	N/A
	8/23/2022	N/A	< 1	< 1	N/A	N/A	N/A	N/A	< 1	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	< 1	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A
	9/13/2023	N/A	< 1	< 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thionazin, ug/L (CAS NO - 297-97-2)	7/7/2011	N/A	< 10	< 10	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	10/9/2012	N/A	< 10	< 33	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	3/27/2017	N/A	< 10.9	< 10	N/A	N/A	N/A	< 11.5	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 10.2	< 10.4	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 10.6	< 10.3	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 10	< 10.9	N/A	N/A	N/A	< 10	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 10	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 10	N/A	N/A	N/A	N/A	N/A	N/A
Toxaphene, ug/L (CAS NO - 8001-35-2)	7/7/2011	N/A	< 2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	10/9/2012	N/A	< 2	< 4	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/27/2017	N/A	< 20.2	< 2	N/A	N/A	N/A	< 2	N/A	N/A	N/A
	3/30/2020	N/A	N/A	N/A	N/A	< 2.25	< 2.22	N/A	N/A	N/A	N/A
	11/17/2020	N/A	N/A	N/A	N/A	< 2.17	< 2.11	N/A	N/A	N/A	N/A
	4/6/2022	N/A	< 2.17	< 2	N/A	N/A	N/A	< 2.17	N/A	N/A	N/A
	8/23/2022	N/A	N/A	N/A	N/A	N/A	N/A	N/A	< 2	N/A	N/A
	9/29/2022	N/A	N/A	N/A	< 2.04	N/A	N/A	N/A	N/A	N/A	N/A
	3/8/2023	N/A	N/A	N/A	< 2	N/A	N/A	N/A	N/A	N/A	N/A

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.

Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

Appendix C-2

Summary of Groundwater Chemistry – Source

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Antimony, mg/L (CAS NO - 7440-36-0)	9/11/2008	< 0.006	< 0.006
	12/10/2008	< 0.006	< 0.006
	3/3/2009	< 0.006	< 0.006
	8/21/2009	< 0.006	< 0.006
	10/21/2009	N/A	< 0.006
	11/4/2009	< 0.006	N/A
	3/11/2010	< 0.006	< 0.006
	8/31/2010	< 0.006	0.00645
	2/16/2011	< 0.006	< 0.006
	10/27/2011	N/A	< 0.006
	4/26/2012	< 0.006	< 0.006
	10/9/2012	< 0.012	< 0.012
	2/20/2013	N/A	< 0.006
	10/3/2013	N/A	0.00131
	4/22/2014	N/A	< 0.006
	10/14/2014	N/A	< 0.006
	5/12/2015	N/A	0.000312
	7/29/2015	< 0.001	< 0.001
	2/15/2016	N/A	0.000217*
	3/28/2016	< 0.001	N/A
	10/31/2016	< 0.001	0.000333*
	10/31/2016	< 0.001	N/A
	3/27/2017	< 0.001	< 0.001
	11/13/2017	0.000403*	0.000392*
	6/6/2018	< 0.003	< 0.003
	6/6/2018	N/A	< 0.003
	11/27/2018	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001
	5/6/2021	< 0.002	< 0.002
	10/7/2021	< 0.002	< 0.002
	10/7/2021	N/A	< 0.002
	4/6/2022	< 0.002	< 0.002
	8/23/2022	N/A	< 0.002
	3/8/2023	N/A	< 0.002
	9/13/2023	N/A	< 0.008

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Arsenic, mg/L (CAS NO - 7440-38-2)	9/11/2008	0.00152	0.0066
	12/10/2008	0.00394	0.0663
	3/3/2009	0.00699	0.0804
	8/21/2009	0.0252	0.108
	10/21/2009	N/A	0.095
	11/4/2009	0.00619	N/A
	3/11/2010	0.00168	0.0835
	8/31/2010	0.0159	0.02
	2/16/2011	0.0164	0.136
	10/27/2011	N/A	0.0926
	4/26/2012	0.0231	0.0853
	10/9/2012	0.015	0.0491
	2/20/2013	N/A	0.0904
	10/3/2013	N/A	0.153
	4/22/2014	N/A	0.111
	10/14/2014	N/A	0.14
	5/12/2015	N/A	0.0973
	7/29/2015	**0.0106**	**0.0774**
	2/15/2016	N/A	**0.0628**
	3/28/2016	**0.032**	N/A
	10/31/2016	**0.056**	**0.102**
	10/31/2016	**0.0447**	N/A
	3/27/2017	**0.0536**	**0.061**
	11/13/2017	**0.0441**	**0.0811**
	6/6/2018	**0.0457**	**0.062**
	6/6/2018	N/A	**0.0709**
	11/27/2018	**0.0276**	**0.0592**
	3/18/2019	**0.0214**	**0.0433**
	12/2/2019	**0.0352**	**0.0763**
	12/2/2019	**0.0315**	N/A
	3/30/2020	**0.0284**	**0.0564**
	11/17/2020	N/A	**0.0637**
	5/6/2021	**0.0342**	**0.053**
	10/7/2021	**0.0391**	**0.0708**
	10/7/2021	N/A	**0.0809**
	4/6/2022	**0.0401**	**0.0833**
	8/23/2022	N/A	0.00778*
	3/8/2023	N/A	**0.0813**
	9/13/2023	N/A	**0.08**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Barium, mg/L (CAS NO - 7440-39-3)	9/11/2008	0.255	0.646
	12/10/2008	2.28	3.94
	3/3/2009	1.77	4.46
	8/21/2009	2.05	4.15
	10/21/2009	N/A	4.27
	11/4/2009	0.28	N/A
	3/11/2010	0.396	3.76
	8/31/2010	0.429	3.88
	2/16/2011	0.727	4.35
	10/27/2011	N/A	4.77
	4/26/2012	1.82	4.92
	10/9/2012	0.678	4.32
	2/20/2013	N/A	5.54
	10/3/2013	N/A	2.73
	4/22/2014	N/A	2.95
	10/14/2014	N/A	2.4
	5/12/2015	N/A	2.43
	7/29/2015	**0.638**	**2.29**
	2/15/2016	N/A	**2.66**
	3/28/2016	**0.608**	N/A
	10/31/2016	**0.768**	**4.2**
	10/31/2016	**0.728**	N/A
	3/27/2017	**0.799**	**2.19**
	11/13/2017	**0.926**	**3.29**
	6/6/2018	**1.23**	**2.44**
	6/6/2018	N/A	**2.36**
	11/27/2018	**1.13**	**1.93**
	3/18/2019	**1.16**	**2.74**
	12/2/2019	**1.02**	**2.96**
	12/2/2019	**1.1**	N/A
	3/30/2020	**0.933**	**1.85**
	11/17/2020	N/A	**3.32**
	5/6/2021	**1.55**	**2.09**
	10/7/2021	**1.47**	**2.26**
	10/7/2021	N/A	**2.31**
	4/6/2022	**1.62**	**2.12**
	8/23/2022	N/A	**2.47**
	3/8/2023	N/A	**3.8**
	9/13/2023	N/A	**3.32**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Beryllium, mg/L (CAS NO - 7440-41-7)	9/11/2008	< 0.001	< 0.001
	12/10/2008	0.00123	< 0.001
	3/3/2009	< 0.001	< 0.001
	8/21/2009	0.0105	< 0.001
	10/21/2009	N/A	< 0.001
	11/4/2009	0.00184	N/A
	3/11/2010	< 0.001	< 0.001
	8/31/2010	0.00198	< 0.001
	2/16/2011	0.00201	< 0.001
	10/27/2011	N/A	< 0.001
	4/26/2012	< 0.004	< 0.004
	10/9/2012	< 0.001	< 0.001
	2/20/2013	N/A	< 0.001
	10/3/2013	N/A	< 0.001
	4/22/2014	N/A	< 0.001
	10/14/2014	N/A	< 0.001
	5/12/2015	N/A	0.00009
	7/29/2015	< 0.001	< 0.001
	2/15/2016	N/A	< 0.001
	3/28/2016	< 0.001	N/A
	10/31/2016	0.000239*	< 0.001
	10/31/2016	< 0.001	N/A
	3/27/2017	< 0.001	< 0.001
	11/13/2017	< 0.001	< 0.001
	6/6/2018	< 0.001	< 0.001
	6/6/2018	N/A	< 0.001
	11/27/2018	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001
	5/6/2021	< 0.001	< 0.001
	10/7/2021	< 0.001	< 0.004
	10/7/2021	N/A	< 0.004
	4/6/2022	< 0.001	< 0.001
	8/23/2022	N/A	< 0.001
	3/8/2023	N/A	< 0.001
	9/13/2023	N/A	< 0.001

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Cadmium, mg/L (CAS NO - 7440-43-9)	9/11/2008	0.00374	0.0148
	12/10/2008	0.00564	< 0.0005
	3/3/2009	0.00756	0.00112
	8/21/2009	0.0522	0.00624
	10/21/2009	N/A	0.00404
	11/4/2009	0.00935	N/A
	3/11/2010	0.00386	0.000685
	8/31/2010	0.00885	0.00052
	2/16/2011	0.0132	0.00169
	10/27/2011	N/A	0.000827
	4/26/2012	0.008	0.0019
	10/9/2012	0.00711	0.00395
	2/20/2013	N/A	< 0.0005
	10/3/2013	N/A	0.000817
	4/22/2014	N/A	0.000743
	10/14/2014	N/A	0.000693
	5/12/2015	N/A	0.000694
	7/29/2015	< 0.0005	< 0.0005
	2/15/2016	N/A	< 0.0005
	3/28/2016	< 0.0005	N/A
	10/31/2016	**0.00192**	< 0.0005
	10/31/2016	**0.00268**	N/A
	3/27/2017	0.000162*	< 0.0005
	11/13/2017	0.000228*	< 0.0005
	6/6/2018	< 0.0005	< 0.0005
	6/6/2018	N/A	< 0.0005
	11/27/2018	0.000087*	< 0.0005
	3/18/2019	< 0.0005	< 0.0005
	12/2/2019	< 0.0001	< 0.0001
	12/2/2019	< 0.0001	N/A
	3/30/2020	< 0.0001	< 0.0001
	11/17/2020	N/A	< 0.0001
	5/6/2021	< 0.0001	< 0.0001
	10/7/2021	0.000073*	< 0.0001
	10/7/2021	N/A	< 0.0001
	4/6/2022	0.000075*	< 0.0001
	8/23/2022	N/A	< 0.0001
	3/8/2023	N/A	0.000059*
	9/13/2023	N/A	< 0.0002

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chromium, mg/L (CAS NO - 7440-47-3)	9/11/2008	< 0.02	< 0.02
	12/10/2008	< 0.02	< 0.02
	3/3/2009	< 0.02	< 0.02
	8/21/2009	0.0433	< 0.02
	10/21/2009	N/A	< 0.02
	11/4/2009	< 0.02	N/A
	3/11/2010	< 0.02	< 0.02
	8/31/2010	< 0.02	< 0.02
	2/16/2011	< 0.02	< 0.02
	10/27/2011	N/A	< 0.02
	4/26/2012	0.0234	< 0.02
	10/9/2012	< 0.02	< 0.02
	2/20/2013	N/A	< 0.02
	10/3/2013	N/A	0.00411
	4/22/2014	N/A	< 0.02
	10/14/2014	N/A	0.0242
	5/12/2015	N/A	< 0.005
	7/29/2015	< 0.005	< 0.005
	2/15/2016	N/A	< 0.005
	3/28/2016	0.000742*	N/A
	10/31/2016	0.000803*	0.00186*
	10/31/2016	0.00257*	N/A
	3/27/2017	< 0.005	< 0.005
	11/13/2017	< 0.005	0.0013*
	6/6/2018	0.00377*	0.00424*
	6/6/2018	N/A	0.00361*
	11/27/2018	< 0.005	< 0.005
	3/18/2019	< 0.005	0.00114*
	12/2/2019	< 0.005	0.0015*
	12/2/2019	< 0.005	N/A
	3/30/2020	< 0.005	< 0.005
	11/17/2020	N/A	0.00161*
	5/6/2021	< 0.005	< 0.005
	10/7/2021	< 0.005	< 0.02
	10/7/2021	N/A	< 0.02
	4/6/2022	< 0.005	< 0.005
	8/23/2022	N/A	< 0.005
	3/8/2023	N/A	0.00168*
	9/13/2023	N/A	0.00138*

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Cobalt, mg/L (CAS NO - 7440-48-4)	9/11/2008	< 0.02	< 0.02
	12/10/2008	0.0837	0.0233
	3/3/2009	0.184	0.0375
	8/21/2009	0.237	0.0306
	10/21/2009	N/A	0.0255
	11/4/2009	0.133	N/A
	3/11/2010	0.0104	0.0206
	8/31/2010	0.0846	0.022
	2/16/2011	0.122	0.0257
	10/27/2011	N/A	0.0289
	4/26/2012	0.08	0.0292
	10/9/2012	0.0642	0.024
	2/20/2013	N/A	0.0381
	10/3/2013	N/A	0.0174
	4/22/2014	N/A	0.013
	10/14/2014	N/A	0.0146
	5/12/2015	N/A	0.0127
	7/29/2015	**0.0646**	**0.0116**
	2/15/2016	N/A	**0.00989**
	3/28/2016	**0.0545**	N/A
	10/31/2016	**0.0404**	**0.0187**
	10/31/2016	**0.0443**	N/A
	3/27/2017	**0.048**	**0.0123**
	11/13/2017	**0.0396**	**0.0133**
	6/6/2018	**0.0527**	**0.0114**
	6/6/2018	N/A	**0.0123**
	11/27/2018	**0.0378**	**0.00796**
	3/18/2019	**0.0401**	**0.0104**
	12/2/2019	**0.04**	**0.0124**
	12/2/2019	**0.0414**	N/A
	3/30/2020	**0.0412**	**0.00796**
	11/17/2020	N/A	**0.013**
	5/6/2021	**0.0563**	**0.00844**
	10/7/2021	**0.0601**	**0.00823**
	10/7/2021	N/A	**0.0104**
	4/6/2022	**0.0672**	**0.00916**
	8/23/2022	N/A	**0.00882**
	3/8/2023	N/A	**0.0158**
	9/13/2023	N/A	**0.0131**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Copper, mg/L (CAS NO - 7440-50-8)	9/11/2008	< 0.02	< 0.02
	12/10/2008	0.048	< 0.02
	3/3/2009	0.246	< 0.02
	8/21/2009	0.441	0.0334
	10/21/2009	N/A	< 0.02
	11/4/2009	0.113	N/A
	3/11/2010	< 0.02	< 0.02
	8/31/2010	0.0934	< 0.02
	2/16/2011	0.17	< 0.02
	10/27/2011	N/A	0.021
	4/26/2012	0.0894	< 0.02
	10/9/2012	< 0.02	< 0.02
	2/20/2013	N/A	< 0.02
	10/3/2013	N/A	< 0.02
	4/22/2014	N/A	< 0.02
	10/14/2014	N/A	0.00396
	5/12/2015	N/A	0.00218
	7/29/2015	0.000898*	0.000536*
	2/15/2016	N/A	< 0.002
	3/28/2016	< 0.005	N/A
	10/31/2016	**0.0216**	< 0.005
	10/31/2016	**0.0182**	N/A
	3/27/2017	< 0.005	< 0.005
	11/13/2017	0.00334*	< 0.005
	6/6/2018	0.00133*	0.00164*
	6/6/2018	N/A	0.0011*
	11/27/2018	< 0.005	< 0.005
	3/18/2019	< 0.005	< 0.005
	12/2/2019	< 0.005	< 0.005
	12/2/2019	< 0.005	N/A
	3/30/2020	< 0.005	< 0.005
	11/17/2020	N/A	< 0.005
	5/6/2021	< 0.005	< 0.005
	10/7/2021	< 0.005	< 0.02
	10/7/2021	N/A	< 0.02
	4/6/2022	< 0.005	< 0.005
	8/23/2022	N/A	< 0.005
	3/8/2023	N/A	< 0.005
	9/13/2023	N/A	< 0.005

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Lead, mg/L (CAS NO - 7439-92-1)	9/11/2008	< 0.004	0.00538
	12/10/2008	0.0157	< 0.004
	3/3/2009	0.026	0.0106
	8/21/2009	0.0406	0.0275
	10/21/2009	N/A	< 0.004
	11/4/2009	0.00668	N/A
	3/11/2010	0.00437	0.00724
	8/31/2010	0.0146	< 0.004
	2/16/2011	0.0191	0.0126
	10/27/2011	N/A	0.0111
	4/26/2012	0.0225	0.0067
	10/9/2012	0.0045	< 0.004
	2/20/2013	N/A	0.00532
	10/3/2013	N/A	0.0049
	4/22/2014	N/A	0.00225
	10/14/2014	N/A	0.00327
	5/12/2015	N/A	0.00342
	7/29/2015	0.000188*	< 0.0005
	2/15/2016	N/A	0.000177*
	3/28/2016	0.00026*	N/A
	10/31/2016	**0.00353**	0.00022*
	10/31/2016	**0.00502**	N/A
	3/27/2017	0.000484*	< 0.0005
	11/13/2017	**0.000653**	**0.000819**
	6/6/2018	0.000415*	**0.000514**
	6/6/2018	N/A	0.000308*
	11/27/2018	< 0.0005	0.000469*
	3/18/2019	< 0.0005	< 0.0005
	12/2/2019	< 0.0005	< 0.0005
	12/2/2019	< 0.0005	N/A
	3/30/2020	< 0.0005	< 0.0005
	11/17/2020	N/A	< 0.0005
	5/6/2021	< 0.0005	< 0.0005
	10/7/2021	0.000369*	0.000258*
	10/7/2021	N/A	< 0.0005
	4/6/2022	0.000417*	< 0.0005
	8/23/2022	N/A	< 0.0005
	3/8/2023	N/A	< 0.0005
	9/13/2023	N/A	< 0.0005

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Mercury, mg/L (CAS NO - 7439-97-6)	8/21/2009	< 0.0002	< 0.0002
	8/31/2010	< 0.0002	< 0.0002
	10/27/2011	N/A	< 0.0002
	2/15/2016	N/A	0.000118*
	3/28/2016	< 0.0002	N/A
	11/17/2020	N/A	< 0.0002
	5/6/2021	< 0.0002	< 0.0002

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Nickel, mg/L (CAS NO - 7440-02-0)	9/11/2008	< 0.05	< 0.05
	12/10/2008	0.155	0.112
	3/3/2009	0.287	0.14
	8/21/2009	0.274	0.0632
	10/21/2009	N/A	0.127
	11/4/2009	0.167	N/A
	3/11/2010	< 0.05	0.0981
	8/31/2010	0.133	0.111
	2/16/2011	0.169	0.128
	10/27/2011	N/A	0.137
	4/26/2012	0.117	0.147
	10/9/2012	0.0629	0.111
	2/20/2013	N/A	0.158
	10/3/2013	N/A	0.0768
	4/22/2014	N/A	0.0541
	10/14/2014	N/A	0.0604
	5/12/2015	N/A	0.0201
	7/29/2015	**0.0598**	**0.0288**
	2/15/2016	N/A	**0.0456**
	3/28/2016	**0.0379**	N/A
	10/31/2016	**0.0315**	**0.0838**
	10/31/2016	**0.0361**	N/A
	3/27/2017	**0.0394**	**0.0309**
	11/13/2017	**0.0312**	**0.0561**
	6/6/2018	**0.0527**	**0.0318**
	6/6/2018	N/A	**0.0375**
	11/27/2018	**0.0397**	**0.0162**
	3/18/2019	**0.0383**	**0.046**
	12/2/2019	**0.0385**	**0.0582**
	12/2/2019	**0.0384**	N/A
	3/30/2020	**0.0387**	**0.012**
	11/17/2020	N/A	**0.0716**
	5/6/2021	**0.0631**	**0.0205**
	10/7/2021	**0.0774**	**0.0373**
	10/7/2021	N/A	**0.047**
	4/6/2022	**0.0908**	**0.0312**
	8/23/2022	N/A	**0.065**
	3/8/2023	N/A	**0.0787**
	9/13/2023	N/A	**0.0487**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Selenium, mg/L (CAS NO - 7782-49-2)	9/11/2008	< 0.005	< 0.005
	12/10/2008	< 0.005	< 0.005
	3/3/2009	< 0.005	< 0.005
	8/21/2009	< 0.005	< 0.005
	10/21/2009	N/A	< 0.005
	11/4/2009	< 0.005	N/A
	3/11/2010	0.025	< 0.005
	8/31/2010	< 0.005	< 0.005
	2/16/2011	< 0.005	< 0.005
	10/27/2011	N/A	< 0.005
	4/26/2012	0.0062	0.0274
	10/9/2012	< 0.005	< 0.005
	2/20/2013	N/A	< 0.005
	10/3/2013	N/A	< 0.005
	4/22/2014	N/A	< 0.005
	10/14/2014	N/A	< 0.005
	5/12/2015	N/A	< 0.005
	7/29/2015	< 0.005	< 0.005
	2/15/2016	N/A	< 0.005
	3/28/2016	< 0.005	N/A
	10/31/2016	< 0.005	< 0.005
	10/31/2016	< 0.005	N/A
	3/27/2017	< 0.005	< 0.005
	11/13/2017	< 0.005	< 0.005
	6/6/2018	< 0.0025	< 0.0025
	6/6/2018	N/A	< 0.0025
	11/27/2018	< 0.005	< 0.005
	3/18/2019	**0.00581**	< 0.005
	12/2/2019	< 0.005	< 0.005
	12/2/2019	< 0.005	N/A
	3/30/2020	< 0.005	< 0.005
	11/17/2020	N/A	< 0.005
	5/6/2021	0.00117*	0.00139*
	10/7/2021	< 0.005	< 0.005
	10/7/2021	N/A	< 0.005
	4/6/2022	< 0.005	< 0.005
	8/23/2022	N/A	< 0.005
	3/8/2023	N/A	0.00108*
	9/13/2023	N/A	< 0.005

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Silver, mg/L (CAS NO - 7440-22-4)	9/11/2008	< 0.02	< 0.02
	12/10/2008	< 0.02	< 0.02
	3/3/2009	< 0.02	< 0.02
	8/21/2009	< 0.02	< 0.02
	10/21/2009	N/A	< 0.02
	11/4/2009	< 0.02	N/A
	3/11/2010	< 0.02	< 0.02
	8/31/2010	< 0.02	< 0.02
	2/16/2011	< 0.02	< 0.02
	10/27/2011	N/A	< 0.02
	4/26/2012	< 0.02	< 0.02
	10/9/2012	< 0.02	< 0.02
	2/20/2013	N/A	< 0.02
	10/3/2013	N/A	< 0.02
	4/22/2014	N/A	< 0.02
	10/14/2014	N/A	< 0.02
	5/12/2015	N/A	0.000081
	7/29/2015	< 0.001	< 0.001
	2/15/2016	N/A	< 0.001
	3/28/2016	< 0.001	N/A
	10/31/2016	< 0.001	< 0.001
	10/31/2016	< 0.001	N/A
	3/27/2017	< 0.001	< 0.001
	11/13/2017	< 0.001	< 0.001
	6/6/2018	< 0.0005	< 0.0005
	6/6/2018	N/A	< 0.0005
	11/27/2018	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001
	5/6/2021	< 0.001	< 0.001
	10/7/2021	< 0.001	< 0.004
	10/7/2021	N/A	< 0.004
	4/6/2022	< 0.001	< 0.001
	8/23/2022	N/A	< 0.001
	3/8/2023	N/A	< 0.001
	9/13/2023	N/A	< 0.001

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Thallium, mg/L (CAS NO - 7440-28-0)	9/11/2008	< 0.002	< 0.002
	12/10/2008	< 0.002	< 0.002
	3/3/2009	< 0.002	< 0.004
	8/21/2009	< 0.002	< 0.002
	10/21/2009	N/A	< 0.002
	11/4/2009	< 0.002	N/A
	3/11/2010	< 0.002	< 0.002
	8/31/2010	< 0.002	< 0.002
	2/16/2011	< 0.002	< 0.002
	10/27/2011	N/A	< 0.003
	4/26/2012	< 0.002	< 0.002
	10/9/2012	< 0.002	< 0.002
	2/20/2013	N/A	< 0.002
	10/3/2013	N/A	< 0.002
	4/22/2014	N/A	< 0.002
	10/14/2014	N/A	< 0.002
	5/12/2015	N/A	< 0.001
	7/29/2015	0.00022*	< 0.001
	2/15/2016	N/A	< 0.001
	3/28/2016	0.000147*	N/A
	10/31/2016	0.000185*	< 0.001
	10/31/2016	0.000186*	N/A
	3/27/2017	0.000172*	< 0.001
	11/13/2017	0.000141*	< 0.001
	6/6/2018	< 0.002	< 0.002
	6/6/2018	N/A	< 0.002
	11/27/2018	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	< 0.001
	12/2/2019	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001
	5/6/2021	< 0.001	< 0.001
	10/7/2021	< 0.001	< 0.004
	10/7/2021	N/A	< 0.004
	4/6/2022	< 0.001	< 0.001
	8/23/2022	N/A	< 0.001
	3/8/2023	N/A	< 0.001
	9/13/2023	N/A	< 0.001

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Tin, mg/L (CAS NO - 7440-31-5)	8/21/2009	< 0.1	< 0.1
	8/31/2010	< 0.1	< 0.1
	10/27/2011	N/A	0.117
	4/26/2012	N/A	< 0.1
	10/9/2012	N/A	< 0.1
	2/20/2013	N/A	< 0.1
	10/3/2013	N/A	0.427
	4/22/2014	N/A	< 0.1
	10/14/2014	N/A	0.127
	5/12/2015	N/A	< 0.005
	7/29/2015	N/A	< 0.005
	2/15/2016	N/A	< 0.005
	3/28/2016	< 0.005	N/A
	10/31/2016	N/A	< 0.005
	3/27/2017	N/A	< 0.005
	11/13/2017	N/A	< 0.005
	6/6/2018	N/A	< 0.005
	11/27/2018	N/A	< 0.005
	3/18/2019	N/A	< 0.005
	12/2/2019	N/A	< 0.005
	5/6/2021	< 0.005	< 0.005

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Vanadium, mg/L (CAS NO - 7440-62-2)	9/11/2008	< 0.05	< 0.05
	12/10/2008	< 0.05	< 0.05
	3/3/2009	0.0589	< 0.05
	8/21/2009	0.151	< 0.05
	10/21/2009	N/A	< 0.05
	11/4/2009	< 0.05	N/A
	3/11/2010	< 0.05	< 0.05
	8/31/2010	< 0.05	< 0.05
	2/16/2011	< 0.05	< 0.05
	10/27/2011	N/A	< 0.05
	4/26/2012	< 0.05	< 0.05
	10/9/2012	< 0.05	< 0.05
	2/20/2013	N/A	< 0.05
	10/3/2013	N/A	0.00522
	4/22/2014	N/A	0.00392
	10/14/2014	N/A	0.00505
	5/12/2015	N/A	0.0031
	7/29/2015	0.000503*	0.00196*
	2/15/2016	N/A	0.00267*
	3/28/2016	0.000576*	N/A
	10/31/2016	**0.00513**	0.00396*
	10/31/2016	0.00324*	N/A
	3/27/2017	< 0.005	0.00107*
	11/13/2017	< 0.005	0.00307*
	6/6/2018	0.00262*	0.00364*
	6/6/2018	N/A	**0.00513**
	11/27/2018	< 0.005	0.00123*
	3/18/2019	< 0.005	0.00193*
	12/2/2019	< 0.005	0.00357*
	12/2/2019	< 0.005	N/A
	3/30/2020	< 0.005	0.00109*
	11/17/2020	N/A	0.0046*
	5/6/2021	< 0.005	0.00164*
	10/7/2021	< 0.005	< 0.02
	10/7/2021	N/A	< 0.02
	4/6/2022	< 0.005	0.00259*
	8/23/2022	N/A	< 0.005
	3/8/2023	N/A	0.00379*
	9/13/2023	N/A	0.00368*

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Zinc, mg/L (CAS NO - 7440-66-6)	9/11/2008	0.0356	0.0529
	12/10/2008	0.0395	< 0.02
	3/3/2009	0.115	0.198
	8/21/2009	0.204	0.345
	10/21/2009	N/A	0.165
	11/4/2009	0.101	N/A
	3/11/2010	0.0582	0.157
	8/31/2010	0.0404	0.0435
	2/16/2011	0.0714	0.332
	10/27/2011	N/A	0.124
	4/26/2012	0.0649	0.119
	10/9/2012	< 0.02	0.0712
	2/20/2013	N/A	0.102
	10/3/2013	N/A	0.237
	4/22/2014	N/A	< 0.04
	10/14/2014	N/A	0.0369
	5/12/2015	N/A	0.0376
	7/29/2015	< 0.01	< 0.01
	2/15/2016	N/A	< 0.01
	3/28/2016	< 0.01	N/A
	10/31/2016	0.00636*	< 0.01
	10/31/2016	0.00723*	N/A
	3/27/2017	< 0.02	0.0177*
	11/13/2017	< 0.02	< 0.02
	6/6/2018	< 0.02	< 0.02
	6/6/2018	N/A	0.00921*
	11/27/2018	< 0.02	< 0.02
	3/18/2019	< 0.02	< 0.02
	12/2/2019	< 0.02	< 0.02
	12/2/2019	< 0.02	N/A
	3/30/2020	< 0.02	< 0.02
	11/17/2020	N/A	< 0.02
	5/6/2021	< 0.02	< 0.02
	10/7/2021	< 0.02	< 0.02
	10/7/2021	N/A	< 0.02
	4/6/2022	< 0.02	< 0.02
	8/23/2022	N/A	< 0.02
	3/8/2023	N/A	< 0.02
	9/13/2023	N/A	< 0.02

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Total Metals Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Total Suspended Solids, mg/L (CAS NO - TSS)	4/22/2014	N/A	118
	10/14/2014	N/A	175
	5/12/2015	N/A	288
	7/29/2015	**66.9**	**118**
	2/15/2016	N/A	**118**
	3/28/2016	**54.9**	N/A
	10/31/2016	**79**	**172**
	10/31/2016	**270**	N/A
	3/27/2017	**64.6**	**80.1**
	5/31/2017	**27.5**	**64**
	7/12/2017	**145**	**156**
	11/13/2017	**68.1**	**133**
	6/6/2018	**41**	**133**
	6/6/2018	N/A	**28.4**
	11/27/2018	**15.5**	**92**
	3/18/2019	**13.5**	**102**
	12/2/2019	**23**	**114**
	12/2/2019	**17.5**	N/A
	3/30/2020	**19.5**	**130**
	11/17/2020	N/A	**112**
	5/6/2021	**25.1**	**109**
	10/7/2021	**124**	**93.3**
	10/7/2021	N/A	**111**
	4/6/2022	**35**	**123**
	8/23/2022	N/A	**100**
	3/8/2023	N/A	**114**
	9/13/2023	N/A	**151**

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1,1,2-Tetrachloroethane, ug/L (CAS NO - 630-20-6)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 2.1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1,1-Trichloroethane, ug/L (CAS NO - 71-55-6)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 5	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.2
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1,2,2-Tetrachloroethane, ug/L (CAS NO - 79-34-5)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1,2-Trichloroethane, ug/L (CAS NO - 79-00-5)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 1.2
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1-Dichloroethane, ug/L (CAS NO - 75-34-3)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 2.1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1-Dichloroethene, ug/L (CAS NO - 75-35-4)	9/11/2008	< 2	< 2
	12/10/2008	< 2	< 10
	3/3/2009	< 2	< 10
	8/21/2009	< 2	< 10
	10/21/2009	N/A	< 2
	11/4/2009	< 2	N/A
	3/11/2010	< 2	< 2
	8/31/2010	< 2	< 10
	2/16/2011	< 2	< 10
	10/27/2011	N/A	< 10
	4/26/2012	< 1	< 5
	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 2
	10/3/2013	N/A	< 2
	4/22/2014	N/A	< 20
	10/14/2014	N/A	< 2
	5/12/2015	N/A	< 2
	7/29/2015	< 2	< 2
	2/15/2016	N/A	< 20
	3/28/2016	< 2	N/A
	10/31/2016	< 2	< 2
	10/31/2016	< 2	N/A
	3/27/2017	< 2	< 2
	11/13/2017	< 2	< 20
	6/6/2018	< 2	< 2
	6/6/2018	N/A	< 2
	11/27/2018	< 2	< 2
	3/18/2019	< 2	< 2
	12/2/2019	< 2	< 2
	12/2/2019	< 2	N/A
	3/30/2020	< 2	< 2
	11/17/2020	N/A	< 20
	5/6/2021	< 2	< 2
	10/7/2021	< 2	< 2
	10/7/2021	N/A	< 2
	4/6/2022	< 2	< 2
	8/23/2022	N/A	< 2
	3/8/2023	N/A	< 2
	9/13/2023	N/A	< 2

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,2,3-Trichloropropane, ug/L (CAS NO - 96-18-4)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 2.5
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.9
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,2-Dibromo-3-Chloropropane, ug/L (CAS NO - 96-12-8)	9/11/2008	< 0.86	< 0.86
	12/10/2008	< 0.86	< 4.3
	3/3/2009	< 0.86	< 4.3
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 0.498
	11/4/2009	< 0.498	N/A
	3/11/2010	< 0.498	< 0.498
	8/31/2010	< 10	< 50
	2/16/2011	< 0.12	< 0.6
	10/27/2011	N/A	< 0.6
	4/26/2012	< 0.2	< 0.2
	10/9/2012	< 0.12	< 0.6
	2/20/2013	N/A	< 1.2
	10/3/2013	N/A	< 0.12
	4/22/2014	N/A	< 1.2
	10/14/2014	N/A	< 0.12
	5/12/2015	N/A	< 0.5
	7/29/2015	< 0.5	< 0.5
	2/15/2016	N/A	< 5
	3/28/2016	< 0.5	N/A
	10/31/2016	< 0.5	< 0.5
	10/31/2016	< 0.5	N/A
	3/27/2017	< 0.5	< 0.5
	11/13/2017	< 0.5	< 5
	6/6/2018	< 0.5	< 0.5
	6/6/2018	N/A	< 0.5
	11/27/2018	< 0.5	< 1.2
	3/18/2019	< 1.2	< 1.2
	12/2/2019	< 1.2	< 1.2
	12/2/2019	< 1.2	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,2-Dibromoethane [EDB], ug/L (CAS NO - 106-93-4)	9/11/2008	< 0.25	< 0.25
	12/10/2008	< 0.25	< 1.25
	3/3/2009	< 0.25	< 1.25
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 0.255
	11/4/2009	< 0.255	N/A
	3/11/2010	< 0.255	< 0.255
	8/31/2010	< 10	< 50
	2/16/2011	< 0.13	< 0.65
	10/27/2011	N/A	< 0.65
	4/26/2012	< 0.05	< 0.05
	10/9/2012	< 0.13	< 0.65
	2/20/2013	N/A	< 1.3
	10/3/2013	N/A	< 0.13
	4/22/2014	N/A	< 1.3
	10/14/2014	N/A	< 0.13
	5/12/2015	N/A	< 0.13
	7/29/2015	< 0.13	< 0.13
	2/15/2016	N/A	< 1.3
	3/28/2016	< 0.13	N/A
	10/31/2016	< 0.13	< 0.13
	10/31/2016	< 0.13	N/A
	3/27/2017	< 0.13	< 0.13
	11/13/2017	< 0.13	< 1.3
	6/6/2018	< 0.13	< 0.13
	6/6/2018	N/A	< 0.13
	11/27/2018	< 0.13	< 0.34
	3/18/2019	< 0.34	< 0.34
	12/2/2019	< 0.34	< 0.34
	12/2/2019	< 0.34	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,2-Dichlorobenzene, ug/L (CAS NO - 95-50-1)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.4
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,2-Dichloroethane, ug/L (CAS NO - 107-06-2)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.8
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,2-Dichloropropane, ug/L (CAS NO - 78-87-5)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 8.7
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,4-Dichlorobenzene, ug/L (CAS NO - 106-46-7)	9/11/2008	< 1	< 1
	12/10/2008	**1.6**	< 5
	3/3/2009	**1.38**	< 5
	8/21/2009	**1.1**	< 5
	10/21/2009	N/A	< 2
	11/4/2009	**1.01**	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 2
	10/3/2013	N/A	**2.88**
	4/22/2014	N/A	< 10
	10/14/2014	N/A	**1.92**
	5/12/2015	N/A	< 1
	7/29/2015	< 1	**1.56**
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	2.82*
	6/6/2018	0.25*	**2.11**
	6/6/2018	N/A	**1.99**
	11/27/2018	< 1	**1.98**
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	**1.81**
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	**2.37**
	10/7/2021	N/A	< 1
	4/6/2022	0.298*	**1.94**
	8/23/2022	N/A	**1.79**
	3/8/2023	N/A	**2.4**
	9/13/2023	N/A	**2.48**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
2-Butanone, ug/L (CAS NO - 78-93-3)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 10	N/A
	3/11/2010	< 10	< 10
	8/31/2010	< 10	< 50
	2/16/2011	< 10	< 50
	10/27/2011	N/A	< 50
	4/26/2012	< 10	< 50
	10/9/2012	< 10	< 50
	2/20/2013	N/A	< 10
	10/3/2013	N/A	< 10
	4/22/2014	N/A	< 100
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	< 10	< 10
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	< 10	< 10
	8/23/2022	N/A	< 10
	3/8/2023	N/A	< 10
	9/13/2023	N/A	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
2-Hexanone, ug/L (CAS NO - 591-78-6)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 10	N/A
	3/11/2010	< 10	< 10
	8/31/2010	< 10	< 50
	2/16/2011	< 10	< 50
	10/27/2011	N/A	< 50
	4/26/2012	< 10	< 50
	10/9/2012	< 10	< 50
	2/20/2013	N/A	< 10
	10/3/2013	N/A	< 10
	4/22/2014	N/A	< 100
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	< 10	< 10
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	< 10	< 10
	8/23/2022	N/A	< 10
	3/8/2023	N/A	< 10
	9/13/2023	N/A	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
4-Methyl-2-Pentanone, ug/L (CAS NO - 108-10-1)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 10	N/A
	3/11/2010	< 10	< 10
	8/31/2010	< 10	< 50
	2/16/2011	< 10	< 50
	10/27/2011	N/A	< 50
	4/26/2012	< 10	< 50
	10/9/2012	< 10	< 50
	2/20/2013	N/A	< 10
	10/3/2013	N/A	< 10
	4/22/2014	N/A	< 100
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	< 10	< 10
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	< 10	< 10
	8/23/2022	N/A	< 10
	3/8/2023	N/A	< 10
	9/13/2023	N/A	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Acetone, ug/L (CAS NO - 67-64-1)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 10	N/A
	3/11/2010	< 10	**17.9**
	8/31/2010	< 10	< 50
	2/16/2011	< 10	**100**
	10/27/2011	N/A	< 50
	4/26/2012	< 10	< 50
	10/9/2012	< 10	< 50
	2/20/2013	N/A	**24.4**
	10/3/2013	N/A	< 10
	4/22/2014	N/A	26.7*
	10/14/2014	N/A	< 10
	5/12/2015	N/A	**52.1**
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	**14.7**	N/A
	10/31/2016	2.72*	4.17*
	10/31/2016	< 10	N/A
	3/27/2017	4.18*	2.73*
	11/13/2017	2.94*	23.4*
	6/6/2018	< 10	**10.6**
	6/6/2018	N/A	5.75*
	11/27/2018	3.76*	< 10
	3/18/2019	< 10	7.76*
	12/2/2019	< 10	6.21*
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	3.64*	4.94*
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	3.55*	< 10
	8/23/2022	N/A	8.49*
	3/8/2023	N/A	6.42*
	9/13/2023	N/A	8.1*

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Acrylonitrile, ug/L (CAS NO - 107-13-1)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 10	N/A
	3/11/2010	< 10	< 10
	8/31/2010	< 10	< 50
	2/16/2011	< 10	< 50
	10/27/2011	N/A	< 50
	4/26/2012	< 5	< 25
	10/9/2012	< 10	< 50
	2/20/2013	N/A	< 10
	10/3/2013	N/A	< 10
	4/22/2014	N/A	< 100
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Benzene, ug/L (CAS NO - 71-43-2)	9/11/2008	< 0.5	< 0.5
	12/10/2008	**1**	**4.05**
	3/3/2009	**0.9**	**4.15**
	8/21/2009	< 0.5	**3.4**
	10/21/2009	N/A	**0.92**
	11/4/2009	**0.65**	N/A
	3/11/2010	< 0.5	**3.72**
	8/31/2010	**0.58**	**3.8**
	2/16/2011	< 0.5	**3.85**
	10/27/2011	N/A	**3.65**
	4/26/2012	< 0.5	**4.3**
	10/9/2012	< 0.5	**3.4**
	2/20/2013	N/A	**4.09**
	10/3/2013	N/A	**2.89**
	4/22/2014	N/A	2.29*
	10/14/2014	N/A	**3.89**
	5/12/2015	N/A	**2.27**
	7/29/2015	< 0.5	**2.93**
	2/15/2016	N/A	3.38*
	3/28/2016	< 0.5	N/A
	10/31/2016	< 0.5	**3.72**
	10/31/2016	< 0.5	N/A
	3/27/2017	< 0.5	**2.62**
	11/13/2017	< 0.5	4.03*
	6/6/2018	< 0.5	**2.9**
	6/6/2018	N/A	**2.86**
	11/27/2018	< 0.5	**3.06**
	3/18/2019	< 0.5	**3.04**
	12/2/2019	< 0.5	**3.24**
	12/2/2019	< 0.5	N/A
	3/30/2020	< 0.5	**2**
	11/17/2020	N/A	3.08*
	5/6/2021	< 0.5	**2.04**
	10/7/2021	< 0.5	**2.68**
	10/7/2021	N/A	**2.74**
	4/6/2022	< 0.5	**2.9**
	8/23/2022	N/A	**2.91**
	3/8/2023	N/A	**3.14**
	9/13/2023	N/A	**2.93**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Bromochloromethane, ug/L (CAS NO - 74-97-5)	9/11/2008	< 5	< 5
	12/10/2008	< 5	< 25
	3/3/2009	< 5	< 25
	8/21/2009	< 5	< 25
	10/21/2009	N/A	< 5
	11/4/2009	< 5	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 5	< 25
	2/16/2011	< 5	< 25
	10/27/2011	N/A	< 25
	4/26/2012	< 5	< 25
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 5
	10/3/2013	N/A	< 5
	4/22/2014	N/A	< 50
	10/14/2014	N/A	< 5
	5/12/2015	N/A	< 5
	7/29/2015	< 5	< 5
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	10/31/2016	< 5	< 5
	10/31/2016	< 5	N/A
	3/27/2017	< 5	< 5
	11/13/2017	< 5	< 50
	6/6/2018	< 5	< 5
	6/6/2018	N/A	< 5
	11/27/2018	< 5	< 5
	3/18/2019	< 5	< 5
	12/2/2019	< 5	< 5
	12/2/2019	< 5	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Bromodichloromethane, ug/L (CAS NO - 75-27-4)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 1.2
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Bromoform, ug/L (CAS NO - 75-25-2)	9/11/2008	< 5	< 5
	12/10/2008	< 5	< 25
	3/3/2009	< 5	< 25
	8/21/2009	< 5	< 25
	10/21/2009	N/A	< 10
	11/4/2009	< 20	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 5	< 25
	2/16/2011	< 5	< 25
	10/27/2011	N/A	< 25
	4/26/2012	< 5	< 25
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 5
	10/3/2013	N/A	< 5
	4/22/2014	N/A	< 50
	10/14/2014	N/A	< 5
	5/12/2015	N/A	< 5
	7/29/2015	< 5	< 5
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	10/31/2016	< 5	< 5
	10/31/2016	< 5	N/A
	3/27/2017	< 5	< 5
	11/13/2017	< 5	< 50
	6/6/2018	< 5	< 5
	6/6/2018	N/A	< 5
	11/27/2018	< 5	< 5
	3/18/2019	< 5	< 5
	12/2/2019	< 5	< 5
	12/2/2019	< 5	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Bromomethane, ug/L (CAS NO - 74-83-9)	9/11/2008	< 4	< 4
	12/10/2008	< 4	< 20
	3/3/2009	< 4	< 20
	8/21/2009	< 4	< 20
	10/21/2009	N/A	< 4
	11/4/2009	< 4	N/A
	3/11/2010	< 4	< 4
	8/31/2010	< 4	< 20
	2/16/2011	< 4	< 20
	10/27/2011	N/A	< 100
	4/26/2012	< 50	< 250
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 4
	10/3/2013	N/A	< 4
	4/22/2014	N/A	< 40
	10/14/2014	N/A	< 4
	5/12/2015	N/A	< 4
	7/29/2015	< 4	< 4
	2/15/2016	N/A	< 40
	3/28/2016	< 4	N/A
	10/31/2016	< 4	< 4
	10/31/2016	< 4	N/A
	3/27/2017	< 4	< 4
	11/13/2017	< 4	4.83*
	6/6/2018	< 4	< 4
	6/6/2018	N/A	< 4
	11/27/2018	< 4	< 4
	3/18/2019	< 4	< 4
	12/2/2019	< 4	< 4
	12/2/2019	< 4	N/A
	3/30/2020	< 4	< 4
	11/17/2020	N/A	< 40
	5/6/2021	< 4	< 4
	10/7/2021	< 4	< 4
	10/7/2021	N/A	< 4
	4/6/2022	< 4	< 4
	8/23/2022	N/A	< 4
	3/8/2023	N/A	< 4
	9/13/2023	N/A	< 4

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Carbon Disulfide, ug/L (CAS NO - 75-15-0)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 5
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.5
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Carbon Tetrachloride, ug/L (CAS NO - 56-23-5)	9/11/2008	< 2	< 2
	12/10/2008	< 2	< 10
	3/3/2009	< 2	< 10
	8/21/2009	< 2	< 10
	10/21/2009	N/A	< 2
	11/4/2009	< 2	N/A
	3/11/2010	< 10	< 10
	8/31/2010	< 4	< 20
	2/16/2011	< 2	< 10
	10/27/2011	N/A	< 10
	4/26/2012	< 2	< 10
	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 2.4
	10/3/2013	N/A	< 2
	4/22/2014	N/A	< 20
	10/14/2014	N/A	< 2
	5/12/2015	N/A	< 2
	7/29/2015	< 2	< 2
	2/15/2016	N/A	< 20
	3/28/2016	< 2	N/A
	10/31/2016	< 2	< 2
	10/31/2016	< 2	N/A
	3/27/2017	< 2	< 2
	11/13/2017	< 2	< 20
	6/6/2018	< 2	< 2
	6/6/2018	N/A	< 2
	11/27/2018	< 2	< 2
	3/18/2019	< 2	< 2
	12/2/2019	< 2	< 2
	12/2/2019	< 2	N/A
	3/30/2020	< 2	< 2
	11/17/2020	N/A	< 20
	5/6/2021	< 2	< 2
	10/7/2021	< 2	< 2
	10/7/2021	N/A	< 2
	4/6/2022	< 2	< 2
	8/23/2022	N/A	< 2
	3/8/2023	N/A	< 2
	9/13/2023	N/A	< 2

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chlorobenzene, ug/L (CAS NO - 108-90-7)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	**1.25**	**6.2**
	8/21/2009	< 1	**5**
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 5	**5.81**
	8/31/2010	< 1	**6.85**
	2/16/2011	< 1	**7.25**
	10/27/2011	N/A	**7.55**
	4/26/2012	< 1	**6.9**
	10/9/2012	< 1	**7.05**
	2/20/2013	N/A	**7.78**
	10/3/2013	N/A	**5.57**
	4/22/2014	N/A	< 10
	10/14/2014	N/A	**4.54**
	5/12/2015	N/A	**1.88**
	7/29/2015	0.192*	**2.83**
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	**4.59**
	10/31/2016	< 1	N/A
	3/27/2017	< 1	**2.88**
	11/13/2017	< 1	4.13*
	6/6/2018	< 1	**3.43**
	6/6/2018	N/A	**3.54**
	11/27/2018	< 1	**3.36**
	3/18/2019	< 1	**3.67**
	12/2/2019	< 1	**3.8**
	12/2/2019	< 1	N/A
	3/30/2020	< 1	**2.69**
	11/17/2020	N/A	< 10
	5/6/2021	**1.01**	**2.29**
	10/7/2021	< 1	**3.36**
	10/7/2021	N/A	**3.6**
	4/6/2022	**1.26**	**3.27**
	8/23/2022	N/A	**3.29**
	3/8/2023	N/A	**4.44**
	9/13/2023	N/A	**4.34**

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chlorodibromomethane, ug/L (CAS NO - 124-48-1)	9/11/2008	< 5	< 5
	12/10/2008	< 5	< 25
	3/3/2009	< 5	< 25
	8/21/2009	< 5	< 25
	10/21/2009	N/A	< 5
	11/4/2009	< 5	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 5	< 25
	2/16/2011	< 5	< 25
	10/27/2011	N/A	< 25
	4/26/2012	< 5	< 25
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 5
	10/3/2013	N/A	< 5
	4/22/2014	N/A	< 50
	10/14/2014	N/A	< 5
	5/12/2015	N/A	< 5
	7/29/2015	< 5	< 5
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	10/31/2016	< 5	< 5
	10/31/2016	< 5	N/A
	3/27/2017	< 5	< 5
	11/13/2017	< 5	< 50
	6/6/2018	< 5	< 5
	6/6/2018	N/A	< 5
	11/27/2018	< 5	< 5
	3/18/2019	< 5	< 5
	12/2/2019	< 5	< 5
	12/2/2019	< 5	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chloroethane, ug/L (CAS NO - 75-00-3)	9/11/2008	< 4	< 4
	12/10/2008	< 4	< 20
	3/3/2009	< 4	< 20
	8/21/2009	< 4	< 20
	10/21/2009	N/A	< 4
	11/4/2009	< 4	N/A
	3/11/2010	< 4	**4.13**
	8/31/2010	< 4	< 20
	2/16/2011	< 4	< 20
	10/27/2011	N/A	< 20
	4/26/2012	< 4	< 20
	10/9/2012	< 4	< 20
	2/20/2013	N/A	< 4
	10/3/2013	N/A	2.21*
	4/22/2014	N/A	< 40
	10/14/2014	N/A	< 4
	5/12/2015	N/A	1.52*
	7/29/2015	< 4	2.31*
	2/15/2016	N/A	< 40
	3/28/2016	< 4	N/A
	10/31/2016	< 4	1.19*
	10/31/2016	< 4	N/A
	3/27/2017	< 4	1.28*
	11/13/2017	< 4	< 40
	6/6/2018	1.28*	1.32*
	6/6/2018	N/A	1.23*
	11/27/2018	< 4	1.51*
	3/18/2019	< 4	0.857*
	12/2/2019	< 4	1.08*
	12/2/2019	< 4	N/A
	3/30/2020	< 4	0.853*
	11/17/2020	N/A	< 40
	5/6/2021	< 4	< 4
	10/7/2021	< 4	< 4
	10/7/2021	N/A	0.807*
	4/6/2022	< 4	< 4
	8/23/2022	N/A	< 4
	3/8/2023	N/A	1*
	9/13/2023	N/A	< 4

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chloroform, ug/L (CAS NO - 67-66-3)	9/11/2008	< 1	< 1
	12/10/2008	< 2.5	< 12.5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 2.8
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	6.6*
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	8.75*
	6/6/2018	< 3	< 3
	6/6/2018	N/A	< 3
	11/27/2018	< 3	< 3
	3/18/2019	< 3	< 3
	12/2/2019	< 3	< 3
	12/2/2019	< 3	N/A
	3/30/2020	< 3	< 3
	11/17/2020	N/A	< 30
	5/6/2021	< 3	< 3
	10/7/2021	< 3	< 3
	10/7/2021	N/A	< 3
	4/6/2022	< 3	< 3
	8/23/2022	N/A	< 3
	3/8/2023	N/A	< 3
	9/13/2023	N/A	< 3

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chloromethane, ug/L (CAS NO - 74-87-3)	9/11/2008	< 3	< 3
	12/10/2008	< 3	< 15
	3/3/2009	< 3	< 15
	8/21/2009	< 3	< 15
	10/21/2009	N/A	< 3
	11/4/2009	< 3	N/A
	3/11/2010	< 3	< 3
	8/31/2010	< 3	< 15
	2/16/2011	< 3	< 15
	10/27/2011	N/A	< 15
	4/26/2012	< 3	< 15
	10/9/2012	< 3	< 15
	2/20/2013	N/A	< 3.1
	10/3/2013	N/A	< 3
	4/22/2014	N/A	< 30
	10/14/2014	N/A	< 3
	5/12/2015	N/A	< 3
	7/29/2015	< 3	< 3
	2/15/2016	N/A	< 30
	3/28/2016	< 3	N/A
	10/31/2016	< 3	< 3
	10/31/2016	< 3	N/A
	3/27/2017	< 3	< 3
	11/13/2017	< 3	< 30
	6/6/2018	< 3	< 3
	6/6/2018	N/A	< 3
	11/27/2018	< 3	< 3
	3/18/2019	< 3	< 3
	12/2/2019	< 3	1.43*
	12/2/2019	< 3	N/A
	3/30/2020	< 3	< 3
	11/17/2020	N/A	< 30
	5/6/2021	< 3	< 3
	10/7/2021	< 3	< 3
	10/7/2021	N/A	< 3
	4/6/2022	< 3	< 3
	8/23/2022	N/A	< 3
	3/8/2023	N/A	< 3
	9/13/2023	N/A	< 3

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
cis-1,2-Dichloroethene, ug/L (CAS NO - 156-59-2)	9/11/2008	< 1	< 1
	12/10/2008	**3.62**	< 5
	3/3/2009	**2.79**	< 5
	8/21/2009	**1.57**	< 5
	10/21/2009	N/A	< 1
	11/4/2009	**1.48**	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.3
	10/3/2013	N/A	0.331*
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	0.258*	0.19*
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	0.339*
	10/31/2016	< 1	N/A
	3/27/2017	< 1	0.268*
	11/13/2017	0.239*	< 10
	6/6/2018	< 1	0.283*
	6/6/2018	N/A	0.26*
	11/27/2018	< 1	0.387*
	3/18/2019	< 1	0.337*
	12/2/2019	< 1	0.331*
	12/2/2019	< 1	N/A
	3/30/2020	< 1	0.266*
	11/17/2020	N/A	< 10
	5/6/2021	0.254*	0.287*
	10/7/2021	0.331*	0.267*
	10/7/2021	N/A	< 1
	4/6/2022	0.336*	0.247*
	8/23/2022	N/A	< 1
	3/8/2023	N/A	0.327*
	9/13/2023	N/A	0.406*

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
cis-1,3-Dichloropropene, ug/L (CAS NO - 10061-01-5)	9/11/2008	< 5	< 5
	12/10/2008	< 5	< 25
	3/3/2009	< 5	< 25
	8/21/2009	< 5	< 25
	10/21/2009	N/A	< 5
	11/4/2009	< 5	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 5	< 25
	2/16/2011	< 5	< 25
	10/27/2011	N/A	< 25
	4/26/2012	< 5	< 25
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 5
	10/3/2013	N/A	< 5
	4/22/2014	N/A	< 50
	10/14/2014	N/A	< 5
	5/12/2015	N/A	< 5
	7/29/2015	< 5	< 5
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	10/31/2016	< 5	< 5
	10/31/2016	< 5	N/A
	3/27/2017	< 5	< 5
	11/13/2017	< 5	< 50
	6/6/2018	< 5	< 5
	6/6/2018	N/A	< 5
	11/27/2018	< 5	< 5
	3/18/2019	< 5	< 5
	12/2/2019	< 5	< 5
	12/2/2019	< 5	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Ethylbenzene, ug/L (CAS NO - 100-41-4)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 1	**1.44**
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 2.1
	10/3/2013	N/A	0.418*
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	0.452*
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	0.332*
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Iodomethane, ug/L (CAS NO - 74-88-4)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 20	N/A
	3/11/2010	< 10	< 10
	8/31/2010	< 10	< 10
	2/16/2011	< 10	< 50
	10/27/2011	N/A	< 100
	4/26/2012	< 10	< 50
	10/9/2012	< 10	< 50
	2/20/2013	N/A	< 10
	10/3/2013	N/A	< 10
	4/22/2014	N/A	< 100
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	< 10	< 10
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	< 10	< 10
	8/23/2022	N/A	< 10
	3/8/2023	N/A	< 10
	9/13/2023	N/A	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Methylene Bromide, ug/L (CAS NO - 74-95-3)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 1	N/A
	3/11/2010	< 50	< 50
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.8
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Methylene Chloride, ug/L (CAS NO - 75-09-2)	9/11/2008	< 5	< 5
	12/10/2008	< 5	< 25
	3/3/2009	< 5	< 25
	8/21/2009	< 5	< 25
	10/21/2009	N/A	< 5
	11/4/2009	< 5	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 5	< 25
	2/16/2011	< 5	< 25
	10/27/2011	N/A	< 25
	4/26/2012	< 5	< 25
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 5
	10/3/2013	N/A	< 5
	4/22/2014	N/A	< 50
	10/14/2014	N/A	< 5
	5/12/2015	N/A	< 5
	7/29/2015	< 5	0.18*
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	10/31/2016	0.529*	0.471*
	10/31/2016	0.412*	N/A
	3/27/2017	< 5	< 5
	11/13/2017	< 5	< 50
	6/6/2018	< 5	< 5
	6/6/2018	N/A	< 5
	11/27/2018	< 5	< 5
	3/18/2019	< 5	< 5
	12/2/2019	< 5	< 5
	12/2/2019	< 5	N/A
	3/30/2020	< 10	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Styrene, ug/L (CAS NO - 100-42-5)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 2
	11/4/2009	< 2	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Tetrachloroethene, ug/L (CAS NO - 127-18-4)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.8
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Toluene, ug/L (CAS NO - 108-88-3)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.5
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	0.202*
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	**1.52**
	10/31/2016	< 1	N/A
	3/27/2017	< 1	0.526*
	11/13/2017	< 1	< 10
	6/6/2018	< 1	**1.54**
	6/6/2018	N/A	**1.5**
	11/27/2018	< 1	< 1
	3/18/2019	< 1	**1.11**
	12/2/2019	< 1	**1.81**
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	0.701*
	10/7/2021	N/A	0.599*
	4/6/2022	< 1	< 1
	8/23/2022	N/A	0.752*
	3/8/2023	N/A	0.701*
	9/13/2023	N/A	0.79*

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
trans-1,2-Dichloroethene, ug/L (CAS NO - 156-60-5)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 50	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 2.1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
trans-1,3-Dichloropropene, ug/L (CAS NO - 10061-02-6)	9/11/2008	< 5	< 5
	12/10/2008	< 5	< 25
	3/3/2009	< 5	< 25
	8/21/2009	< 5	< 25
	10/21/2009	N/A	< 5
	11/4/2009	< 5	N/A
	3/11/2010	< 5	< 5
	8/31/2010	< 5	< 25
	2/16/2011	< 5	< 25
	10/27/2011	N/A	< 25
	4/26/2012	< 5	< 25
	10/9/2012	< 5	< 25
	2/20/2013	N/A	< 5
	10/3/2013	N/A	< 5
	4/22/2014	N/A	< 50
	10/14/2014	N/A	< 5
	5/12/2015	N/A	< 5
	7/29/2015	< 5	< 5
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	10/31/2016	< 5	< 5
	10/31/2016	< 5	N/A
	3/27/2017	< 5	< 5
	11/13/2017	< 5	< 50
	6/6/2018	< 5	< 5
	6/6/2018	N/A	< 5
	11/27/2018	< 5	< 5
	3/18/2019	< 5	< 5
	12/2/2019	< 5	< 5
	12/2/2019	< 5	N/A
	3/30/2020	< 5	< 5
	11/17/2020	N/A	< 50
	5/6/2021	< 5	< 5
	10/7/2021	< 5	< 5
	10/7/2021	N/A	< 5
	4/6/2022	< 5	< 5
	8/23/2022	N/A	< 5
	3/8/2023	N/A	< 5
	9/13/2023	N/A	< 5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
trans-1,4-Dichloro-2-Butene, ug/L (CAS NO - 110-57-6)	9/11/2008	< 10	< 10
	12/10/2008	< 10	< 50
	3/3/2009	< 10	< 50
	8/21/2009	< 10	< 50
	10/21/2009	N/A	< 10
	11/4/2009	< 10	N/A
	3/11/2010	< 50	< 50
	8/31/2010	< 10	< 50
	2/16/2011	< 10	< 50
	10/27/2011	N/A	< 50
	4/26/2012	< 10	< 50
	10/9/2012	< 10	< 50
	2/20/2013	N/A	< 10
	10/3/2013	N/A	< 10
	4/22/2014	N/A	< 100
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	< 10	< 10
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	< 10	< 10
	8/23/2022	N/A	< 10
	3/8/2023	N/A	< 10
	9/13/2023	N/A	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Trichloroethene, ug/L (CAS NO - 79-01-6)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.9
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	0.317*
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Trichlorofluoromethane, ug/L (CAS NO - 75-69-4)	9/11/2008	< 4	< 4
	12/10/2008	< 4	< 20
	3/3/2009	< 4	< 20
	8/21/2009	< 4	< 20
	10/21/2009	N/A	< 4
	11/4/2009	< 4	N/A
	3/11/2010	< 4	< 4
	8/31/2010	< 4	< 20
	2/16/2011	< 4	< 20
	10/27/2011	N/A	< 20
	4/26/2012	< 4	< 20
	10/9/2012	< 4	< 20
	2/20/2013	N/A	< 4
	10/3/2013	N/A	< 4
	4/22/2014	N/A	< 40
	10/14/2014	N/A	< 4
	5/12/2015	N/A	< 4
	7/29/2015	< 4	< 4
	2/15/2016	N/A	< 40
	3/28/2016	< 4	N/A
	10/31/2016	< 4	< 4
	10/31/2016	< 4	N/A
	3/27/2017	< 4	< 4
	11/13/2017	< 4	< 40
	6/6/2018	< 4	< 4
	6/6/2018	N/A	< 4
	11/27/2018	< 4	< 4
	3/18/2019	< 4	< 4
	12/2/2019	< 4	< 4
	12/2/2019	< 4	N/A
	3/30/2020	< 4	< 4
	11/17/2020	N/A	< 40
	5/6/2021	< 4	< 4
	10/7/2021	< 4	< 4
	10/7/2021	N/A	< 4
	4/6/2022	< 4	< 4
	8/23/2022	N/A	< 4
	3/8/2023	N/A	< 4
	9/13/2023	N/A	< 4

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Vinyl Acetate, ug/L (CAS NO - 108-05-4)	9/11/2008	< 2.5	< 2.5
	12/10/2008	< 2	< 10
	3/3/2009	< 2	< 10
	8/21/2009	< 2	< 10
	10/21/2009	N/A	< 2
	11/4/2009	< 2	N/A
	3/11/2010	< 10	< 2
	8/31/2010	< 2	< 10
	2/16/2011	< 4	< 20
	10/27/2011	N/A	< 10
	4/26/2012	< 5	< 25
	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 7.4
	10/3/2013	N/A	< 2
	4/22/2014	N/A	< 20
	10/14/2014	N/A	< 10
	5/12/2015	N/A	< 10
	7/29/2015	< 10	< 10
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	10/31/2016	< 10	< 10
	10/31/2016	< 10	N/A
	3/27/2017	< 10	< 10
	11/13/2017	< 10	< 100
	6/6/2018	< 10	< 10
	6/6/2018	N/A	< 10
	11/27/2018	< 10	< 10
	3/18/2019	< 10	< 10
	12/2/2019	< 10	< 10
	12/2/2019	< 10	N/A
	3/30/2020	< 10	< 10
	11/17/2020	N/A	< 100
	5/6/2021	< 10	< 10
	10/7/2021	< 10	< 10
	10/7/2021	N/A	< 10
	4/6/2022	< 10	< 10
	8/23/2022	N/A	< 10
	3/8/2023	N/A	< 10
	9/13/2023	N/A	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Vinyl Chloride, ug/L (CAS NO - 75-01-4)	9/11/2008	< 1	< 1
	12/10/2008	< 1	< 5
	3/3/2009	< 1	< 5
	8/21/2009	< 1	< 5
	10/21/2009	N/A	< 1
	11/4/2009	< 1	N/A
	3/11/2010	< 1	< 1
	8/31/2010	< 1	< 5
	2/16/2011	< 1	< 5
	10/27/2011	N/A	< 5
	4/26/2012	< 1	< 5
	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 10
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	< 1	< 1
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	10/31/2016	< 1	< 1
	10/31/2016	< 1	N/A
	3/27/2017	< 1	< 1
	11/13/2017	< 1	< 10
	6/6/2018	< 1	< 1
	6/6/2018	N/A	< 1
	11/27/2018	< 1	< 1
	3/18/2019	< 1	< 1
	12/2/2019	< 1	< 1
	12/2/2019	< 1	N/A
	3/30/2020	< 1	< 1
	11/17/2020	N/A	< 10
	5/6/2021	< 1	< 1
	10/7/2021	< 1	< 1
	10/7/2021	N/A	< 1
	4/6/2022	< 1	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Xylenes, total, ug/L (CAS NO - 1330-20-7)	9/11/2008	< 3	< 3
	12/10/2008	< 3	< 15
	3/3/2009	< 3	< 15
	8/21/2009	< 3	< 15
	10/21/2009	N/A	< 6
	11/4/2009	< 4	N/A
	3/11/2010	< 5	< 7.5
	8/31/2010	< 3	< 15
	2/16/2011	< 3	< 15
	10/27/2011	N/A	< 15
	4/26/2012	< 3	< 15
	10/9/2012	< 3	< 15
	2/20/2013	N/A	< 3
	10/3/2013	N/A	0.376*
	4/22/2014	N/A	< 30
	10/14/2014	N/A	< 3
	5/12/2015	N/A	< 3
	7/29/2015	< 3	< 3
	2/15/2016	N/A	< 30
	3/28/2016	< 3	N/A
	10/31/2016	< 3	2.09*
	10/31/2016	< 3	N/A
	3/27/2017	< 3	0.805*
	11/13/2017	< 3	2.16*
	6/6/2018	< 3	1.14*
	6/6/2018	N/A	1.11*
	11/27/2018	< 3	0.595*
	3/18/2019	< 3	1.2*
	12/2/2019	< 3	1.23*
	12/2/2019	< 3	N/A
	3/30/2020	< 3	< 3
	11/17/2020	N/A	< 30
	5/6/2021	0.961*	1.35*
	10/7/2021	< 3	< 3
	10/7/2021	N/A	0.478*
	4/6/2022	< 3	< 3
	8/23/2022	N/A	< 3
	3/8/2023	N/A	0.551*
	9/13/2023	N/A	< 3

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Appendix I VOC Constituents	Sample Date	MW-12 DNG	MW-20 DNG
M&P-Xylene, ug/L (CAS NO - 179601-23-1)	10/9/2012	< 2	< 10
	2/20/2013	N/A	< 2
O-Xylene, ug/L (CAS NO - 95-47-6)	10/9/2012	< 1	< 5
	2/20/2013	N/A	< 1.3

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,1-Dichloropropene, ug/L (CAS NO - 563-58-6)	8/21/2009	< 1	< 5
	8/31/2010	< 1	< 5
	10/27/2011	N/A	< 5
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	5/6/2021	< 1	< 1
1,2,4,5-Tetrachlorobenzene, ug/L (CAS NO - 95-94-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
1,2,4-Trichlorobenzene, ug/L (CAS NO - 120-82-1)	8/21/2009	< 5	< 25
	8/31/2010	< 5	< 25
	10/27/2011	N/A	< 25
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	5/6/2021	< 5	< 5
1,3,5-Trinitrobenzene, ug/L (CAS NO - 99-35-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	2.11*	N/A
	5/6/2021	< 10.9	< 10.5
1,3-Dichlorobenzene, ug/L (CAS NO - 541-73-1)	8/21/2009	< 1	< 5
	8/31/2010	< 1	< 5
	10/27/2011	N/A	< 5
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	5/6/2021	< 1	< 1
1,3-Dichloropropane, ug/L (CAS NO - 142-28-9)	8/21/2009	< 1	< 5
	8/31/2010	< 1	< 5
	10/27/2011	N/A	< 5
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	5/6/2021	< 1	< 1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
1,3-Dinitrobenzene, ug/L (CAS NO - 99-65-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
1,4-Naphthoquinone, ug/L (CAS NO - 130-15-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
1,4-Phenylenediamine, ug/L (CAS NO - 106-50-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
1-Naphthylamine, ug/L (CAS NO - 134-32-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,2-Dichloropropane, ug/L (CAS NO - 594-20-7)	8/21/2009	< 4	< 20
	8/31/2010	< 4	< 20
	10/27/2011	N/A	< 20
	2/15/2016	N/A	< 40
	3/28/2016	< 4	N/A
	5/6/2021	< 4	< 4
2,3,4,6-Tetrachlorophenol, ug/L (CAS NO - 58-90-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
2,4,5-T [2C], ug/L (CAS NO - 93-76-5)	8/21/2009	< 0.2	< 0.2
	8/31/2010	< 0.53	< 0.52
	10/27/2011	N/A	< 1.1
	2/15/2016	N/A	< 5.53
	3/28/2016	< 1.16	N/A
	5/6/2021	< 1.08	**2.8**
	4/6/2022	N/A	< 1.04
	8/23/2022	N/A	< 0.6
	3/8/2023	N/A	< 0.5
	9/13/2023	N/A	< 0.994
2,4,5-TP [Silvex] [2C], ug/L (CAS NO - 93-72-1)	8/21/2009	**0.8**	**1.2**
	10/21/2009	N/A	**0.86**
	11/4/2009	< 0.2	N/A
	3/11/2010	< 0.2	< 1.1
	8/31/2010	< 0.53	< 0.52
	2/16/2011	< 0.5	< 5
	10/27/2011	N/A	< 1.1
	4/26/2012	< 1	< 1
	10/9/2012	< 0.32	< 0.29
	2/20/2013	N/A	< 1
	10/3/2013	N/A	< 1.1
	4/22/2014	N/A	< 1.01
	10/14/2014	N/A	**1.93**
	5/12/2015	N/A	< 1.08
	7/29/2015	< 1.07	< 1.08
	2/15/2016	N/A	< 5.53
	3/28/2016	< 1.16	N/A
	10/31/2016	< 1.17	< 10.5
	3/27/2017	< 1.2	< 1.24
	11/13/2017	< 1.01	< 1.07
	6/6/2018	N/A	< 1.01
	11/27/2018	N/A	< 1.09
	3/18/2019	N/A	< 1.1
	5/6/2021	< 1.08	< 1.08

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
2,4,5-Trichlorophenol, ug/L (CAS NO - 95-95-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,4,6-Trichlorophenol, ug/L (CAS NO - 88-06-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,4-D [2C], ug/L (CAS NO - 94-75-7)	8/21/2009	< 1	< 1
	8/31/2010	< 1.1	< 1
	10/27/2011	N/A	< 1.1
	2/15/2016	N/A	< 5.53
	3/28/2016	< 1.16	N/A
	5/6/2021	< 1.08	< 1.08
2,4-Dichlorophenol, ug/L (CAS NO - 120-83-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,4-Dimethylphenol, ug/L (CAS NO - 105-67-9)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	0.502*
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,4-Dinitrophenol, ug/L (CAS NO - 51-28-5)	8/21/2009	< 20	< 20
	8/31/2010	< 20	< 20
	10/27/2011	N/A	< 20
	2/15/2016	N/A	< 21.1
	3/28/2016	< 23	N/A
	5/6/2021	< 21.7	< 21.1

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
2,4-Dinitrotoluene, ug/L (CAS NO - 121-14-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,6-Dichlorophenol, ug/L (CAS NO - 87-65-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2,6-Dinitrotoluene, ug/L (CAS NO - 606-20-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Acetylaminofluorene, ug/L (CAS NO - 53-96-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Chloronaphthalene, ug/L (CAS NO - 91-58-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Chlorophenol, ug/L (CAS NO - 95-57-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
2-Methylnaphthalene, ug/L (CAS NO - 91-57-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Methylphenol, ug/L (CAS NO - 95-48-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Naphthylamine, ug/L (CAS NO - 91-59-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Nitroaniline, ug/L (CAS NO - 88-74-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
2-Nitrophenol, ug/L (CAS NO - 88-75-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
3,3-Dichlorobenzidine, ug/L (CAS NO - 91-94-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 52.6
	3/28/2016	< 57.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
3,3-Dimethylbenzidine, ug/L (CAS NO - 119-93-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
3/4-Methylphenol, ug/L (CAS NO - T-34MP)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	0.249*
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
3-Chloropropene, ug/L (CAS NO - 107-05-1)	8/21/2009	< 2	< 10
	8/31/2010	< 2	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 20
	3/28/2016	< 2	N/A
	5/6/2021	< 2	< 2
3-Methylcholanthrene, ug/L (CAS NO - 56-49-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	1.41*	N/A
	5/6/2021	< 10.9	< 10.5
3-Nitroaniline, ug/L (CAS NO - 99-09-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
4,4`-DDD, ug/L (CAS NO - 72-54-8)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	**0.034**
	2/16/2011	N/A	< 0.32
	10/27/2011	N/A	< 0.032
	4/26/2012	N/A	< 0.03
	10/9/2012	N/A	**0.0478**
	2/20/2013	N/A	< 0.032
	10/3/2013	N/A	< 0.0327
	4/22/2014	N/A	0.0024*
	10/14/2014	N/A	0.00245*
	5/12/2015	N/A	< 0.032
	7/29/2015	N/A	< 0.0327
	2/15/2016	N/A	0.0114*
	3/28/2016	0.00868*	N/A
	3/27/2017	N/A	< 0.174
	11/13/2017	N/A	0.0102*
	5/6/2021	< 0.036	< 0.0348
4,4`-DDE, ug/L (CAS NO - 72-55-9)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
4,4`-DDT, ug/L (CAS NO - 50-29-3)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	0.00459*
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
4,6-Dinitro-2-methylphenol, ug/L (CAS NO - 534-52-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
4-Aminobiphenyl, ug/L (CAS NO - 92-67-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
4-Bromophenyl phenyl ether, ug/L (CAS NO - 101-55-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
4-Chloro-3-methylphenol, ug/L (CAS NO - 59-50-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	**11**
	2/16/2011	N/A	< 10
	10/27/2011	N/A	< 10
	4/26/2012	N/A	< 10
	10/9/2012	N/A	< 10
	2/20/2013	N/A	< 10
	10/3/2013	N/A	1.95*
	4/22/2014	N/A	< 103
	10/14/2014	N/A	0.619*
	5/12/2015	N/A	0.59*
	7/29/2015	N/A	0.576*
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	10/31/2016	N/A	3.2*
	3/27/2017	N/A	< 10.2
	11/13/2017	N/A	4.03*
	5/6/2021	< 10.9	< 10.5
4-Chloroaniline, ug/L (CAS NO - 106-47-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
4-Chlorophenyl phenyl ether, ug/L (CAS NO - 7005-72-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
4-Nitroaniline, ug/L (CAS NO - 100-01-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
4-Nitrophenol, ug/L (CAS NO - 100-02-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
5-Nitro-o-toluidine, ug/L (CAS NO - 99-55-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
7,12-Dimethylbenz [a] anthracene, ug/L (CAS NO - 57-97-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Acenaphthene, ug/L (CAS NO - 83-32-9)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Acenaphthylene, ug/L (CAS NO - 208-96-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Acetonitrile, ug/L (CAS NO - 75-05-8)	8/21/2009	< 10000	< 10000
	8/31/2010	< 10000	< 10000
	10/27/2011	N/A	< 10000
	2/15/2016	N/A	< 10000
	3/28/2016	< 10000	N/A
	5/6/2021	< 10000	< 10000
Acetophenone, ug/L (CAS NO - 98-86-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	0.428*
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Acrolein, ug/L (CAS NO - 107-02-8)	8/21/2009	< 10	< 50
	8/31/2010	< 10	< 50
	10/27/2011	N/A	< 50
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	5/6/2021	< 10	< 10
Aldrin, ug/L (CAS NO - 309-00-2)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Anthracene, ug/L (CAS NO - 120-12-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	0.325*
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Benzo [a] anthracene, ug/L (CAS NO - 56-55-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Benzo [a] pyrene, ug/L (CAS NO - 50-32-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Benzo [b] fluoranthene, ug/L (CAS NO - 205-99-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Benzo [g,h,i] perylene, ug/L (CAS NO - 191-24-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Benzo [k] fluoranthene, ug/L (CAS NO - 207-08-9)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Benzyl alcohol, ug/L (CAS NO - 100-51-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Alpha-BHC, ug/L (CAS NO - 319-84-6)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Beta-BHC, ug/L (CAS NO - 319-85-7)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	0.0214*
	3/28/2016	0.0235*	N/A
	5/6/2021	< 0.036	< 0.0348
Delta-BHC, ug/L (CAS NO - 319-86-8)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	0.00386*
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Gamma-BHC [Lindane], ug/L (CAS NO - 58-89-9)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Bis[2-chloroethoxy]methane, ug/L (CAS NO - 111-91-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Bis[2-chloroethyl]ether, ug/L (CAS NO - 111-44-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Bis[2-chloroisopropyl]ether, ug/L (CAS NO - 108-60-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Bis[2-ethylhexyl]phthalate, ug/L (CAS NO - 117-81-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	2.6*
	3/28/2016	**13.9**	N/A
	10/31/2016	0.575*	N/A
	3/27/2017	< 10.4	N/A
	5/31/2017	< 10	N/A
	7/12/2017	**15.6**	N/A
	11/13/2017	< 10.4	N/A
	6/6/2018	< 106	N/A
	11/27/2018	< 10.8	N/A
	3/18/2019	< 10.6	N/A
	12/2/2019	< 10.3	N/A
	3/30/2020	< 10.8	N/A
	5/6/2021	< 10.9	< 10.5
	4/6/2022	< 10	N/A
Butyl benzyl phthalate, ug/L (CAS NO - 85-68-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Chlordane, ug/L (CAS NO - 57-74-9)	8/21/2009	< 2	< 2
	8/31/2010	< 2	< 2
	10/27/2011	N/A	< 2
	2/15/2016	N/A	< 2.08
	3/28/2016	< 8	N/A
	5/6/2021	< 2.25	< 2.17
Gamma-Chlordane, ug/L (CAS NO - 5566-34-7)	11/17/2020	N/A	< 0.0337

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Chlorobenzilate, ug/L (CAS NO - 510-15-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Chloroprene, ug/L (CAS NO - 126-99-8)	8/21/2009	< 1	< 5
	8/31/2010	< 1	< 5
	10/27/2011	N/A	< 5
	2/15/2016	N/A	< 10
	3/28/2016	< 1	N/A
	5/6/2021	< 1	< 1
Chrysene, ug/L (CAS NO - 218-01-9)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Cyanide, mg/L (CAS NO - 57-12-5)	8/21/2009	< 0.01	< 0.01
	8/31/2010	< 0.01	< 0.01
	10/27/2011	N/A	< 0.01
	2/15/2016	N/A	< 0.01
	3/28/2016	0.00387*	N/A
	5/6/2021	< 0.01	< 0.01
Diallate [cis or trans], ug/L (CAS NO - 2303-16-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Dibenz [a,h] anthracene, ug/L (CAS NO - 53-70-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Dibenzofuran, ug/L (CAS NO - 132-64-9)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Dichlorodifluoromethane, ug/L (CAS NO - 75-71-8)	8/21/2009	< 3	< 15
	8/31/2010	< 3	< 15
	10/27/2011	N/A	< 15
	2/15/2016	N/A	< 30
	3/28/2016	< 3	N/A
	5/6/2021	< 3	< 3
Dieldrin, ug/L (CAS NO - 60-57-1)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Diethyl phthalate, ug/L (CAS NO - 84-66-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	0.779*
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Dimethoate, ug/L (CAS NO - 60-51-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Dimethyl phthalate, ug/L (CAS NO - 131-11-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Dimethylaminoazobenzene, ug/L (CAS NO - 60-11-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Di-n-butyl phthalate, ug/L (CAS NO - 84-74-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	1.15*
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Di-n-octyl phthalate, ug/L (CAS NO - 117-84-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 21.1
	3/28/2016	< 23	N/A
	5/6/2021	< 21.7	< 21.1
Dinoseb, ug/L (CAS NO - 88-85-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Diphenylamine, ug/L (CAS NO - 122-39-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Disulfoton, ug/L (CAS NO - 298-04-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Endosulfan I, ug/L (CAS NO - 959-98-8)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	**0.0729**
	2/16/2011	N/A	< 0.32
	10/27/2011	N/A	**0.108**
	4/26/2012	N/A	< 0.03
	10/9/2012	N/A	**0.0449**
	2/20/2013	N/A	< 0.032
	10/3/2013	N/A	**0.0632**
	4/22/2014	N/A	**0.0707**
	10/14/2014	N/A	**0.0387**
	5/12/2015	N/A	0.0197*
	7/29/2015	N/A	< 0.0327
	2/15/2016	N/A	**0.0614**
	3/28/2016	< 0.128	N/A
	10/31/2016	N/A	**0.0538**
	3/27/2017	N/A	0.0302*
	11/13/2017	N/A	**0.0696**
	6/6/2018	N/A	0.0275*
	11/27/2018	N/A	0.0292*
	3/18/2019	N/A	0.0335*
	12/2/2019	N/A	**0.037**
	3/30/2020	N/A	0.00264*
	11/17/2020	N/A	< 0.0337
	5/6/2021	< 0.036	**0.0472**
	10/7/2021	N/A	**0.0435**
	4/6/2022	N/A	< 0.0667
	8/23/2022	N/A	< 0.064
	3/8/2023	N/A	**0.112**
	9/13/2023	N/A	< 0.064
Endosulfan II, ug/L (CAS NO - 33213-65-9)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	0.0106*	N/A
	5/6/2021	< 0.036	< 0.0348

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Endosulfan sulfate, ug/L (CAS NO - 1031-07-8)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	**0.0451**
	3/28/2016	0.0242*	N/A
	10/31/2016	N/A	0.0345*
	3/27/2017	N/A	< 0.174
	5/31/2017	N/A	0.00777*
	7/12/2017	N/A	**0.0623**
	11/13/2017	N/A	< 0.034
	6/6/2018	N/A	0.00299*
	11/27/2018	N/A	0.00595*
	3/18/2019	N/A	0.00703*
	12/2/2019	N/A	0.00968*
	3/30/2020	N/A	0.00493*
	11/17/2020	N/A	< 0.0337
	5/6/2021	< 0.036	0.0116*
	10/7/2021	N/A	< 0.0337
	4/6/2022	N/A	< 0.0667
	8/23/2022	N/A	< 0.064
Endrin, ug/L (CAS NO - 72-20-8)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	0.0103*
	3/28/2016	0.0112*	N/A
	10/31/2016	N/A	< 0.0348
	5/6/2021	< 0.036	< 0.0348
Endrin aldehyde, ug/L (CAS NO - 7421-93-4)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Ethyl Methacrylate, ug/L (CAS NO - 97-63-2)	8/21/2009	< 2	< 10
	8/31/2010	< 2	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 20
	3/28/2016	< 2	N/A
	5/6/2021	< 2	< 2

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Ethyl Methanesulfonate, ug/L (CAS NO - 62-50-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Famphur, ug/L (CAS NO - 52-85-7)	8/21/2009	< 20	< 20
	8/31/2010	< 20	< 20
	10/27/2011	N/A	< 20
	2/15/2016	N/A	< 21.1
	3/28/2016	< 23	N/A
	5/6/2021	< 10.9	< 10.5
Fluoranthene, ug/L (CAS NO - 206-44-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Fluorene, ug/L (CAS NO - 86-73-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Heptachlor, ug/L (CAS NO - 76-44-8)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	**0.162**
	3/28/2016	< 0.128	N/A
	10/31/2016	N/A	< 0.0348
	3/27/2017	N/A	0.0246*
	5/31/2017	N/A	< 0.033
	7/12/2017	N/A	< 0.034
	11/13/2017	N/A	< 0.034
	6/6/2018	N/A	< 0.0344
	11/27/2018	N/A	< 0.034
	3/18/2019	N/A	< 0.0337
	12/2/2019	N/A	< 0.0328
	3/30/2020	N/A	< 0.0364
	11/17/2020	N/A	< 0.0337
	5/6/2021	< 0.036	< 0.0348
Heptachlor Epoxide, ug/L (CAS NO - 1024-57-3)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348
Hexachlorobenzene, ug/L (CAS NO - 118-74-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Hexachlorobutadiene, ug/L (CAS NO - 87-68-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Hexachlorocyclopentadiene, ug/L (CAS NO - 77-47-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 21.1
	3/28/2016	< 23	N/A
	5/6/2021	< 10.9	< 10.5
Hexachloroethane, ug/L (CAS NO - 67-72-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Hexachloropropene, ug/L (CAS NO - 1888-71-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Indeno [1,2,3-cd] pyrene, ug/L (CAS NO - 193-39-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Isobutanol, mg/L (CAS NO - 78-83-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10
	3/28/2016	< 10	N/A
	5/6/2021	< 10	< 10
Isodrin, ug/L (CAS NO - 465-73-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Isophorone, ug/L (CAS NO - 78-59-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Isosafrole, ug/L (CAS NO - 120-58-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Kepone, ug/L (CAS NO - 143-50-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Methacrylonitrile, ug/L (CAS NO - 126-98-7)	8/21/2009	< 1	< 5
	8/31/2010	< 1	< 5
	10/27/2011	N/A	< 5
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	5/6/2021	< 10	< 10
Methapyrilene, ug/L (CAS NO - 91-80-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Methoxychlor, ug/L (CAS NO - 72-43-5)	8/21/2009	< 0.032	< 0.032
	8/31/2010	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032
	2/15/2016	N/A	< 0.0333
	3/28/2016	< 0.128	N/A
	5/6/2021	< 0.036	< 0.0348

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Methyl Methacrylate, ug/L (CAS NO - 80-62-6)	8/21/2009	< 2	< 10
	8/31/2010	< 2	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 20
	3/28/2016	< 2	N/A
	5/6/2021	< 2	< 2
Methyl Methanesulfonate, ug/L (CAS NO - 66-27-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Naphthalene, ug/L (CAS NO - 91-20-3)	8/21/2009	< 5	< 25
	8/31/2010	< 5	< 25
	10/27/2011	N/A	< 25
	2/15/2016	N/A	< 50
	3/28/2016	< 5	N/A
	5/6/2021	< 5	< 5
Nitrobenzene, ug/L (CAS NO - 98-95-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosodiethylamine, ug/L (CAS NO - 55-18-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosodimethylamine, ug/L (CAS NO - 62-75-9)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
N-Nitrosodi-n-butylamine, ug/L (CAS NO - 924-16-3)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosodi-n-propylamine, ug/L (CAS NO - 621-64-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosodiphenylamine, ug/L (CAS NO - 86-30-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosomethylethylamine, ug/L (CAS NO - 10595-95-6)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosopiperidine, ug/L (CAS NO - 100-75-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
N-Nitrosopyrrolidine, ug/L (CAS NO - 930-55-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
O,O,O-Triethyl Phosphorothioate, ug/L (CAS NO - 126-68-1)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
O-Toluidine, ug/L (CAS NO - 95-53-4)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Parathion-Ethyl, ug/L (CAS NO - 56-38-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Parathion-Methyl, ug/L (CAS NO - 298-00-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
PCB-1016, ug/L (CAS NO - 12674-11-2)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87
PCB-1221, ug/L (CAS NO - 11104-28-2)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
PCB-1232, ug/L (CAS NO - 11141-16-5)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87
PCB-1242, ug/L (CAS NO - 53469-21-9)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87
PCB-1248, ug/L (CAS NO - 12672-29-6)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87
PCB-1254, ug/L (CAS NO - 11097-69-1)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87
PCB-1260, ug/L (CAS NO - 11096-82-5)	8/21/2009	< 0.8	< 0.8
	8/31/2010	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8
	2/15/2016	N/A	< 0.87
	3/28/2016	< 0.889	N/A
	5/6/2021	< 0.899	< 0.87
Pentachlorobenzene, ug/L (CAS NO - 608-93-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Pentachloronitrobenzene, ug/L (CAS NO - 82-68-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Pentachlorophenol [2C], ug/L (CAS NO - 87-86-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	3.17*
	3/28/2016	< 11.5	N/A
	5/6/2021	2.53*	< 10.5
Phenacetin, ug/L (CAS NO - 62-44-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Phenanthrene, ug/L (CAS NO - 85-01-8)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Phenol, ug/L (CAS NO - 108-95-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Phorate, ug/L (CAS NO - 298-02-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Pronamide, ug/L (CAS NO - 23950-58-5)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Propionitrile, ug/L (CAS NO - 107-12-0)	8/21/2009	< 10	< 50
	8/31/2010	< 10	< 50
	10/27/2011	N/A	< 50
	2/15/2016	N/A	< 100
	3/28/2016	< 10	N/A
	5/6/2021	< 10	< 10
Pyrene, ug/L (CAS NO - 129-00-0)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5
Safrole, ug/L (CAS NO - 94-59-7)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Sulfide, mg/L (CAS NO - 18496-25-8)	8/21/2009	< 1	< 1
	8/31/2010	< 1	**2**
	2/16/2011	N/A	**1.1**
	10/27/2011	N/A	**3.7**
	4/26/2012	N/A	< 1
	10/9/2012	N/A	**1.8**
	2/20/2013	N/A	**4.94**
	5/15/2013	N/A	< 1
	10/3/2013	N/A	< 1
	4/22/2014	N/A	< 1
	10/14/2014	N/A	< 1
	5/12/2015	N/A	< 1
	7/29/2015	N/A	< 1
	2/15/2016	N/A	**3.26**
	3/28/2016	< 1	N/A
	10/31/2016	N/A	< 1
	3/27/2017	N/A	< 1
	11/13/2017	N/A	**4.27**
	6/6/2018	N/A	0.672*
	11/27/2018	N/A	< 1
	3/18/2019	N/A	< 1
	12/2/2019	N/A	< 1
	3/30/2020	N/A	< 1
	11/17/2020	N/A	< 10
	5/6/2021	16	12.7
	10/7/2021	< 1	< 10
	4/6/2022	N/A	< 1
	8/23/2022	N/A	< 1
	3/8/2023	N/A	< 1
	9/13/2023	N/A	< 1
Thionazin, ug/L (CAS NO - 297-97-2)	8/21/2009	< 10	< 10
	8/31/2010	< 10	< 10
	10/27/2011	N/A	< 10
	2/15/2016	N/A	< 10.5
	3/28/2016	< 11.5	N/A
	5/6/2021	< 10.9	< 10.5

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill WT - 15-SDP-01-75P - Source

Other Constituents	Sample Date	MW-12 DNG	MW-20 DNG
Toxaphene, ug/L (CAS NO - 8001-35-2)	8/21/2009	< 2	< 2
	8/31/2010	< 2	< 2
	10/27/2011	N/A	< 2
	2/15/2016	N/A	< 2.08
	3/28/2016	< 8	N/A
	5/6/2021	< 2.25	< 2.17

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

Appendix C-3

Summary of Groundwater Chemistry – Dakota Sandstone

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Antimony, mg/L (CAS NO - 7440-36-0)	2/11/2008	< 0.006	< 0.006	< 0.006	N/A
	4/30/2008	< 0.00179	< 0.00179	< 0.00179	N/A
	7/9/2008	< 0.006	< 0.006	< 0.006	N/A
	9/11/2008	< 0.006	< 0.006	< 0.006	N/A
	9/11/2008	N/A	N/A	< 0.006	N/A
	12/10/2008	< 0.006	< 0.006	< 0.006	N/A
	12/10/2008	N/A	N/A	< 0.006	N/A
	3/3/2009	N/A	< 0.006	< 0.006	N/A
	3/3/2009	N/A	N/A	< 0.006	N/A
	8/21/2009	< 0.006	< 0.006	< 0.006	< 0.006
	8/21/2009	< 0.006	N/A	N/A	N/A
	10/21/2009	N/A	< 0.006	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.006
	2/18/2010	N/A	N/A	N/A	< 0.006
	2/18/2010	N/A	N/A	N/A	< 0.006
	3/11/2010	< 0.006	< 0.006	< 0.006	< 0.006
	5/27/2010	N/A	N/A	N/A	< 0.006
	8/31/2010	< 0.006	< 0.006	< 0.006	0.00708
	8/31/2010	N/A	N/A	< 0.006	N/A
	2/16/2011	< 0.006	< 0.006	< 0.006	< 0.006
	2/16/2011	N/A	N/A	N/A	< 0.006
	7/7/2011	N/A	N/A	< 0.006	< 0.006
	10/27/2011	< 0.006	< 0.006	< 0.006	< 0.006
	4/26/2012	< 0.006	< 0.006	< 0.006	< 0.006
	4/26/2012	N/A	N/A	< 0.006	N/A
	10/9/2012	< 0.006	< 0.006	< 0.006	< 0.012
	10/9/2012	< 0.006	N/A	N/A	N/A
	2/20/2013	< 0.006	< 0.006	< 0.006	< 0.006
	2/20/2013	< 0.006	N/A	N/A	N/A
	10/3/2013	< 0.006	0.0013	< 0.006	0.00124
	10/3/2013	N/A	< 0.006	N/A	N/A
	4/22/2014	< 0.006	< 0.006	< 0.006	< 0.006
	10/14/2014	< 0.006	< 0.006	< 0.006	< 0.006
	5/12/2015	< 0.001	0.00136	0.000883	0.000197
	5/12/2015	N/A	N/A	N/A	< 0.001
	7/29/2015	0.000989*	< 0.001	0.000214*	< 0.001
	7/29/2015	N/A	N/A	0.000184*	N/A
	2/15/2016	N/A	< 0.001	0.000433*	< 0.001
	3/28/2016	0.236	N/A	N/A	N/A
	10/31/2016	**0.00213**	< 0.001	< 0.001	< 0.001
	3/27/2017	0.000202*	< 0.001	< 0.001	< 0.001
	3/27/2017	N/A	< 0.001	N/A	N/A
	11/13/2017	**0.00154**	0.000461*	0.000425*	0.000235*
	6/6/2018	**0.00651**	< 0.003	< 0.003	< 0.003
	11/26/2018	0.000446*	< 0.001	< 0.001	< 0.001
	3/18/2019	0.000549*	< 0.001	< 0.001	< 0.001
	3/18/2019	N/A	N/A	N/A	< 0.001
	12/2/2019	< 0.001	< 0.001	**0.00159**	< 0.001
	12/2/2019	N/A	N/A	**0.00166**	N/A
	3/30/2020	0.000729*	< 0.001	< 0.001	< 0.001
	3/30/2020	N/A	N/A	N/A	< 0.001
	11/17/2020	< 0.001	< 0.001	0.000548*	**0.00183**
	11/17/2020	N/A	< 0.001	N/A	N/A
	5/6/2021	< 0.002	< 0.002	< 0.002	< 0.002
	5/6/2021	N/A	N/A	< 0.002	N/A
	10/7/2021	< 0.002	< 0.002	< 0.002	< 0.002
	10/7/2021	N/A	N/A	N/A	< 0.002
	4/6/2022	0.001*	< 0.002	< 0.002	< 0.002
	4/6/2022	N/A	< 0.002	N/A	N/A
	8/23/2022	**0.00565**	< 0.002	< 0.002	< 0.002
	8/23/2022	N/A	N/A	< 0.002	N/A
	3/8/2023	0.00103*	0.000829*	< 0.002	< 0.002
	3/8/2023	N/A	N/A	N/A	< 0.002
	9/13/2023	< 0.002	< 0.002	< 0.002	< 0.002
	9/13/2023	< 0.002	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Arsenic, mg/L (CAS NO - 7440-38-2)	2/11/2008	< 0.001	0.00301	0.00404	N/A
	4/30/2008	< 0.00034	0.00543	< 0.00034	N/A
	7/9/2008	< 0.001	0.00422	0.0031	N/A
	9/11/2008	< 0.001	0.00215	0.00188	N/A
	9/11/2008	N/A	N/A	0.00188	N/A
	12/10/2008	< 0.001	0.0056	< 0.001	N/A
	12/10/2008	N/A	N/A	< 0.001	N/A
	3/3/2009	N/A	0.00388	< 0.001	N/A
	3/3/2009	N/A	N/A	0.00189	N/A
	8/21/2009	< 0.001	0.003	< 0.001	0.0066
	8/21/2009	< 0.001	N/A	N/A	N/A
	10/21/2009	N/A	0.00397	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.00763
	2/18/2010	N/A	N/A	N/A	0.00607
	2/18/2010	N/A	N/A	N/A	0.00507
	3/11/2010	< 0.001	0.00109	< 0.001	0.00211
	5/27/2010	N/A	N/A	N/A	0.0025
	8/31/2010	< 0.001	< 0.001	< 0.001	0.00329
	8/31/2010	N/A	N/A	< 0.001	N/A
	2/16/2011	< 0.001	< 0.001	< 0.001	0.00192
	2/16/2011	N/A	N/A	N/A	0.00306
	7/7/2011	N/A	N/A	< 0.001	0.00166
	10/27/2011	< 0.001	0.00388	< 0.001	< 0.001
	4/26/2012	< 0.004	0.0102	0.0044	0.138
	4/26/2012	N/A	N/A	0.0081	N/A
	10/9/2012	< 0.001	0.00354	< 0.001	0.00519
	10/9/2012	< 0.001	N/A	N/A	N/A
	2/20/2013	< 0.001	0.00412	< 0.001	0.00203
	2/20/2013	< 0.001	N/A	N/A	N/A
	10/3/2013	0.000432	0.0167	0.00122	0.00414
	10/3/2013	N/A	0.0178	N/A	N/A
	4/22/2014	0.000992	0.00713	< 0.001	0.00188
	10/14/2014	< 0.001	0.00456	< 0.001	< 0.001
	5/12/2015	< 0.002	0.00525	0.0012	0.00296
	5/12/2015	N/A	N/A	N/A	0.00251
	7/29/2015	< 0.002	**0.00338**	< 0.002	< 0.002
	7/29/2015	N/A	N/A	< 0.002	N/A
	2/15/2016	N/A	**0.00302**	< 0.002	< 0.002
	3/28/2016	0.00157*	N/A	N/A	N/A
	10/31/2016	< 0.002	**0.00314**	< 0.002	0.00119*
	3/27/2017	< 0.002	**0.0037**	< 0.002	< 0.002
	3/27/2017	N/A	**0.00369**	N/A	N/A
	11/13/2017	0.000659*	**0.00282**	< 0.002	0.000539*
	6/6/2018	**0.00135**	**0.00307**	**0.00146**	**0.00523**
	11/26/2018	0.000577*	**0.00374**	< 0.002	< 0.002
	3/18/2019	< 0.002	**0.00251**	< 0.002	0.00115*
	3/18/2019	N/A	N/A	N/A	0.00135*
	12/2/2019	< 0.002	**0.00219**	< 0.002	< 0.002
	12/2/2019	N/A	N/A	< 0.002	N/A
	3/30/2020	< 0.002	**0.00213**	< 0.002	< 0.002
	3/30/2020	N/A	N/A	N/A	< 0.002
	11/17/2020	< 0.002	**0.00401**	< 0.002	< 0.002
	11/17/2020	N/A	**0.00381**	N/A	N/A
	5/6/2021	< 0.002	**0.00283**	< 0.002	< 0.002
	5/6/2021	N/A	N/A	< 0.002	N/A
	10/7/2021	< 0.002	**0.011**	< 0.002	< 0.002
	10/7/2021	N/A	N/A	N/A	< 0.002
	4/6/2022	< 0.002	**0.00749**	< 0.002	< 0.002
	4/6/2022	N/A	**0.00757**	N/A	N/A
	8/23/2022	< 0.002	**0.0023**	< 0.002	< 0.002
	8/23/2022	N/A	N/A	< 0.002	N/A
	3/8/2023	0.00084*	**0.0135**	< 0.002	< 0.002
	3/8/2023	N/A	N/A	N/A	< 0.002
	9/13/2023	0.000921*	**0.0145**	0.000618*	0.00133*
	9/13/2023	0.000554*	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Barium, mg/L (CAS NO - 7440-39-3)	2/11/2008	0.248	0.786	0.231	N/A
	4/30/2008	0.229	0.963	0.163	N/A
	7/9/2008	0.231	0.915	0.211	N/A
	9/11/2008	0.234	0.606	0.207	N/A
	9/11/2008	N/A	N/A	0.212	N/A
	12/10/2008	0.242	0.754	0.187	N/A
	12/10/2008	N/A	N/A	0.186	N/A
	3/3/2009	N/A	1.48	0.266	N/A
	3/3/2009	N/A	N/A	0.32	N/A
	8/21/2009	0.234	0.471	0.22	2.25
	8/21/2009	0.232	N/A	N/A	N/A
	10/21/2009	N/A	0.714	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.584
	2/18/2010	N/A	N/A	N/A	0.592
	2/18/2010	N/A	N/A	N/A	0.468
	3/11/2010	0.221	0.347	0.209	0.347
	5/27/2010	N/A	N/A	N/A	0.648
	8/31/2010	0.244	0.148	0.224	3.15
	8/31/2010	N/A	N/A	0.222	N/A
	2/16/2011	0.252	0.332	0.257	1.14
	2/16/2011	N/A	N/A	N/A	0.931
	7/7/2011	N/A	N/A	0.242	0.489
	10/27/2011	0.221	0.351	0.211	0.264
	4/26/2012	0.275	0.423	0.0878	3.69
	4/26/2012	N/A	N/A	0.308	N/A
	10/9/2012	0.242	0.33	0.256	0.742
	10/9/2012	0.235	N/A	N/A	N/A
	2/20/2013	0.255	0.468	0.239	0.325
	2/20/2013	0.239	N/A	N/A	N/A
	10/3/2013	0.22	0.532	0.229	0.407
	10/3/2013	N/A	0.537	N/A	N/A
	4/22/2014	0.244	0.605	0.185	0.299
	10/14/2014	0.254	0.561	0.243	0.659
	5/12/2015	0.244	0.582	0.0629	0.922
	5/12/2015	N/A	N/A	N/A	1.1
	7/29/2015	**0.241**	**0.529**	**0.174**	**0.28**
	7/29/2015	N/A	N/A	**0.173**	N/A
	2/15/2016	N/A	**0.51**	**0.181**	**0.335**
	3/28/2016	**0.25**	N/A	N/A	N/A
	10/31/2016	**0.248**	**0.514**	**0.175**	**0.486**
	3/27/2017	**0.273**	**0.538**	**0.172**	**0.337**
	3/27/2017	N/A	**0.52**	N/A	N/A
	11/13/2017	**0.22**	**0.448**	**0.149**	**0.366**
	6/6/2018	**0.262**	**0.434**	**0.174**	**0.306**
	11/26/2018	**0.27**	**0.462**	**0.163**	**0.13**
	3/18/2019	**0.266**	**0.456**	**0.162**	**0.353**
	3/18/2019	N/A	N/A	N/A	**0.461**
	12/2/2019	**0.264**	**0.41**	**0.157**	**0.279**
	12/2/2019	N/A	N/A	**0.158**	N/A
	3/30/2020	**0.249**	**0.416**	**0.165**	**0.29**
	3/30/2020	N/A	N/A	N/A	**0.291**
	11/17/2020	**0.208**	**0.406**	**0.14**	**0.251**
	11/17/2020	N/A	**0.388**	N/A	N/A
	5/6/2021	**0.304**	**0.465**	**0.159**	**0.198**
	5/6/2021	N/A	N/A	**0.146**	N/A
	10/7/2021	**0.274**	**0.571**	**0.15**	**0.155**
	10/7/2021	N/A	N/A	N/A	**0.169**
	4/6/2022	**0.241**	**0.543**	**0.127**	**0.134**
	4/6/2022	N/A	**0.544**	N/A	N/A
	8/23/2022	**0.25**	**0.419**	**0.148**	**0.126**
	8/23/2022	N/A	N/A	**0.148**	N/A
	3/8/2023	**0.251**	**0.745**	**0.157**	**0.128**
	3/8/2023	N/A	N/A	N/A	**0.125**
	9/13/2023	**0.232**	**0.636**	**0.146**	**0.135**
	9/13/2023	**0.244**	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Beryllium, mg/L (CAS NO - 7440-41-7)	2/11/2008	< 0.001	< 0.001	< 0.001	N/A
	4/30/2008	< 0.000028	< 0.000028	< 0.000028	N/A
	7/9/2008	< 0.001	< 0.001	< 0.001	N/A
	9/11/2008	< 0.001	< 0.001	< 0.001	N/A
	9/11/2008	N/A	N/A	< 0.001	N/A
	12/10/2008	< 0.001	< 0.001	< 0.001	N/A
	12/10/2008	N/A	N/A	< 0.001	N/A
	3/3/2009	N/A	< 0.001	< 0.001	N/A
	3/3/2009	N/A	N/A	0.00644	N/A
	8/21/2009	< 0.001	< 0.001	< 0.001	0.0255
	8/21/2009	< 0.001	N/A	N/A	N/A
	10/21/2009	N/A	< 0.001	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.015
	2/18/2010	N/A	N/A	N/A	0.0176
	2/18/2010	N/A	N/A	N/A	0.0132
	3/11/2010	< 0.001	< 0.001	< 0.001	0.00297
	5/27/2010	N/A	N/A	N/A	0.00402
	8/31/2010	< 0.001	< 0.001	< 0.001	0.0309
	8/31/2010	N/A	N/A	< 0.001	N/A
	2/16/2011	< 0.001	< 0.001	0.00137	0.0111
	2/16/2011	N/A	N/A	N/A	0.00849
	7/7/2011	N/A	N/A	< 0.001	0.00467
	10/27/2011	< 0.001	< 0.001	< 0.001	< 0.001
	4/26/2012	< 0.004	< 0.004	< 0.004	0.042
	4/26/2012	N/A	N/A	< 0.004	N/A
	10/9/2012	< 0.001	< 0.001	0.00105	0.0132
	10/9/2012	< 0.001	N/A	N/A	N/A
	2/20/2013	< 0.001	< 0.001	< 0.001	0.0101
	2/20/2013	< 0.001	N/A	N/A	N/A
	10/3/2013	< 0.001	< 0.001	0.00043	0.017
	10/3/2013	N/A	< 0.001	N/A	N/A
	4/22/2014	< 0.001	< 0.001	< 0.001	0.0142
	10/14/2014	< 0.001	< 0.001	0.000756	0.00336
	5/12/2015	< 0.001	0.000066	< 0.001	0.00429
	5/12/2015	N/A	N/A	N/A	0.00689
	7/29/2015	0.000083*	< 0.001	< 0.001	**0.00129**
	7/29/2015	N/A	N/A	0.000107*	N/A
	2/15/2016	N/A	< 0.001	< 0.001	0.000455*
	3/28/2016	< 0.001	N/A	N/A	N/A
	10/31/2016	< 0.001	< 0.001	< 0.001	**0.0022**
	3/27/2017	< 0.001	< 0.001	< 0.001	0.000162*
	3/27/2017	N/A	< 0.001	N/A	N/A
	11/13/2017	< 0.001	< 0.001	< 0.001	< 0.001
	6/6/2018	< 0.001	< 0.001	< 0.001	0.000565*
	11/26/2018	< 0.001	< 0.001	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001	< 0.001	0.000867*
	3/18/2019	N/A	N/A	N/A	**0.00117**
	12/2/2019	< 0.001	< 0.001	< 0.001	< 0.001
	12/2/2019	N/A	N/A	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	< 0.001
	3/30/2020	N/A	N/A	N/A	< 0.001
	11/17/2020	< 0.001	< 0.001	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001	N/A	N/A
	5/6/2021	< 0.001	< 0.001	< 0.001	< 0.001
	5/6/2021	N/A	N/A	< 0.001	N/A
	10/7/2021	< 0.001	< 0.001	< 0.001	< 0.001
	10/7/2021	N/A	N/A	N/A	< 0.001
	4/6/2022	< 0.001	< 0.001	< 0.001	< 0.001
	4/6/2022	N/A	< 0.001	N/A	N/A
	8/23/2022	< 0.001	< 0.001	< 0.001	< 0.001
	8/23/2022	N/A	N/A	< 0.001	N/A
	3/8/2023	< 0.001	0.000338*	< 0.001	< 0.001
	3/8/2023	N/A	N/A	N/A	< 0.001
	9/13/2023	< 0.001	< 0.001	< 0.001	0.000906*
	9/13/2023	< 0.001	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Cadmium, mg/L (CAS NO - 7440-43-9)	2/11/2008	< 0.0005	0.000673	< 0.0005	N/A
	4/30/2008	0.00017	0.00263	0.00245	N/A
	7/9/2008	< 0.0005	0.00135	< 0.0005	N/A
	9/11/2008	0.00158	0.0078	0.00489	N/A
	9/11/2008	N/A	N/A	0.000803	N/A
	12/10/2008	< 0.0005	0.00294	< 0.0005	N/A
	12/10/2008	N/A	N/A	0.00216	N/A
	3/3/2009	N/A	0.00112	0.00624	N/A
	3/3/2009	N/A	N/A	< 0.0005	N/A
	8/21/2009	< 0.0005	0.00103	0.0041	0.00814
	8/21/2009	< 0.0005	N/A	N/A	N/A
	10/21/2009	N/A	0.00112	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.00408
	2/18/2010	N/A	N/A	N/A	0.00443
	2/18/2010	N/A	N/A	N/A	0.00731
	3/11/2010	< 0.0005	0.00706	< 0.0005	0.00194
	5/27/2010	N/A	N/A	N/A	0.00376
	8/31/2010	< 0.0005	0.00335	< 0.0005	0.00938
	8/31/2010	N/A	N/A	< 0.0005	N/A
	2/16/2011	< 0.0005	0.00347	0.00155	0.00676
	2/16/2011	N/A	N/A	N/A	0.0121
	7/7/2011	N/A	N/A	0.00073	0.00463
	10/27/2011	< 0.0005	0.00197	0.00758	0.00153
	4/26/2012	< 0.0008	< 0.0008	< 0.0008	0.0278
	4/26/2012	N/A	N/A	0.0019	N/A
	10/9/2012	< 0.0005	0.00111	< 0.0005	0.0062
	10/9/2012	0.000675	N/A	N/A	N/A
	2/20/2013	< 0.0005	0.000828	0.00234	0.00296
	2/20/2013	0.00125	N/A	N/A	N/A
	10/3/2013	< 0.0005	0.00067	0.000481	0.00458
	10/3/2013	N/A	0.00238	N/A	N/A
	4/22/2014	0.000507	0.000969	0.0011	0.00463
	10/14/2014	0.00014	0.000973	0.000182	0.00186
	5/12/2015	< 0.0005	0.000984	0.00284	0.004
	5/12/2015	N/A	N/A	N/A	0.00263
	7/29/2015	0.000202*	0.000257*	< 0.0005	**0.000676**
	7/29/2015	N/A	N/A	< 0.0005	N/A
	2/15/2016	N/A	< 0.0005	< 0.0005	0.000368*
	3/28/2016	0.000072*	N/A	N/A	N/A
	10/31/2016	< 0.0005	0.000036*	0.00005*	**0.000973**
	3/27/2017	< 0.0005	< 0.0005	< 0.0005	0.000095*
	3/27/2017	N/A	< 0.0005	N/A	N/A
	11/13/2017	< 0.0005	< 0.0005	0.000078*	0.000121*
	6/6/2018	< 0.0005	**0.000607**	< 0.0005	0.000428*
	11/26/2018	< 0.0005	0.000264*	< 0.0005	< 0.0005
	3/18/2019	< 0.0005	0.000081*	< 0.0005	0.000293*
	3/18/2019	N/A	N/A	N/A	0.000442*
	12/2/2019	< 0.0001	< 0.0001	0.000049*	**0.000208**
	12/2/2019	N/A	N/A	0.000041*	N/A
	3/30/2020	< 0.0001	0.00009*	< 0.0001	**0.000126**
	3/30/2020	N/A	N/A	N/A	**0.00015**
	11/17/2020	**0.000307**	0.000087*	0.000086*	< 0.0001
	11/17/2020	N/A	0.000075*	N/A	N/A
	5/6/2021	< 0.0001	< 0.0001	0.000072*	**0.000242**
	5/6/2021	N/A	N/A	0.000064*	N/A
	10/7/2021	< 0.0001	< 0.0001	< 0.0001	**0.000147**
	10/7/2021	N/A	N/A	N/A	**0.000143**
	4/6/2022	< 0.0001	< 0.0001	< 0.0001	**0.00024**
	4/6/2022	N/A	< 0.0001	N/A	N/A
	8/23/2022	< 0.0001	**0.000116**	< 0.0001	**0.000264**
	8/23/2022	N/A	N/A	< 0.0001	N/A
	3/8/2023	**0.000186**	**0.000259**	0.000073*	**0.000194**
	3/8/2023	N/A	N/A	N/A	**0.0012**
	9/13/2023	< 0.0002	**0.000213**	< 0.0002	**0.000656**
	9/13/2023	< 0.0002	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Chromium, mg/L (CAS NO - 7440-47-3)	2/11/2008	< 0.02	< 0.02	< 0.02	N/A
	4/30/2008	< 0.00173	< 0.00173	< 0.00173	N/A
	7/9/2008	< 0.02	< 0.02	< 0.02	N/A
	9/11/2008	< 0.02	< 0.02	< 0.02	N/A
	9/11/2008	N/A	N/A	< 0.02	N/A
	12/10/2008	< 0.02	< 0.02	< 0.02	N/A
	12/10/2008	N/A	N/A	< 0.02	N/A
	3/3/2009	N/A	< 0.02	< 0.02	N/A
	3/3/2009	N/A	N/A	< 0.02	N/A
	8/21/2009	< 0.02	< 0.02	< 0.02	< 0.02
	8/21/2009	< 0.02	N/A	N/A	N/A
	10/21/2009	N/A	< 0.02	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.02
	2/18/2010	N/A	N/A	N/A	< 0.02
	2/18/2010	N/A	N/A	N/A	< 0.02
	3/11/2010	< 0.02	< 0.02	< 0.02	< 0.02
	5/27/2010	N/A	N/A	N/A	< 0.02
	8/31/2010	< 0.02	< 0.02	< 0.02	< 0.02
	8/31/2010	N/A	N/A	< 0.02	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	< 0.02
	2/16/2011	N/A	N/A	N/A	< 0.02
	7/7/2011	N/A	N/A	< 0.02	< 0.02
	10/27/2011	< 0.02	< 0.02	< 0.02	< 0.02
	4/26/2012	< 0.02	< 0.02	< 0.02	0.176
	4/26/2012	N/A	N/A	< 0.02	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	< 0.02
	10/9/2012	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	< 0.02	< 0.02	< 0.02
	2/20/2013	< 0.02	N/A	N/A	N/A
	10/3/2013	< 0.02	0.00171	0.00297	0.00902
	10/3/2013	N/A	0.0024	N/A	N/A
	4/22/2014	< 0.02	< 0.02	< 0.02	0.00643
	10/14/2014	< 0.02	< 0.02	< 0.02	< 0.02
	5/12/2015	< 0.005	< 0.005	< 0.005	0.00247
	5/12/2015	N/A	N/A	N/A	0.00222
	7/29/2015	< 0.005	< 0.005	< 0.005	< 0.005
	7/29/2015	N/A	N/A	< 0.005	N/A
	2/15/2016	N/A	< 0.005	< 0.005	< 0.005
	3/28/2016	0.00065*	N/A	N/A	N/A
	10/31/2016	< 0.005	< 0.005	0.000646*	0.00161*
	3/27/2017	< 0.005	< 0.005	< 0.005	< 0.005
	3/27/2017	N/A	< 0.005	N/A	N/A
	11/13/2017	< 0.005	< 0.005	0.000777*	< 0.005
	6/6/2018	0.00323*	0.00331*	0.00402*	**0.00838**
	11/26/2018	< 0.005	< 0.005	< 0.005	< 0.005
	3/18/2019	< 0.005	< 0.005	< 0.005	0.00147*
	3/18/2019	N/A	N/A	N/A	0.00178*
	12/2/2019	< 0.005	< 0.005	< 0.005	< 0.005
	12/2/2019	N/A	N/A	< 0.005	N/A
	3/30/2020	< 0.005	< 0.005	< 0.005	< 0.005
	3/30/2020	N/A	N/A	N/A	< 0.005
	11/17/2020	< 0.005	< 0.005	< 0.005	< 0.005
	11/17/2020	N/A	< 0.005	N/A	N/A
	5/6/2021	< 0.005	< 0.005	< 0.005	< 0.005
	5/6/2021	N/A	N/A	< 0.005	N/A
	10/7/2021	< 0.005	< 0.005	< 0.005	< 0.005
	10/7/2021	N/A	N/A	N/A	< 0.005
	4/6/2022	< 0.005	< 0.005	< 0.005	< 0.005
	4/6/2022	N/A	< 0.005	N/A	N/A
	8/23/2022	< 0.005	< 0.005	< 0.005	< 0.005
	8/23/2022	N/A	N/A	< 0.005	N/A
	3/8/2023	< 0.005	< 0.005	< 0.005	0.00476*
	3/8/2023	N/A	N/A	N/A	0.00474*
	9/13/2023	< 0.005	< 0.005	< 0.005	0.00257*
	9/13/2023	< 0.005	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Cobalt, mg/L (CAS NO - 7440-48-4)	2/11/2008	< 0.02	< 0.02	< 0.02	N/A
	4/30/2008	< 0.0014	< 0.0014	< 0.0014	N/A
	7/9/2008	< 0.02	0.0204	< 0.02	N/A
	9/11/2008	< 0.02	< 0.02	< 0.02	N/A
	9/11/2008	N/A	N/A	< 0.02	N/A
	12/10/2008	< 0.02	< 0.02	< 0.02	N/A
	12/10/2008	N/A	N/A	< 0.02	N/A
	3/3/2009	N/A	0.0361	< 0.02	N/A
	3/3/2009	N/A	N/A	< 0.02	N/A
	8/21/2009	< 0.02	< 0.02	< 0.02	0.332
	8/21/2009	< 0.02	N/A	N/A	N/A
	10/21/2009	N/A	< 0.02	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.0972
	2/18/2010	N/A	N/A	N/A	0.0874
	2/18/2010	N/A	N/A	N/A	0.105
	3/11/2010	< 0.00155	0.0172	0.00252	0.035
	5/27/2010	N/A	N/A	N/A	0.0651
	8/31/2010	< 0.00155	0.00507	0.00285	0.164
	8/31/2010	N/A	N/A	0.00596	N/A
	2/16/2011	< 0.00155	0.0253	0.00449	0.0371
	2/16/2011	N/A	N/A	N/A	0.0538
	7/7/2011	N/A	N/A	0.00484	0.078
	10/27/2011	0.00173	0.0478	0.0025	0.0108
	4/26/2012	< 0.001	0.0424	< 0.001	0.652
	4/26/2012	N/A	N/A	0.0136	N/A
	10/9/2012	< 0.00155	0.0315	0.00239	0.031
	10/9/2012	< 0.00155	N/A	N/A	N/A
	2/20/2013	< 0.00132	0.0674	0.0015	0.0413
	2/20/2013	< 0.00132	N/A	N/A	N/A
	10/3/2013	< 0.00132	0.0616	0.00342	0.0702
	10/3/2013	N/A	0.0601	N/A	N/A
	4/22/2014	< 0.00241	0.0711	< 0.00241	0.0472
	10/14/2014	< 0.00241	0.0441	0.00385	0.0675
	5/12/2015	0.000122	0.0545	0.000065	0.0961
	5/12/2015	N/A	N/A	N/A	0.088
	7/29/2015	0.00008*	**0.0209**	0.000206*	**0.00671**
	7/29/2015	N/A	N/A	**0.000506**	N/A
	2/15/2016	N/A	**0.0176**	0.000311*	**0.00422**
	3/28/2016	0.000293*	N/A	N/A	N/A
	10/31/2016	< 0.0005	**0.00837**	0.000088*	**0.00953**
	3/27/2017	< 0.0005	**0.00886**	< 0.0005	**0.0014**
	3/27/2017	N/A	**0.00857**	N/A	N/A
	11/13/2017	< 0.0005	**0.00564**	0.00005*	**0.00114**
	6/6/2018	< 0.001	**0.00551**	< 0.001	**0.00821**
	11/26/2018	< 0.0005	**0.00458**	< 0.0005	0.000208*
	3/18/2019	< 0.0005	**0.0041**	< 0.0005	**0.0104**
	3/18/2019	N/A	N/A	N/A	**0.0174**
	12/2/2019	< 0.0005	**0.00354**	0.000105*	**0.00385**
	12/2/2019	N/A	N/A	0.00013*	N/A
	3/30/2020	< 0.0005	**0.00329**	< 0.0005	**0.000725**
	3/30/2020	N/A	N/A	N/A	**0.000707**
	11/17/2020	**0.00138**	**0.0101**	0.00047*	< 0.0005
	11/17/2020	N/A	**0.00975**	N/A	N/A
	5/6/2021	< 0.0005	**0.00932**	0.000175*	**0.00133**
	5/6/2021	N/A	N/A	0.000168*	N/A
	10/7/2021	< 0.0005	**0.0148**	< 0.0005	**0.0012**
	10/7/2021	N/A	N/A	N/A	**0.00112**
	4/6/2022	< 0.0005	**0.0107**	< 0.0005	**0.00231**
	4/6/2022	N/A	**0.0107**	N/A	N/A
	8/23/2022	< 0.0005	**0.00619**	< 0.0005	**0.00253**
	8/23/2022	N/A	N/A	< 0.0005	N/A
	3/8/2023	0.000197*	**0.0134**	< 0.0005	**0.00161**
	3/8/2023	N/A	N/A	N/A	**0.00156**
	9/13/2023	< 0.0005	**0.0113**	< 0.0005	**0.00387**
	9/13/2023	< 0.0005	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Copper, mg/L (CAS NO - 7440-50-8)	2/11/2008	< 0.02	< 0.02	< 0.02	N/A
	4/30/2008	< 0.0131	0.0201	< 0.0131	N/A
	7/9/2008	< 0.02	0.0283	< 0.02	N/A
	9/11/2008	< 0.02	< 0.02	< 0.02	N/A
	9/11/2008	N/A	N/A	< 0.02	N/A
	12/10/2008	< 0.02	< 0.02	< 0.02	N/A
	12/10/2008	N/A	N/A	< 0.02	N/A
	3/3/2009	N/A	0.0208	< 0.02	N/A
	3/3/2009	N/A	N/A	< 0.02	N/A
	8/21/2009	< 0.02	< 0.02	< 0.02	0.0509
	8/21/2009	< 0.02	N/A	N/A	N/A
	10/21/2009	N/A	< 0.02	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.0306
	2/18/2010	N/A	N/A	N/A	0.0344
	2/18/2010	N/A	N/A	N/A	0.0362
	3/11/2010	< 0.02	< 0.02	< 0.02	< 0.02
	5/27/2010	N/A	N/A	N/A	< 0.02
	8/31/2010	< 0.02	< 0.02	< 0.02	0.0478
	8/31/2010	N/A	N/A	< 0.02	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	0.0239
	2/16/2011	N/A	N/A	N/A	0.0292
	7/7/2011	N/A	N/A	< 0.02	0.021
	10/27/2011	< 0.02	< 0.02	< 0.02	< 0.02
	4/26/2012	< 0.02	< 0.02	< 0.02	0.3
	4/26/2012	N/A	N/A	< 0.02	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	0.0262
	10/9/2012	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	< 0.02	< 0.02	0.0235
	2/20/2013	< 0.02	N/A	N/A	N/A
	10/3/2013	< 0.02	< 0.02	0.00292	0.0267
	10/3/2013	N/A	< 0.02	N/A	N/A
	4/22/2014	< 0.02	< 0.02	< 0.02	0.0246
	10/14/2014	< 0.02	< 0.02	0.00377	0.012
	5/12/2015	< 0.002	0.00262	0.00282	0.0233
	5/12/2015	N/A	N/A	N/A	0.0184
	7/29/2015	**0.0164**	< 0.002	< 0.002	**0.00538**
	7/29/2015	N/A	N/A	0.00105*	N/A
	2/15/2016	N/A	< 0.002	0.000616*	**0.00305**
	3/28/2016	0.00415*	N/A	N/A	N/A
	10/31/2016	< 0.005	< 0.005	< 0.005	0.00388*
	3/27/2017	< 0.005	< 0.005	< 0.005	< 0.005
	3/27/2017	N/A	< 0.005	N/A	N/A
	11/13/2017	< 0.005	< 0.005	< 0.005	< 0.005
	6/6/2018	0.00199*	0.00163*	0.00176*	**0.00611**
	11/26/2018	< 0.005	< 0.005	< 0.005	< 0.005
	3/18/2019	< 0.005	< 0.005	< 0.005	0.0022*
	3/18/2019	N/A	N/A	N/A	0.00361*
	12/2/2019	< 0.005	< 0.005	< 0.005	< 0.005
	12/2/2019	N/A	N/A	< 0.005	N/A
	3/30/2020	< 0.005	< 0.005	< 0.005	< 0.005
	3/30/2020	N/A	N/A	N/A	< 0.005
	11/17/2020	< 0.005	< 0.005	< 0.005	< 0.005
	11/17/2020	N/A	< 0.005	N/A	N/A
	5/6/2021	< 0.005	< 0.005	< 0.005	< 0.005
	5/6/2021	N/A	N/A	< 0.005	N/A
	10/7/2021	< 0.005	< 0.005	< 0.005	< 0.005
	10/7/2021	N/A	N/A	N/A	< 0.005
	4/6/2022	< 0.005	< 0.005	< 0.005	< 0.005
	4/6/2022	N/A	< 0.005	N/A	N/A
	8/23/2022	< 0.005	0.00201*	< 0.005	**0.00878**
	8/23/2022	N/A	N/A	< 0.005	N/A
	3/8/2023	< 0.005	< 0.005	< 0.005	< 0.005
	3/8/2023	N/A	N/A	N/A	< 0.005
	9/13/2023	< 0.005	0.00181*	< 0.005	0.00388*
	9/13/2023	< 0.005	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Lead, mg/L (CAS NO - 7439-92-1)	2/11/2008	< 0.004	< 0.004	0.00506	N/A
	4/30/2008	< 0.00037	0.00742	< 0.00037	N/A
	7/9/2008	< 0.004	0.00472	< 0.004	N/A
	9/11/2008	< 0.004	< 0.004	< 0.004	N/A
	9/11/2008	N/A	N/A	< 0.004	N/A
	12/10/2008	< 0.004	< 0.004	< 0.004	N/A
	12/10/2008	N/A	N/A	< 0.004	N/A
	3/3/2009	N/A	0.00514	0.0048	N/A
	3/3/2009	N/A	N/A	< 0.004	N/A
	8/21/2009	< 0.004	< 0.004	< 0.004	0.00494
	8/21/2009	< 0.004	N/A	N/A	N/A
	10/21/2009	N/A	< 0.004	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.0266
	2/18/2010	N/A	N/A	N/A	0.0232
	2/18/2010	N/A	N/A	N/A	0.0292
	3/11/2010	< 0.004	0.00464	< 0.004	0.0243
	5/27/2010	N/A	N/A	N/A	0.0203
	8/31/2010	< 0.004	< 0.004	< 0.004	0.0271
	8/31/2010	N/A	N/A	< 0.004	N/A
	2/16/2011	< 0.004	< 0.004	< 0.004	0.0115
	2/16/2011	N/A	N/A	N/A	0.0143
	7/7/2011	N/A	N/A	< 0.004	0.0189
	10/27/2011	< 0.004	0.00468	< 0.004	0.011
	4/26/2012	< 0.004	< 0.004	0.0099	0.411
	4/26/2012	N/A	N/A	< 0.004	N/A
	10/9/2012	< 0.004	< 0.004	< 0.004	0.0136
	10/9/2012	< 0.004	N/A	N/A	N/A
	2/20/2013	< 0.004	< 0.004	< 0.004	0.0162
	2/20/2013	< 0.004	N/A	N/A	N/A
	10/3/2013	< 0.004	< 0.004	< 0.004	0.0178
	10/3/2013	N/A	0.00116	N/A	N/A
	4/22/2014	< 0.004	0.00121	< 0.004	0.0158
	10/14/2014	< 0.004	< 0.004	0.00264	0.0375
	5/12/2015	0.000147	0.000832	0.000489	0.0292
	5/12/2015	N/A	N/A	N/A	0.0369
	7/29/2015	< 0.0005	0.000195*	0.000165*	**0.00671**
	7/29/2015	N/A	N/A	**0.000697**	N/A
	2/15/2016	N/A	< 0.0005	0.000449*	**0.00426**
	3/28/2016	**0.000765**	N/A	N/A	N/A
	10/31/2016	< 0.0005	< 0.0005	< 0.0005	**0.00886**
	3/27/2017	< 0.0005	< 0.0005	< 0.0005	**0.00209**
	3/27/2017	N/A	< 0.0005	N/A	N/A
	11/13/2017	< 0.0005	< 0.0005	0.000409*	**0.00154**
	6/6/2018	0.00037*	0.000414*	0.000235*	**0.00655**
	11/26/2018	< 0.0005	0.000348*	< 0.0005	0.000306*
	3/18/2019	< 0.0005	< 0.0005	< 0.0005	**0.0068**
	3/18/2019	N/A	N/A	N/A	**0.00821**
	12/2/2019	< 0.0005	< 0.0005	< 0.0005	**0.00361**
	12/2/2019	N/A	N/A	< 0.0005	N/A
	3/30/2020	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	3/30/2020	N/A	N/A	N/A	< 0.0005
	11/17/2020	0.000339*	< 0.0005	0.000455*	0.000233*
	11/17/2020	N/A	< 0.0005	N/A	N/A
	5/6/2021	< 0.0005	< 0.0005	0.000269*	< 0.0005
	5/6/2021	N/A	N/A	< 0.0005	N/A
	10/7/2021	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	10/7/2021	N/A	N/A	N/A	< 0.0005
	4/6/2022	< 0.0005	< 0.0005	< 0.0005	0.000457*
	4/6/2022	N/A	< 0.0005	N/A	N/A
	8/23/2022	**0.000528**	< 0.0005	< 0.0005	< 0.0005
	8/23/2022	N/A	N/A	< 0.0005	N/A
	3/8/2023	0.000369*	**0.000534**	< 0.0005	< 0.0005
	3/8/2023	N/A	N/A	N/A	0.000272*
	9/13/2023	< 0.0005	**0.000589**	< 0.0005	**0.00215**
	9/13/2023	< 0.0005	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Mercury, mg/L (CAS NO - 7439-97-6)	8/21/2009	N/A	< 0.0002	N/A	N/A
	8/31/2010	N/A	< 0.0002	N/A	N/A
	7/7/2011	N/A	N/A	< 0.0002	< 0.0002
	10/27/2011	N/A	< 0.0002	N/A	N/A
	10/9/2012	N/A	N/A	< 0.000267	< 0.000267
	2/15/2016	N/A	< 0.0002	N/A	N/A
	3/27/2017	N/A	N/A	< 0.0002	< 0.0002
	5/6/2021	N/A	< 0.0002	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0002	< 0.0002

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Nickel, mg/L (CAS NO - 7440-02-0)	2/11/2008	< 0.05	< 0.05	< 0.05	N/A
	4/30/2008	< 0.0046	< 0.0046	< 0.0046	N/A
	7/9/2008	< 0.05	< 0.05	< 0.05	N/A
	9/11/2008	< 0.05	< 0.05	< 0.05	N/A
	9/11/2008	N/A	N/A	< 0.05	N/A
	12/10/2008	< 0.05	< 0.05	< 0.05	N/A
	12/10/2008	N/A	N/A	< 0.05	N/A
	3/3/2009	N/A	0.0822	< 0.05	N/A
	3/3/2009	N/A	N/A	< 0.05	N/A
	8/21/2009	< 0.05	< 0.05	< 0.05	0.199
	8/21/2009	< 0.05	N/A	N/A	N/A
	10/21/2009	N/A	< 0.05	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.0781
	2/18/2010	N/A	N/A	N/A	0.0808
	2/18/2010	N/A	N/A	N/A	0.11
	3/11/2010	< 0.05	< 0.05	< 0.05	< 0.05
	5/27/2010	N/A	N/A	N/A	0.0527
	8/31/2010	< 0.05	< 0.05	< 0.05	0.188
	8/31/2010	N/A	N/A	< 0.05	N/A
	2/16/2011	< 0.05	< 0.05	< 0.05	0.0623
	2/16/2011	N/A	N/A	N/A	0.0836
	7/7/2011	N/A	N/A	< 0.05	0.0775
	10/27/2011	< 0.05	< 0.05	< 0.05	< 0.05
	4/26/2012	< 0.05	0.0624	< 0.05	0.744
	4/26/2012	N/A	N/A	< 0.05	N/A
	10/9/2012	< 0.05	< 0.05	< 0.05	0.0547
	10/9/2012	< 0.05	N/A	N/A	N/A
	2/20/2013	< 0.05	0.0602	< 0.05	0.0688
	2/20/2013	< 0.05	N/A	N/A	N/A
	5/15/2013	N/A	0.0546	N/A	N/A
	10/3/2013	< 0.05	0.0648	0.00734	0.0712
	10/3/2013	N/A	0.0669	N/A	N/A
	4/22/2014	< 0.05	0.0688	< 0.05	0.0586
	10/14/2014	< 0.05	0.054	0.00967	0.049
	5/12/2015	< 0.005	0.0423	< 0.005	0.0529
	5/12/2015	N/A	N/A	N/A	0.0723
	7/29/2015	< 0.005	**0.0242**	< 0.005	**0.00943**
	7/29/2015	N/A	N/A	0.000867*	N/A
	2/15/2016	N/A	**0.0201**	0.00063*	**0.00639**
	3/28/2016	< 0.005	N/A	N/A	N/A
	10/31/2016	< 0.005	**0.011**	< 0.005	**0.0225**
	3/27/2017	< 0.005	**0.012**	< 0.005	0.00179*
	3/27/2017	N/A	**0.0116**	N/A	N/A
	11/13/2017	< 0.005	**0.00682**	< 0.005	0.00201*
	6/6/2018	0.00065*	**0.00874**	0.000786*	**0.0107**
	11/26/2018	< 0.005	**0.00735**	< 0.005	< 0.005
	3/18/2019	< 0.005	**0.00557**	< 0.005	0.00301*
	3/18/2019	N/A	N/A	N/A	**0.0052**
	12/2/2019	< 0.005	**0.00537**	< 0.005	0.00284*
	12/2/2019	N/A	N/A	< 0.005	N/A
	3/30/2020	< 0.005	0.00366*	< 0.005	0.00236*
	3/30/2020	N/A	N/A	N/A	0.00234*
	11/17/2020	0.00447*	**0.00809**	< 0.005	< 0.005
	11/17/2020	N/A	**0.00826**	N/A	N/A
	5/6/2021	< 0.005	**0.00883**	< 0.005	0.00415*
	5/6/2021	N/A	N/A	< 0.005	N/A
	10/7/2021	< 0.005	**0.0164**	< 0.005	0.00479*
	10/7/2021	N/A	N/A	N/A	0.00421*
	4/6/2022	< 0.005	**0.0143**	< 0.005	**0.00633**
	4/6/2022	N/A	**0.015**	N/A	N/A
	8/23/2022	< 0.005	**0.00744**	< 0.005	**0.00535**
	8/23/2022	N/A	N/A	< 0.005	N/A
	3/8/2023	< 0.005	**0.0188**	< 0.005	**0.00796**
	3/8/2023	N/A	N/A	N/A	**0.00818**
	9/13/2023	< 0.005	**0.0142**	< 0.005	**0.0183**
	9/13/2023	**0.0165**	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Selenium, mg/L (CAS NO - 7782-49-2)	2/11/2008	< 0.005	0.00672	< 0.005	N/A
	4/30/2008	< 0.00144	< 0.00144	< 0.00144	N/A
	7/9/2008	< 0.005	< 0.005	0.00621	N/A
	9/11/2008	< 0.005	< 0.005	0.00902	N/A
	9/11/2008	N/A	N/A	0.00923	N/A
	12/10/2008	< 0.005	< 0.005	0.00796	N/A
	12/10/2008	N/A	N/A	0.00789	N/A
	3/3/2009	N/A	< 0.005	0.00679	N/A
	3/3/2009	N/A	N/A	0.00514	N/A
	8/21/2009	< 0.005	< 0.005	0.0128	< 0.005
	8/21/2009	< 0.005	N/A	N/A	N/A
	10/21/2009	N/A	< 0.005	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.00544
	2/18/2010	N/A	N/A	N/A	< 0.005
	2/18/2010	N/A	N/A	N/A	< 0.005
	3/11/2010	< 0.005	< 0.005	0.00911	< 0.005
	5/27/2010	N/A	N/A	N/A	< 0.005
	8/31/2010	< 0.005	< 0.005	0.00968	< 0.005
	8/31/2010	N/A	N/A	0.00931	N/A
	2/16/2011	< 0.005	< 0.005	0.00726	< 0.005
	2/16/2011	N/A	N/A	N/A	< 0.005
	7/7/2011	N/A	N/A	0.00764	< 0.005
	10/27/2011	< 0.005	< 0.006	0.00733	< 0.005
	4/26/2012	< 0.005	< 0.005	0.0831	0.0132
	4/26/2012	N/A	N/A	0.0061	N/A
	10/9/2012	< 0.005	< 0.005	< 0.005	0.00541
	10/9/2012	< 0.005	N/A	N/A	N/A
	2/20/2013	< 0.005	< 0.005	< 0.005	< 0.005
	2/20/2013	< 0.005	N/A	N/A	N/A
	10/3/2013	< 0.005	< 0.005	0.00353	0.00517
	10/3/2013	N/A	< 0.005	N/A	N/A
	4/22/2014	< 0.005	< 0.005	0.000691	0.000574
	10/14/2014	< 0.005	< 0.005	0.00127	< 0.005
	5/12/2015	< 0.005	< 0.005	< 0.005	< 0.005
	5/12/2015	N/A	N/A	N/A	< 0.005
	7/29/2015	< 0.005	< 0.005	< 0.005	< 0.005
	7/29/2015	N/A	N/A	< 0.005	N/A
	2/15/2016	N/A	< 0.005	< 0.005	< 0.005
	3/28/2016	0.00142*	N/A	N/A	N/A
	10/31/2016	0.000798*	< 0.005	0.00192*	0.00241*
	3/27/2017	0.00155*	< 0.005	0.00229*	0.00279*
	3/27/2017	N/A	< 0.005	N/A	N/A
	11/13/2017	0.00124*	< 0.005	0.00218*	0.00206*
	6/6/2018	< 0.0025	< 0.0025	0.00229*	**0.00326**
	11/26/2018	0.00156*	< 0.005	0.00209*	0.00109*
	3/18/2019	0.00145*	< 0.005	0.0018*	0.00175*
	3/18/2019	N/A	N/A	N/A	0.00202*
	12/2/2019	0.00148*	< 0.005	0.00167*	0.00156*
	12/2/2019	N/A	N/A	0.00197*	N/A
	3/30/2020	0.00149*	< 0.005	0.00229*	0.00213*
	3/30/2020	N/A	N/A	N/A	0.00232*
	11/17/2020	0.00216*	< 0.005	0.00113*	0.00134*
	11/17/2020	N/A	< 0.005	N/A	N/A
	5/6/2021	0.00102*	< 0.005	0.00174*	0.00217*
	5/6/2021	N/A	N/A	0.00177*	N/A
	10/7/2021	0.00152*	< 0.005	0.00171*	0.00206*
	10/7/2021	N/A	N/A	N/A	0.00247*
	4/6/2022	0.00169*	< 0.005	0.0016*	0.00195*
	4/6/2022	N/A	< 0.005	N/A	N/A
	8/23/2022	< 0.005	< 0.005	< 0.005	0.00131*
	8/23/2022	N/A	N/A	< 0.005	N/A
	3/8/2023	0.00205*	0.00135*	0.00209*	0.0023*
	3/8/2023	N/A	N/A	N/A	0.00174*
	9/13/2023	0.00149*	0.0017*	0.00219*	0.00199*
	9/13/2023	< 0.005	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Silver, mg/L (CAS NO - 7440-22-4)	2/11/2008	< 0.02	< 0.02	< 0.02	N/A
	4/30/2008	< 0.00261	< 0.00261	< 0.00261	N/A
	7/9/2008	< 0.02	< 0.02	< 0.02	N/A
	9/11/2008	< 0.02	< 0.02	< 0.02	N/A
	9/11/2008	N/A	N/A	< 0.02	N/A
	12/10/2008	< 0.02	< 0.02	< 0.02	N/A
	12/10/2008	N/A	N/A	< 0.02	N/A
	3/3/2009	N/A	< 0.02	< 0.02	N/A
	3/3/2009	N/A	N/A	< 0.02	N/A
	8/21/2009	< 0.02	< 0.02	< 0.02	< 0.02
	8/21/2009	< 0.02	N/A	N/A	N/A
	10/21/2009	N/A	< 0.02	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.02
	2/18/2010	N/A	N/A	N/A	< 0.02
	2/18/2010	N/A	N/A	N/A	< 0.02
	3/11/2010	< 0.02	< 0.02	< 0.02	< 0.02
	5/27/2010	N/A	N/A	N/A	< 0.02
	8/31/2010	< 0.02	< 0.02	< 0.02	< 0.02
	8/31/2010	N/A	N/A	< 0.02	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	< 0.02
	2/16/2011	N/A	N/A	N/A	< 0.02
	7/7/2011	N/A	N/A	< 0.02	< 0.02
	10/27/2011	< 0.02	< 0.02	< 0.02	< 0.02
	4/26/2012	< 0.02	< 0.02	< 0.02	< 0.02
	4/26/2012	N/A	N/A	< 0.02	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	< 0.02
	10/9/2012	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	< 0.02	< 0.02	< 0.02
	2/20/2013	< 0.02	N/A	N/A	N/A
	10/3/2013	< 0.02	< 0.02	< 0.02	< 0.02
	10/3/2013	N/A	< 0.02	N/A	N/A
	4/22/2014	< 0.02	< 0.02	< 0.02	< 0.02
	10/14/2014	< 0.02	< 0.02	< 0.02	< 0.02
	5/12/2015	< 0.001	0.000069	< 0.001	0.000081
	5/12/2015	N/A	N/A	N/A	0.000079
	7/29/2015	< 0.001	< 0.001	< 0.001	< 0.001
	7/29/2015	N/A	N/A	< 0.001	N/A
	2/15/2016	N/A	< 0.001	< 0.001	< 0.001
	3/28/2016	0.000156*	N/A	N/A	N/A
	10/31/2016	< 0.001	< 0.001	< 0.001	< 0.001
	3/27/2017	< 0.001	< 0.001	< 0.001	< 0.001
	3/27/2017	N/A	< 0.001	N/A	N/A
	11/13/2017	< 0.001	< 0.001	< 0.001	< 0.001
	6/6/2018	< 0.0005	< 0.0005	< 0.0005	< 0.0005
	11/26/2018	< 0.001	< 0.001	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001	< 0.001	< 0.001
	3/18/2019	N/A	N/A	N/A	< 0.001
	12/2/2019	< 0.001	< 0.001	< 0.001	< 0.001
	12/2/2019	N/A	N/A	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	< 0.001
	3/30/2020	N/A	N/A	N/A	< 0.001
	11/17/2020	< 0.001	< 0.001	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001	N/A	N/A
	5/6/2021	< 0.001	< 0.001	< 0.001	< 0.001
	5/6/2021	N/A	N/A	< 0.001	N/A
	10/7/2021	< 0.001	< 0.001	< 0.001	< 0.001
	10/7/2021	N/A	N/A	N/A	< 0.001
	4/6/2022	0.000651*	< 0.001	< 0.001	< 0.001
	4/6/2022	N/A	< 0.001	N/A	N/A
	8/23/2022	< 0.001	< 0.001	< 0.001	< 0.001
	8/23/2022	N/A	N/A	< 0.001	N/A
	3/8/2023	< 0.001	< 0.001	< 0.001	< 0.001
	3/8/2023	N/A	N/A	N/A	< 0.001
	9/13/2023	< 0.001	**0.00111**	< 0.001	< 0.001
	9/13/2023	< 0.001	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Thallium, mg/L (CAS NO - 7440-28-0)	2/11/2008	< 0.002	< 0.002	< 0.002	N/A
	4/30/2008	< 0.0007	< 0.0007	< 0.0007	N/A
	7/9/2008	< 0.002	< 0.002	< 0.002	N/A
	9/11/2008	< 0.002	< 0.002	< 0.002	N/A
	9/11/2008	N/A	N/A	< 0.002	N/A
	12/10/2008	< 0.002	< 0.002	< 0.002	N/A
	12/10/2008	N/A	N/A	< 0.002	N/A
	3/3/2009	N/A	< 0.002	< 0.002	N/A
	3/3/2009	N/A	N/A	< 0.002	N/A
	8/21/2009	< 0.002	< 0.002	< 0.002	< 0.002
	8/21/2009	< 0.002	N/A	N/A	N/A
	10/21/2009	N/A	< 0.002	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.002
	2/18/2010	N/A	N/A	N/A	< 0.002
	2/18/2010	N/A	N/A	N/A	< 0.002
	3/11/2010	< 0.002	< 0.002	< 0.002	< 0.002
	5/27/2010	N/A	N/A	N/A	< 0.002
	8/31/2010	< 0.002	< 0.002	< 0.002	< 0.002
	8/31/2010	N/A	N/A	< 0.002	N/A
	2/16/2011	< 0.002	< 0.002	< 0.002	< 0.002
	2/16/2011	N/A	N/A	N/A	< 0.002
	7/7/2011	N/A	N/A	< 0.002	< 0.002
	10/27/2011	< 0.002	< 0.002	< 0.002	< 0.002
	4/26/2012	< 0.002	0.002	< 0.002	0.0034
	4/26/2012	N/A	N/A	< 0.002	N/A
	10/9/2012	< 0.002	< 0.002	< 0.002	< 0.002
	10/9/2012	< 0.002	N/A	N/A	N/A
	2/20/2013	< 0.002	< 0.002	< 0.002	< 0.002
	2/20/2013	< 0.002	N/A	N/A	N/A
	10/3/2013	< 0.002	< 0.002	< 0.002	< 0.002
	10/3/2013	N/A	< 0.002	N/A	N/A
	4/22/2014	< 0.002	< 0.002	< 0.002	< 0.002
	10/14/2014	< 0.002	< 0.002	< 0.002	< 0.002
	5/12/2015	< 0.001	0.000233	< 0.001	0.000042
	5/12/2015	N/A	N/A	N/A	0.000036
	7/29/2015	< 0.001	0.000108*	< 0.001	< 0.001
	7/29/2015	N/A	N/A	< 0.001	N/A
	2/15/2016	N/A	0.000073*	< 0.001	< 0.001
	3/28/2016	< 0.001	N/A	N/A	N/A
	10/31/2016	< 0.001	0.000052*	< 0.001	< 0.001
	3/27/2017	< 0.001	< 0.001	< 0.001	< 0.001
	3/27/2017	N/A	0.000078*	N/A	N/A
	11/13/2017	< 0.001	< 0.001	< 0.001	< 0.001
	6/6/2018	< 0.002	< 0.002	< 0.002	< 0.002
	11/26/2018	< 0.001	< 0.001	< 0.001	< 0.001
	3/18/2019	< 0.001	< 0.001	< 0.001	< 0.001
	3/18/2019	N/A	N/A	N/A	< 0.001
	12/2/2019	< 0.001	< 0.001	< 0.001	< 0.001
	12/2/2019	N/A	N/A	< 0.001	N/A
	3/30/2020	< 0.001	< 0.001	< 0.001	< 0.001
	3/30/2020	N/A	N/A	N/A	< 0.001
	11/17/2020	< 0.001	< 0.001	< 0.001	< 0.001
	11/17/2020	N/A	< 0.001	N/A	N/A
	5/6/2021	< 0.001	< 0.001	< 0.001	< 0.001
	5/6/2021	N/A	N/A	< 0.001	N/A
	10/7/2021	< 0.001	< 0.001	< 0.001	< 0.001
	10/7/2021	N/A	N/A	N/A	< 0.001
	4/6/2022	< 0.001	< 0.001	< 0.001	< 0.001
	4/6/2022	N/A	< 0.001	N/A	N/A
	8/23/2022	< 0.001	< 0.001	< 0.001	< 0.001
	8/23/2022	N/A	N/A	< 0.001	N/A
	3/8/2023	0.000746*	**0.00122**	< 0.001	< 0.001
	3/8/2023	N/A	N/A	N/A	< 0.001
	9/13/2023	< 0.001	**0.00789**	**0.0015**	< 0.001
	9/13/2023	< 0.001	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Tin, mg/L (CAS NO - 7440-31-5)	8/21/2009	N/A	< 0.1	N/A	N/A
	8/31/2010	N/A	< 0.1	N/A	N/A
	7/7/2011	N/A	N/A	< 0.1	< 0.1
	10/27/2011	N/A	< 0.1	N/A	N/A
	10/9/2012	N/A	N/A	< 0.1	< 0.1
	2/15/2016	N/A	< 0.005	N/A	N/A
	3/27/2017	N/A	N/A	< 0.005	< 0.005
	5/6/2021	N/A	< 0.005	N/A	N/A
	4/6/2022	N/A	N/A	< 0.005	< 0.005

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Vanadium, mg/L (CAS NO - 7440-62-2)	2/11/2008	< 0.05	< 0.05	< 0.05	N/A
	4/30/2008	< 0.0016	< 0.0016	< 0.0016	N/A
	7/9/2008	< 0.05	< 0.05	< 0.05	N/A
	9/11/2008	< 0.05	< 0.05	< 0.05	N/A
	9/11/2008	N/A	N/A	< 0.05	N/A
	12/10/2008	< 0.05	< 0.05	< 0.05	N/A
	12/10/2008	N/A	N/A	< 0.05	N/A
	3/3/2009	N/A	< 0.05	< 0.05	N/A
	3/3/2009	N/A	N/A	< 0.05	N/A
	8/21/2009	< 0.05	< 0.05	< 0.05	0.132
	8/21/2009	< 0.05	N/A	N/A	N/A
	10/21/2009	N/A	< 0.05	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.0825
	2/18/2010	N/A	N/A	N/A	0.0857
	2/18/2010	N/A	N/A	N/A	0.0685
	3/11/2010	< 0.05	< 0.05	< 0.05	< 0.05
	5/27/2010	N/A	N/A	N/A	< 0.05
	8/31/2010	< 0.05	< 0.05	< 0.05	0.0787
	8/31/2010	N/A	N/A	< 0.05	N/A
	2/16/2011	< 0.05	< 0.05	< 0.05	0.0734
	2/16/2011	N/A	N/A	N/A	0.0673
	7/7/2011	N/A	N/A	< 0.05	< 0.05
	10/27/2011	< 0.05	< 0.05	< 0.05	< 0.05
	4/26/2012	< 0.05	< 0.05	< 0.05	0.889
	4/26/2012	N/A	N/A	< 0.05	N/A
	10/9/2012	< 0.05	< 0.05	< 0.05	0.0967
	10/9/2012	< 0.05	N/A	N/A	N/A
	2/20/2013	< 0.05	< 0.05	< 0.05	0.0886
	2/20/2013	< 0.05	N/A	N/A	N/A
	10/3/2013	< 0.05	< 0.05	0.00702	0.0691
	10/3/2013	N/A	< 0.05	N/A	N/A
	4/22/2014	< 0.05	< 0.05	0.00438	0.11
	10/14/2014	< 0.05	< 0.05	0.00789	0.0401
	5/12/2015	0.00145	0.000713	0.000837	0.0578
	5/12/2015	N/A	N/A	N/A	0.0593
	7/29/2015	0.0014*	0.000971*	0.00125*	**0.019**
	7/29/2015	N/A	N/A	0.00238*	N/A
	2/15/2016	N/A	< 0.005	0.00159*	**0.0115**
	3/28/2016	0.00199*	N/A	N/A	N/A
	10/31/2016	0.0012*	0.000457*	0.000933*	**0.0254**
	3/27/2017	0.00139*	< 0.005	0.000897*	0.00381*
	3/27/2017	N/A	< 0.005	N/A	N/A
	11/13/2017	0.00134*	< 0.005	0.000965*	0.00215*
	6/6/2018	0.0038*	0.00225*	0.00396*	**0.0231**
	11/26/2018	0.00152*	0.000861*	0.000986*	0.00101*
	3/18/2019	0.00142*	< 0.005	0.000825*	**0.0101**
	3/18/2019	N/A	N/A	N/A	**0.0154**
	12/2/2019	0.00148*	< 0.005	0.00108*	0.00451*
	12/2/2019	N/A	N/A	0.00113*	N/A
	3/30/2020	< 0.005	< 0.005	< 0.005	0.0012*
	3/30/2020	N/A	N/A	N/A	0.00136*
	11/17/2020	0.00237*	< 0.005	0.00205*	0.00163*
	11/17/2020	N/A	< 0.005	N/A	N/A
	5/6/2021	0.00157*	< 0.005	0.00145*	< 0.005
	5/6/2021	N/A	N/A	0.00111*	N/A
	10/7/2021	0.0011*	< 0.005	< 0.005	< 0.005
	10/7/2021	N/A	N/A	N/A	< 0.005
	4/6/2022	0.00111*	< 0.005	< 0.005	0.00124*
	4/6/2022	N/A	< 0.005	N/A	N/A
	8/23/2022	0.00201*	< 0.005	< 0.005	< 0.005
	8/23/2022	N/A	N/A	< 0.005	N/A
	3/8/2023	0.00133*	< 0.005	< 0.005	< 0.005
	3/8/2023	N/A	N/A	N/A	< 0.005
	9/13/2023	0.00119*	< 0.005	< 0.005	**0.0101**
	9/13/2023	0.00152*	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Zinc, mg/L (CAS NO - 7440-66-6)	2/11/2008	< 0.02	< 0.02	0.0366	N/A
	4/30/2008	< 0.00527	0.0293	< 0.00527	N/A
	7/9/2008	0.0251	0.121	0.0636	N/A
	9/11/2008	< 0.02	0.0254	0.0286	N/A
	9/11/2008	N/A	N/A	0.0365	N/A
	12/10/2008	0.0213	0.0312	0.0306	N/A
	12/10/2008	N/A	N/A	0.0265	N/A
	3/3/2009	N/A	0.0561	0.0469	N/A
	3/3/2009	N/A	N/A	0.0368	N/A
	8/21/2009	< 0.02	0.0405	0.0519	0.295
	8/21/2009	< 0.02	N/A	N/A	N/A
	10/21/2009	N/A	0.0539	N/A	N/A
	12/15/2009	N/A	N/A	N/A	0.179
	2/18/2010	N/A	N/A	N/A	0.176
	2/18/2010	N/A	N/A	N/A	0.164
	3/11/2010	< 0.02	0.0755	0.0473	0.0719
	5/27/2010	N/A	N/A	N/A	0.0499
	8/31/2010	< 0.02	0.0249	0.0279	0.203
	8/31/2010	N/A	N/A	0.0216	N/A
	2/16/2011	< 0.02	< 0.02	< 0.02	0.071
	2/16/2011	N/A	N/A	N/A	0.0949
	7/7/2011	N/A	N/A	< 0.02	0.0666
	10/27/2011	< 0.02	< 0.02	< 0.02	< 0.02
	4/26/2012	0.025	< 0.02	0.0288	1.1
	4/26/2012	N/A	N/A	< 0.02	N/A
	10/9/2012	< 0.02	< 0.02	< 0.02	0.066
	10/9/2012	< 0.02	N/A	N/A	N/A
	2/20/2013	< 0.02	0.0527	0.0414	0.136
	2/20/2013	0.0285	N/A	N/A	N/A
	10/3/2013	0.0341	0.159	0.0945	0.22
	10/3/2013	N/A	0.144	N/A	N/A
	4/22/2014	< 0.02	< 0.02	< 0.04	< 0.02
	10/14/2014	< 0.02	< 0.02	< 0.02	0.0354
	5/12/2015	< 0.01	< 0.01	0.0212	0.0602
	5/12/2015	N/A	N/A	N/A	0.0816
	7/29/2015	**0.0974**	< 0.01	< 0.01	**0.0135**
	7/29/2015	N/A	N/A	< 0.01	N/A
	2/15/2016	N/A	< 0.01	< 0.01	**0.0122**
	3/28/2016	**0.0132**	N/A	N/A	N/A
	10/31/2016	**0.0125**	< 0.01	< 0.01	**0.0199**
	3/27/2017	< 0.02	< 0.02	< 0.02	< 0.02
	3/27/2017	N/A	< 0.02	N/A	N/A
	11/13/2017	< 0.02	< 0.02	< 0.02	< 0.02
	6/6/2018	0.00769*	0.0102*	< 0.02	**0.0219**
	11/26/2018	< 0.02	< 0.02	< 0.02	< 0.02
	3/18/2019	< 0.02	< 0.02	< 0.02	< 0.02
	3/18/2019	N/A	N/A	N/A	0.0111*
	12/2/2019	< 0.02	< 0.02	< 0.02	< 0.02
	12/2/2019	N/A	N/A	< 0.02	N/A
	3/30/2020	< 0.02	< 0.02	< 0.02	< 0.02
	3/30/2020	N/A	N/A	N/A	< 0.02
	11/17/2020	< 0.02	< 0.02	< 0.02	< 0.02
	11/17/2020	N/A	< 0.02	N/A	N/A
	5/6/2021	< 0.02	< 0.02	< 0.02	< 0.02
	5/6/2021	N/A	N/A	< 0.02	N/A
	10/7/2021	< 0.02	< 0.02	< 0.02	< 0.02
	10/7/2021	N/A	N/A	N/A	< 0.02
	4/6/2022	< 0.02	< 0.02	< 0.02	< 0.02
	4/6/2022	N/A	< 0.02	N/A	N/A
	8/23/2022	< 0.02	< 0.02	< 0.02	< 0.02
	8/23/2022	N/A	N/A	< 0.02	N/A
	3/8/2023	< 0.02	< 0.02	< 0.02	< 0.02
	3/8/2023	N/A	N/A	N/A	< 0.02
	9/13/2023	< 0.02	< 0.02	< 0.02	0.0151*
	9/13/2023	< 0.02	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Total Metals Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Total Suspended Solids, mg/L (CAS NO - TSS)	4/22/2014	10.3	31.7	178	11000
	7/10/2014	6	N/A	N/A	N/A
	10/14/2014	7	70.7	385	1690
	5/12/2015	4.62	39	5.63	7480
	5/12/2015	N/A	N/A	N/A	7580
	7/29/2015	**6.5**	**19.8**	**25.3**	**313**
	7/29/2015	N/A	N/A	**20.3**	N/A
	2/15/2016	N/A	**6.75**	**21**	**219**
	3/28/2016	**8.37**	N/A	N/A	N/A
	10/31/2016	**5.13**	**11**	**17.6**	**1310**
	3/27/2017	< 1.88	**7.5**	1*	**37.1**
	3/27/2017	N/A	**5.87**	N/A	N/A
	11/13/2017	**2**	**7.13**	**5.67**	**61.8**
	6/6/2018	**2**	**5**	**6**	**76**
	11/26/2018	< 1.88	**13.1**	1*	**6.75**
	3/18/2019	0.875*	**8**	1.75*	**614**
	3/18/2019	N/A	N/A	N/A	**870**
	12/2/2019	< 1.88	**7.25**	**4.13**	**110**
	12/2/2019	N/A	N/A	**3.87**	N/A
	3/30/2020	< 1.88	**17.3**	**2.38**	**5.25**
	3/30/2020	N/A	N/A	N/A	**8**
	11/17/2020	**6.5**	**7**	**17.6**	0.875*
	11/17/2020	N/A	**6**	N/A	N/A
	5/6/2021	< 1.88	**6.87**	**9.5**	1.75*
	5/6/2021	N/A	N/A	**2.63**	N/A
	10/7/2021	< 1.88	**14.5**	**2.75**	< 1.88
	10/7/2021	N/A	N/A	N/A	0.875*
	4/6/2022	< 1.88	**12.5**	1*	1*
	4/6/2022	N/A	**13**	N/A	N/A
	8/23/2022	**4.75**	**4.5**	**4.38**	1.13*
	8/23/2022	N/A	N/A	**2.25**	N/A
	3/8/2023	< 1.88	**11.3**	1.75*	**6.63**
	3/8/2023	N/A	N/A	N/A	**4.13**
	9/13/2023	1.13*	**8.25**	1.13*	**468**
	9/13/2023	< 1.88	N/A	N/A	N/A

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1,1,2-Tetrachloroethane, ug/L (CAS NO - 630-20-6)	2/11/2008	< 0.33	< 0.33	< 0.33	N/A
	4/30/2008	< 0.33	< 0.33	< 0.33	N/A
	7/9/2008	< 0.33	< 0.33	< 0.33	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1,1-Trichloroethane, ug/L (CAS NO - 71-55-6)	2/11/2008	< 0.19	< 0.19	< 0.19	N/A
	4/30/2008	< 0.19	< 0.19	< 0.19	N/A
	7/9/2008	< 0.19	< 0.19	< 0.19	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 5	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1,2,2-Tetrachloroethane, ug/L (CAS NO - 79-34-5)	2/11/2008	< 0.23	< 0.23	< 0.23	N/A
	4/30/2008	< 0.23	< 0.23	< 0.23	N/A
	7/9/2008	< 0.23	< 0.23	< 0.23	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1,2-Trichloroethane, ug/L (CAS NO - 79-00-5)	2/11/2008	< 0.37	< 0.37	< 0.37	N/A
	4/30/2008	< 0.37	< 0.37	< 0.37	N/A
	7/9/2008	< 0.37	< 0.37	< 0.37	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1-Dichloroethane, ug/L (CAS NO - 75-34-3)	2/11/2008	< 0.19	< 0.19	< 0.19	N/A
	4/30/2008	< 0.19	< 0.19	< 0.19	N/A
	7/9/2008	< 0.19	< 0.19	< 0.19	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1-Dichloroethene, ug/L (CAS NO - 75-35-4)	2/11/2008	< 0.37	< 0.37	< 0.37	N/A
	4/30/2008	< 0.37	< 0.37	< 0.37	N/A
	7/9/2008	< 0.37	< 0.37	< 0.37	N/A
	9/11/2008	< 2	< 2	< 2	N/A
	9/11/2008	N/A	N/A	< 2	N/A
	12/10/2008	< 2	< 2	< 2	N/A
	12/10/2008	N/A	N/A	< 2	N/A
	3/3/2009	N/A	< 2	< 2	N/A
	3/3/2009	N/A	N/A	< 2	N/A
	8/21/2009	< 2	< 2	< 2	< 2
	8/21/2009	< 2	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 2	< 2	< 2	< 2
	5/27/2010	N/A	N/A	N/A	< 2
	8/31/2010	< 2	< 2	< 2	< 2
	8/31/2010	N/A	N/A	< 2	N/A
	2/16/2011	< 2	< 2	< 2	< 2
	2/16/2011	N/A	N/A	N/A	< 2
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	< 2	< 2	< 2	< 2
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	< 2
	2/20/2013	< 2	N/A	N/A	N/A
	10/3/2013	< 2	< 2	< 2	< 2
	10/3/2013	N/A	< 2	N/A	N/A
	4/22/2014	< 2	< 2	< 2	< 2
	10/14/2014	< 2	< 2	< 2	< 2
	5/12/2015	< 2	< 2	< 2	< 2
	5/12/2015	N/A	N/A	N/A	< 2
	7/29/2015	< 2	< 2	< 2	< 2
	7/29/2015	N/A	N/A	< 2	N/A
	2/15/2016	N/A	< 2	< 2	< 2
	3/28/2016	< 2	N/A	N/A	N/A
	10/31/2016	< 2	< 2	< 2	< 2
	3/27/2017	< 2	< 2	< 2	< 2
	3/27/2017	N/A	< 2	N/A	N/A
	11/13/2017	< 2	< 2	< 2	< 2
	6/6/2018	< 2	< 2	< 2	< 2
	11/26/2018	< 2	< 2	< 2	< 2
	3/18/2019	< 2	< 2	< 2	< 2
	3/18/2019	N/A	N/A	N/A	< 2
	12/2/2019	< 2	< 2	< 2	< 2
	12/2/2019	N/A	N/A	< 2	N/A
	3/30/2020	< 2	< 2	< 2	< 2
	3/30/2020	N/A	N/A	N/A	< 2
	11/17/2020	< 2	< 2	< 2	< 2
	11/17/2020	N/A	< 2	N/A	N/A
	5/6/2021	< 2	< 2	< 2	< 2
	5/6/2021	N/A	N/A	< 2	N/A
	10/7/2021	< 2	< 2	< 2	< 2
	10/7/2021	N/A	N/A	N/A	< 2
	4/6/2022	< 2	< 2	< 2	< 2
	4/6/2022	N/A	< 2	N/A	N/A
	8/23/2022	< 2	< 2	< 2	< 2
	8/23/2022	N/A	N/A	< 2	N/A
	3/8/2023	< 2	< 2	< 2	< 2
	3/8/2023	N/A	N/A	N/A	< 2
	9/13/2023	< 2	< 2	< 2	< 2
	9/13/2023	< 2	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,2,3-Trichloropropane, ug/L (CAS NO - 96-18-4)	2/11/2008	< 0.7	< 0.7	< 0.7	N/A
	4/30/2008	< 0.7	< 0.7	< 0.7	N/A
	7/9/2008	< 0.7	< 0.7	< 0.7	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 2.5	< 1	< 2.5	< 2.5
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,2-Dibromo-3-Chloropropane, ug/L (CAS NO - 96-12-8)	2/11/2008	< 0.86	< 0.86	< 0.86	N/A
	4/30/2008	< 0.86	< 0.86	< 0.86	N/A
	7/9/2008	< 0.86	< 0.86	< 0.86	N/A
	9/11/2008	< 0.86	< 0.86	< 0.86	N/A
	9/11/2008	N/A	N/A	< 0.86	N/A
	12/10/2008	< 0.86	< 0.86	< 0.86	N/A
	12/10/2008	N/A	N/A	< 0.86	N/A
	3/3/2009	N/A	< 0.86	< 0.86	N/A
	3/3/2009	N/A	N/A	< 0.86	N/A
	8/21/2009	< 0.498	< 10	< 0.498	< 0.498
	8/21/2009	< 0.498	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.498
	2/18/2010	N/A	N/A	N/A	< 0.498
	2/18/2010	N/A	N/A	N/A	< 0.498
	3/11/2010	< 0.498	< 0.498	< 0.498	< 0.498
	5/27/2010	N/A	N/A	N/A	< 0.498
	8/31/2010	< 0.498	< 10	< 0.498	< 0.498
	8/31/2010	N/A	N/A	< 0.498	N/A
	2/16/2011	< 0.12	< 0.12	< 0.12	< 0.12
	2/16/2011	N/A	N/A	N/A	< 0.12
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 0.12	< 0.12	< 0.12	< 0.12
	4/26/2012	N/A	< 0.2	< 0.2	< 0.2
	10/9/2012	< 0.12	< 0.12	< 0.12	< 0.12
	10/9/2012	< 0.12	N/A	N/A	N/A
	2/20/2013	< 0.12	< 0.12	< 0.12	< 0.12
	2/20/2013	< 0.12	N/A	N/A	N/A
	10/3/2013	< 0.12	< 0.12	< 0.12	< 0.12
	10/3/2013	N/A	< 0.12	N/A	N/A
	4/22/2014	< 0.12	< 0.12	< 0.12	< 0.12
	10/14/2014	< 0.12	< 0.12	< 0.12	< 0.12
	5/12/2015	< 0.5	< 0.5	< 0.5	< 0.5
	5/12/2015	N/A	N/A	N/A	< 0.5
	7/29/2015	< 0.5	< 0.5	< 0.5	< 0.5
	7/29/2015	N/A	N/A	< 0.5	N/A
	2/15/2016	N/A	< 0.5	< 0.5	< 0.5
	3/28/2016	< 0.5	N/A	N/A	N/A
	10/31/2016	< 0.5	< 0.5	< 0.5	< 0.5
	3/27/2017	< 0.5	< 0.5	< 0.5	< 0.5
	3/27/2017	N/A	< 0.5	N/A	N/A
	11/13/2017	< 0.5	< 0.5	< 0.5	< 0.5
	6/6/2018	< 0.5	< 0.5	< 0.5	< 0.5
	11/26/2018	< 0.5	< 0.5	< 0.5	< 0.5
	3/18/2019	< 1.2	< 1.2	< 1.2	< 1.2
	3/18/2019	N/A	N/A	N/A	< 1.2
	12/2/2019	< 1.2	< 1.2	< 1.2	< 1.2
	12/2/2019	N/A	N/A	< 1.2	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,2-Dibromoethane [EDB], ug/L (CAS NO - 106-93-4)	2/11/2008	< 0.25	< 0.25	< 0.25	N/A
	4/30/2008	< 0.25	< 0.25	< 0.25	N/A
	7/9/2008	< 0.25	< 0.25	< 0.25	N/A
	9/11/2008	< 0.25	< 0.25	< 0.25	N/A
	9/11/2008	N/A	N/A	< 0.25	N/A
	12/10/2008	< 0.25	< 0.25	< 0.25	N/A
	12/10/2008	N/A	N/A	< 0.25	N/A
	3/3/2009	N/A	< 0.25	< 0.25	N/A
	3/3/2009	N/A	N/A	< 0.25	N/A
	8/21/2009	< 0.255	< 10	< 0.255	< 0.255
	8/21/2009	< 0.255	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.255
	2/18/2010	N/A	N/A	N/A	< 0.255
	2/18/2010	N/A	N/A	N/A	< 0.255
	3/11/2010	< 0.255	< 0.255	< 0.255	< 0.255
	5/27/2010	N/A	N/A	N/A	< 0.255
	8/31/2010	< 0.255	< 10	< 0.255	< 0.255
	8/31/2010	N/A	N/A	< 0.255	N/A
	2/16/2011	< 0.13	< 0.13	< 0.13	< 0.13
	2/16/2011	N/A	N/A	N/A	< 0.13
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 0.13	< 0.13	< 0.13	< 0.13
	4/26/2012	N/A	< 0.05	< 0.05	< 0.05
	10/9/2012	< 0.13	< 0.13	< 0.13	< 0.13
	10/9/2012	< 0.13	N/A	N/A	N/A
	2/20/2013	< 0.13	< 0.13	< 0.13	< 0.13
	2/20/2013	< 0.13	N/A	N/A	N/A
	10/3/2013	< 0.13	< 0.13	< 0.13	< 0.13
	10/3/2013	N/A	< 0.13	N/A	N/A
	4/22/2014	< 0.13	< 0.13	< 0.13	< 0.13
	10/14/2014	< 0.13	< 0.13	< 0.13	< 0.13
	5/12/2015	< 0.13	< 0.13	< 0.13	< 0.13
	5/12/2015	N/A	N/A	N/A	< 0.13
	7/29/2015	< 0.13	< 0.13	< 0.13	< 0.13
	7/29/2015	N/A	N/A	< 0.13	N/A
	2/15/2016	N/A	< 0.13	< 0.13	< 0.13
	3/28/2016	< 0.13	N/A	N/A	N/A
	10/31/2016	< 0.13	< 0.13	< 0.13	< 0.13
	3/27/2017	< 0.13	< 0.13	< 0.13	< 0.13
	3/27/2017	N/A	< 0.13	N/A	N/A
	11/13/2017	< 0.13	< 0.13	< 0.13	< 0.13
	6/6/2018	< 0.13	< 0.13	< 0.13	< 0.13
	11/26/2018	< 0.13	< 0.13	< 0.13	< 0.13
	3/18/2019	< 0.34	< 0.34	< 0.34	< 0.34
	3/18/2019	N/A	N/A	N/A	< 0.34
	12/2/2019	< 0.34	< 0.34	< 0.34	< 0.34
	12/2/2019	N/A	N/A	< 0.34	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,2-Dichlorobenzene, ug/L (CAS NO - 95-50-1)	2/11/2008	< 0.21	< 0.21	< 0.21	N/A
	4/30/2008	< 0.21	< 0.21	< 0.21	N/A
	7/9/2008	< 0.21	< 0.21	< 0.21	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,2-Dichloroethane, ug/L (CAS NO - 107-06-2)	2/11/2008	< 0.2	< 0.2	< 0.2	N/A
	4/30/2008	< 0.2	< 0.2	< 0.2	N/A
	7/9/2008	< 0.2	< 0.2	< 0.2	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,2-Dichloropropane, ug/L (CAS NO - 78-87-5)	2/11/2008	< 0.4	< 0.4	< 0.4	N/A
	4/30/2008	< 0.4	< 0.4	< 0.4	N/A
	7/9/2008	< 0.4	< 0.4	< 0.4	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,4-Dichlorobenzene, ug/L (CAS NO - 106-46-7)	2/11/2008	< 0.16	**0.41**	< 0.16	N/A
	4/30/2008	< 0.16	**0.41**	< 0.16	N/A
	7/9/2008	< 0.16	< 0.16	< 0.16	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	0.686*	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	0.481*	< 1	< 1
	5/12/2015	< 1	0.41*	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	0.244*	< 1	0.211*
	6/6/2018	< 1	0.264*	< 1	0.251*
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	0.234*	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
2-Butanone, ug/L (CAS NO - 78-93-3)	2/11/2008	< 0.91	< 0.91	< 0.91	N/A
	4/30/2008	< 0.91	< 0.91	< 0.91	N/A
	7/9/2008	< 0.91	< 0.91	< 0.91	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 10
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 10	< 10	< 10	< 10
	4/26/2012	N/A	< 10	< 10	< 10
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	< 10	< 10	< 10	< 10
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	< 10
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
2-Hexanone, ug/L (CAS NO - 591-78-6)	2/11/2008	< 1.76	< 1.76	< 1.76	N/A
	4/30/2008	< 1.76	< 1.76	< 1.76	N/A
	7/9/2008	< 1.76	< 1.76	< 1.76	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 20
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 10	< 10	< 10	< 10
	4/26/2012	N/A	< 10	< 10	< 10
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	< 10	< 10	< 10	< 10
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	< 10
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
4-Methyl-2-Pentanone, ug/L (CAS NO - 108-10-1)	2/11/2008	< 0.31	< 0.31	< 0.31	N/A
	4/30/2008	< 0.31	< 0.31	< 0.31	N/A
	7/9/2008	< 0.31	< 0.31	< 0.31	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 10
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 10	< 10	< 10	< 10
	4/26/2012	N/A	< 10	< 10	< 10
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	< 10	< 10	< 10	< 10
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	< 10
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Acetone, ug/L (CAS NO - 67-64-1)	2/11/2008	< 4.62	< 4.62	< 4.62	N/A
	4/30/2008	< 4.62	< 4.62	< 4.62	N/A
	7/9/2008	< 4.62	< 4.62	< 4.62	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 10
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 10	< 10	< 10	< 10
	4/26/2012	N/A	< 10	< 10	< 10
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	2.13*	< 10	< 10	1.97*
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	**16.5**	4.7*	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	2.25*	1.83*	< 10	< 10
	3/27/2017	3.86*	2.91*	< 10	< 10
	3/27/2017	N/A	3.49*	N/A	N/A
	11/13/2017	3.64*	2.71*	< 10	3.01*
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	4.08*
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Acrylonitrile, ug/L (CAS NO - 107-13-1)	2/11/2008	< 1.28	< 1.28	< 1.28	N/A
	4/30/2008	< 1.28	< 1.28	< 1.28	N/A
	7/9/2008	< 1.28	< 1.28	< 1.28	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 10
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 10	< 10	< 10	< 10
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	< 10	< 10	< 10	< 10
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	0.911*	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Benzene, ug/L (CAS NO - 71-43-2)	2/11/2008	< 0.16	**0.29**	< 0.16	N/A
	4/30/2008	< 0.16	**0.18**	< 0.16	N/A
	7/9/2008	< 0.16	**0.34**	< 0.16	N/A
	9/11/2008	< 0.5	< 0.5	< 0.5	N/A
	9/11/2008	N/A	N/A	< 0.5	N/A
	12/10/2008	< 0.5	< 0.5	< 0.5	N/A
	12/10/2008	N/A	N/A	< 0.5	N/A
	3/3/2009	N/A	**0.83**	< 0.5	N/A
	3/3/2009	N/A	N/A	< 0.5	N/A
	8/21/2009	< 0.5	< 0.5	< 0.5	< 0.5
	8/21/2009	< 0.5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 0.5
	2/18/2010	N/A	N/A	N/A	< 0.5
	2/18/2010	N/A	N/A	N/A	< 0.5
	3/11/2010	< 0.5	< 0.5	< 0.5	< 0.5
	5/27/2010	N/A	N/A	N/A	< 0.5
	8/31/2010	< 0.5	< 0.5	< 0.5	< 0.5
	8/31/2010	N/A	N/A	< 0.5	N/A
	2/16/2011	< 0.5	< 0.5	< 0.5	< 0.5
	2/16/2011	N/A	N/A	N/A	< 0.5
	7/7/2011	N/A	N/A	< 0.5	< 0.5
	10/27/2011	< 0.5	< 0.5	< 0.5	< 0.5
	4/26/2012	N/A	< 0.5	< 0.5	< 0.5
	10/9/2012	< 0.5	< 0.5	< 0.5	< 0.5
	10/9/2012	< 0.5	N/A	N/A	N/A
	2/20/2013	< 0.5	< 0.5	< 0.5	< 0.5
	2/20/2013	< 0.5	N/A	N/A	N/A
	10/3/2013	< 0.5	0.329*	< 0.5	0.158*
	10/3/2013	N/A	0.292*	N/A	N/A
	4/22/2014	< 0.5	0.386*	< 0.5	0.181*
	10/14/2014	< 0.5	0.176*	< 0.5	< 0.5
	5/12/2015	< 0.5	0.416*	< 0.5	< 0.5
	5/12/2015	N/A	N/A	N/A	< 0.5
	7/29/2015	< 0.5	0.249*	< 0.5	< 0.5
	7/29/2015	N/A	N/A	< 0.5	N/A
	2/15/2016	N/A	0.314*	< 0.5	< 0.5
	3/28/2016	< 0.5	N/A	N/A	N/A
	10/31/2016	< 0.5	0.341*	< 0.5	< 0.5
	3/27/2017	< 0.5	0.264*	< 0.5	< 0.5
	3/27/2017	N/A	0.3*	N/A	N/A
	11/13/2017	< 0.5	0.26*	< 0.5	< 0.5
	6/6/2018	< 0.5	< 0.5	< 0.5	< 0.5
	11/26/2018	< 0.5	< 0.5	< 0.5	< 0.5
	3/18/2019	< 0.5	< 0.5	< 0.5	< 0.5
	3/18/2019	N/A	N/A	N/A	< 0.5
	12/2/2019	< 0.5	< 0.5	< 0.5	< 0.5
	12/2/2019	N/A	N/A	< 0.5	N/A
	3/30/2020	< 0.5	< 0.5	< 0.5	< 0.5
	3/30/2020	N/A	N/A	N/A	< 0.5
	11/17/2020	< 0.5	< 0.5	< 0.5	< 0.5
	11/17/2020	N/A	< 0.5	N/A	N/A
	5/6/2021	< 0.5	< 0.5	< 0.5	< 0.5
	5/6/2021	N/A	N/A	< 0.5	N/A
	10/7/2021	< 0.5	< 0.5	< 0.5	< 0.5
	10/7/2021	N/A	N/A	N/A	< 0.5
	4/6/2022	< 0.5	< 0.5	< 0.5	< 0.5
	4/6/2022	N/A	< 0.5	N/A	N/A
	8/23/2022	< 0.5	< 0.5	< 0.5	< 0.5
	8/23/2022	N/A	N/A	< 0.5	N/A
	3/8/2023	< 0.5	< 0.5	< 0.5	< 0.5
	3/8/2023	N/A	N/A	N/A	< 0.5
	9/13/2023	< 0.5	< 0.5	< 0.5	< 0.5
	9/13/2023	< 0.5	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Bromochloromethane, ug/L (CAS NO - 74-97-5)	2/11/2008	< 0.76	< 0.76	< 0.76	N/A
	4/30/2008	< 0.76	< 0.76	< 0.76	N/A
	7/9/2008	< 0.76	< 0.76	< 0.76	N/A
	9/11/2008	< 5	< 5	< 5	N/A
	9/11/2008	N/A	N/A	< 5	N/A
	12/10/2008	< 5	< 5	< 5	N/A
	12/10/2008	N/A	N/A	< 5	N/A
	3/3/2009	N/A	< 5	< 5	N/A
	3/3/2009	N/A	N/A	< 5	N/A
	8/21/2009	< 5	< 5	< 5	< 5
	8/21/2009	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 5
	8/31/2010	< 5	< 5	< 5	< 5
	8/31/2010	N/A	N/A	< 5	N/A
	2/16/2011	< 5	< 5	< 5	< 5
	2/16/2011	N/A	N/A	N/A	< 5
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	< 5	< 5	< 5	< 5
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	< 5
	2/20/2013	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	< 5
	10/3/2013	N/A	< 5	N/A	N/A
	4/22/2014	< 5	< 5	< 5	< 5
	10/14/2014	< 5	< 5	< 5	< 5
	5/12/2015	< 5	< 5	< 5	< 5
	5/12/2015	N/A	N/A	N/A	< 5
	7/29/2015	< 5	< 5	< 5	< 5
	7/29/2015	N/A	N/A	< 5	N/A
	2/15/2016	N/A	< 5	< 5	< 5
	3/28/2016	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	< 5
	3/27/2017	< 5	< 5	< 5	< 5
	3/27/2017	N/A	< 5	N/A	N/A
	11/13/2017	< 5	< 5	< 5	< 5
	6/6/2018	< 5	< 5	< 5	< 5
	11/26/2018	< 5	< 5	< 5	< 5
	3/18/2019	< 5	< 5	< 5	< 5
	3/18/2019	N/A	N/A	N/A	< 5
	12/2/2019	< 5	< 5	< 5	< 5
	12/2/2019	N/A	N/A	< 5	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Bromodichloromethane, ug/L (CAS NO - 75-27-4)	2/11/2008	< 0.2	< 0.2	< 0.2	N/A
	4/30/2008	< 0.2	< 0.2	< 0.2	N/A
	7/9/2008	< 0.2	< 0.2	< 0.2	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Bromoform, ug/L (CAS NO - 75-25-2)	2/11/2008	< 0.43	< 0.43	< 0.43	N/A
	4/30/2008	< 0.43	< 0.43	< 0.43	N/A
	7/9/2008	< 0.43	< 0.43	< 0.43	N/A
	9/11/2008	< 5	< 5	< 5	N/A
	12/10/2008	< 5	< 5	< 5	N/A
	12/10/2008	N/A	N/A	< 5	N/A
	3/3/2009	N/A	< 5	< 5	N/A
	3/3/2009	N/A	N/A	< 5	N/A
	8/21/2009	< 5	< 5	< 5	< 5
	8/21/2009	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 20
	2/18/2010	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 20
	8/31/2010	< 5	< 5	< 5	< 5
	8/31/2010	N/A	N/A	< 5	N/A
	2/16/2011	< 5	< 5	< 5	< 5
	2/16/2011	N/A	N/A	N/A	< 5
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	< 5	< 5	< 5	< 5
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	< 5
	2/20/2013	< 5	N/A	N/A	N/A
	10/3/2013	< 5	0.172*	0.153*	< 5
	10/3/2013	N/A	< 5	N/A	N/A
	4/22/2014	< 5	< 5	< 5	< 5
	10/14/2014	< 5	< 5	< 5	< 5
	5/12/2015	< 5	< 5	< 5	< 5
	5/12/2015	N/A	N/A	N/A	< 5
	7/29/2015	< 5	< 5	< 5	< 5
	7/29/2015	N/A	N/A	< 5	N/A
	2/15/2016	N/A	< 5	< 5	< 5
	3/28/2016	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	< 5
	3/27/2017	< 5	< 5	< 5	< 5
	3/27/2017	N/A	< 5	N/A	N/A
	11/13/2017	< 5	< 5	< 5	< 5
	6/6/2018	< 5	< 5	< 5	< 5
	11/26/2018	< 5	< 5	< 5	< 5
	3/18/2019	< 5	< 5	< 5	< 5
	3/18/2019	N/A	N/A	N/A	< 5
	12/2/2019	< 5	< 5	< 5	< 5
	12/2/2019	N/A	N/A	< 5	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Bromomethane, ug/L (CAS NO - 74-83-9)	2/11/2008	< 0.48	< 0.48	< 0.48	N/A
	4/30/2008	< 0.48	< 0.48	< 0.48	N/A
	7/9/2008	< 0.48	< 0.48	< 0.48	N/A
	9/11/2008	< 4	< 4	< 4	N/A
	9/11/2008	N/A	N/A	< 4	N/A
	12/10/2008	< 4	< 4	< 4	N/A
	12/10/2008	N/A	N/A	< 4	N/A
	3/3/2009	N/A	< 4	< 4	N/A
	3/3/2009	N/A	N/A	< 4	N/A
	8/21/2009	< 4	< 4	< 4	< 4
	8/21/2009	< 4	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 4
	2/18/2010	N/A	N/A	N/A	< 4
	2/18/2010	N/A	N/A	N/A	< 4
	3/11/2010	< 4	< 4	< 4	< 4
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 4	< 4	< 4	< 4
	8/31/2010	N/A	N/A	< 4	N/A
	2/16/2011	< 4	< 4	< 4	< 4
	2/16/2011	N/A	N/A	N/A	< 4
	7/7/2011	N/A	N/A	< 4	< 4
	10/27/2011	< 20	< 20	< 20	< 20
	4/26/2012	N/A	< 50	< 50	< 50
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 4	< 4	< 4	< 4
	2/20/2013	< 4	N/A	N/A	N/A
	10/3/2013	< 4	< 4	**4.02**	< 4
	10/3/2013	N/A	< 4	N/A	N/A
	4/22/2014	< 4	< 4	< 4	< 4
	10/14/2014	< 4	< 4	< 4	< 4
	5/12/2015	< 4	< 4	< 4	< 4
	5/12/2015	N/A	N/A	N/A	< 4
	7/29/2015	< 4	0.676*	< 4	< 4
	7/29/2015	N/A	N/A	< 4	N/A
	2/15/2016	N/A	0.444*	< 4	< 4
	3/28/2016	< 4	N/A	N/A	N/A
	10/31/2016	< 4	< 4	< 4	< 4
	3/27/2017	< 4	< 4	< 4	< 4
	3/27/2017	N/A	< 4	N/A	N/A
	11/13/2017	0.401*	< 4	0.846*	< 4
	6/6/2018	< 4	< 4	< 4	< 4
	11/26/2018	< 4	< 4	< 4	< 4
	3/18/2019	< 4	< 4	< 4	< 4
	3/18/2019	N/A	N/A	N/A	< 4
	12/2/2019	< 4	< 4	< 4	< 4
	12/2/2019	N/A	N/A	< 4	N/A
	3/30/2020	< 4	< 4	< 4	< 4
	3/30/2020	N/A	N/A	N/A	< 4
	11/17/2020	< 4	< 4	< 4	< 4
	11/17/2020	N/A	< 4	N/A	N/A
	5/6/2021	< 4	< 4	< 4	< 4
	5/6/2021	N/A	N/A	< 4	N/A
	10/7/2021	< 4	< 4	< 4	< 4
	10/7/2021	N/A	N/A	N/A	< 4
	4/6/2022	< 4	< 4	< 4	< 4
	4/6/2022	N/A	< 4	N/A	N/A
	8/23/2022	< 4	< 4	< 4	< 4
	8/23/2022	N/A	N/A	< 4	N/A
	3/8/2023	< 4	< 4	< 4	< 4
	3/8/2023	N/A	N/A	N/A	< 4
	9/13/2023	< 4	< 4	< 4	< 4
	9/13/2023	< 4	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Carbon Disulfide, ug/L (CAS NO - 75-15-0)	2/11/2008	< 0.18	< 0.18	< 0.18	N/A
	4/30/2008	< 0.18	< 0.18	< 0.18	N/A
	7/9/2008	< 0.18	< 0.18	< 0.18	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 4	< 1	< 4	< 4
	8/31/2010	N/A	N/A	< 4	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	0.27*	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Carbon Tetrachloride, ug/L (CAS NO - 56-23-5)	2/11/2008	< 0.31	< 0.31	< 0.31	N/A
	4/30/2008	< 0.31	< 0.31	**0.37**	N/A
	7/9/2008	< 0.31	< 0.31	< 0.31	N/A
	9/11/2008	< 2	< 2	< 2	N/A
	9/11/2008	N/A	N/A	< 2	N/A
	12/10/2008	< 2	< 2	< 2	N/A
	12/10/2008	N/A	N/A	< 2	N/A
	3/3/2009	N/A	< 2	< 2	N/A
	3/3/2009	N/A	N/A	< 2	N/A
	8/21/2009	< 2	< 2	< 2	< 2
	8/21/2009	< 2	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 5	< 4	< 5	< 5
	8/31/2010	N/A	N/A	< 5	N/A
	2/16/2011	< 2	< 2	< 2	< 2
	2/16/2011	N/A	N/A	N/A	< 2
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	< 2	< 2	< 2	< 2
	4/26/2012	N/A	< 2	< 2	< 2
	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	< 2
	2/20/2013	< 2	N/A	N/A	N/A
	10/3/2013	< 2	< 2	< 2	< 2
	10/3/2013	N/A	< 2	N/A	N/A
	4/22/2014	< 2	< 2	< 2	< 2
	10/14/2014	< 2	< 2	< 2	< 2
	5/12/2015	< 2	< 2	< 2	< 2
	5/12/2015	N/A	N/A	N/A	< 2
	7/29/2015	< 2	< 2	< 2	< 2
	7/29/2015	N/A	N/A	< 2	N/A
	2/15/2016	N/A	< 2	< 2	< 2
	3/28/2016	< 2	N/A	N/A	N/A
	10/31/2016	< 2	< 2	< 2	< 2
	3/27/2017	< 2	< 2	< 2	< 2
	3/27/2017	N/A	< 2	N/A	N/A
	11/13/2017	< 2	< 2	< 2	< 2
	6/6/2018	< 2	< 2	< 2	< 2
	11/26/2018	< 2	< 2	< 2	< 2
	3/18/2019	< 2	< 2	< 2	< 2
	3/18/2019	N/A	N/A	N/A	< 2
	12/2/2019	< 2	< 2	< 2	< 2
	12/2/2019	N/A	N/A	< 2	N/A
	3/30/2020	< 2	< 2	< 2	< 2
	3/30/2020	N/A	N/A	N/A	< 2
	11/17/2020	< 2	< 2	< 2	< 2
	11/17/2020	N/A	< 2	N/A	N/A
	5/6/2021	< 2	< 2	< 2	< 2
	5/6/2021	N/A	N/A	< 2	N/A
	10/7/2021	< 2	< 2	< 2	< 2
	10/7/2021	N/A	N/A	N/A	< 2
	4/6/2022	< 2	< 2	< 2	< 2
	4/6/2022	N/A	< 2	N/A	N/A
	8/23/2022	< 2	< 2	< 2	< 2
	8/23/2022	N/A	N/A	< 2	N/A
	3/8/2023	< 2	< 2	< 2	< 2
	3/8/2023	N/A	N/A	N/A	< 2
	9/13/2023	< 2	< 2	< 2	< 2
	9/13/2023	< 2	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Chlorobenzene, ug/L (CAS NO - 108-90-7)	2/11/2008	< 0.17	**0.38**	< 0.17	N/A
	4/30/2008	< 0.17	**0.21**	< 0.17	N/A
	7/9/2008	< 0.17	< 0.17	< 0.17	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	0.518*	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	0.378*	< 1	< 1
	5/12/2015	< 1	0.357*	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	0.275*	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	0.323*	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	0.326*	N/A	N/A
	11/13/2017	< 1	0.345*	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	0.435*	< 1	< 1
	4/6/2022	N/A	0.445*	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	0.445*	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Chlorodibromomethane, ug/L (CAS NO - 124-48-1)	2/11/2008	< 0.26	**0.3**	< 0.26	N/A
	4/30/2008	< 0.26	< 0.26	< 0.26	N/A
	7/9/2008	< 0.26	< 0.26	< 0.26	N/A
	9/11/2008	< 5	< 5	< 5	N/A
	9/11/2008	N/A	N/A	< 5	N/A
	12/10/2008	< 5	< 5	< 5	N/A
	12/10/2008	N/A	N/A	< 5	N/A
	3/3/2009	N/A	< 5	< 5	N/A
	3/3/2009	N/A	N/A	< 5	N/A
	8/21/2009	< 5	< 5	< 5	< 5
	8/21/2009	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 5
	8/31/2010	< 10	< 5	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 5	< 5	< 5	< 5
	2/16/2011	N/A	N/A	N/A	< 5
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	< 5	< 5	< 5	< 5
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	< 5
	2/20/2013	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	< 5
	10/3/2013	N/A	< 5	N/A	N/A
	4/22/2014	< 5	< 5	< 5	< 5
	10/14/2014	< 5	< 5	< 5	< 5
	5/12/2015	< 5	< 5	< 5	< 5
	5/12/2015	N/A	N/A	N/A	< 5
	7/29/2015	< 5	< 5	< 5	< 5
	7/29/2015	N/A	N/A	< 5	N/A
	2/15/2016	N/A	< 5	< 5	< 5
	3/28/2016	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	< 5
	3/27/2017	< 5	< 5	< 5	< 5
	3/27/2017	N/A	< 5	N/A	N/A
	11/13/2017	< 5	< 5	< 5	< 5
	6/6/2018	< 5	< 5	< 5	< 5
	11/26/2018	< 5	< 5	< 5	< 5
	3/18/2019	< 5	< 5	< 5	< 5
	3/18/2019	N/A	N/A	N/A	< 5
	12/2/2019	< 5	< 5	< 5	< 5
	12/2/2019	N/A	N/A	< 5	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Chloroethane, ug/L (CAS NO - 75-00-3)	2/11/2008	< 0.5	< 0.5	< 0.5	N/A
	4/30/2008	< 0.5	< 0.5	< 0.5	N/A
	7/9/2008	< 0.5	< 0.5	< 0.5	N/A
	9/11/2008	< 4	< 4	< 4	N/A
	9/11/2008	N/A	N/A	< 4	N/A
	12/10/2008	< 4	< 4	< 4	N/A
	12/10/2008	N/A	N/A	< 4	N/A
	3/3/2009	N/A	< 4	< 4	N/A
	3/3/2009	N/A	N/A	< 4	N/A
	8/21/2009	< 4	< 4	< 4	< 4
	8/21/2009	< 4	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 4
	2/18/2010	N/A	N/A	N/A	< 4
	2/18/2010	N/A	N/A	N/A	< 4
	3/11/2010	< 4	< 4	< 4	< 4
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 4	< 4	< 4	< 4
	8/31/2010	N/A	N/A	< 4	N/A
	2/16/2011	< 4	< 4	< 4	< 4
	2/16/2011	N/A	N/A	N/A	< 4
	7/7/2011	N/A	N/A	< 4	< 4
	10/27/2011	< 4	< 4	< 4	< 4
	4/26/2012	N/A	< 4	< 4	< 4
	10/9/2012	< 4	< 4	< 4	< 4
	10/9/2012	< 4	N/A	N/A	N/A
	2/20/2013	< 4	< 4	< 4	< 4
	2/20/2013	< 4	N/A	N/A	N/A
	10/3/2013	< 4	< 4	< 4	< 4
	10/3/2013	N/A	< 4	N/A	N/A
	4/22/2014	< 4	< 4	< 4	< 4
	10/14/2014	< 4	< 4	< 4	< 4
	5/12/2015	< 4	< 4	< 4	< 4
	5/12/2015	N/A	N/A	N/A	< 4
	7/29/2015	< 4	< 4	< 4	< 4
	7/29/2015	N/A	N/A	< 4	N/A
	2/15/2016	N/A	< 4	< 4	< 4
	3/28/2016	< 4	N/A	N/A	N/A
	10/31/2016	< 4	< 4	< 4	< 4
	3/27/2017	< 4	< 4	< 4	< 4
	3/27/2017	N/A	< 4	N/A	N/A
	11/13/2017	< 4	< 4	< 4	< 4
	6/6/2018	< 4	< 4	< 4	< 4
	11/26/2018	< 4	< 4	< 4	< 4
	3/18/2019	< 4	< 4	< 4	< 4
	3/18/2019	N/A	N/A	N/A	< 4
	12/2/2019	< 4	< 4	< 4	< 4
	12/2/2019	N/A	N/A	< 4	N/A
	3/30/2020	< 4	< 4	< 4	< 4
	3/30/2020	N/A	N/A	N/A	< 4
	11/17/2020	< 4	< 4	< 4	< 4
	11/17/2020	N/A	< 4	N/A	N/A
	5/6/2021	< 4	< 4	< 4	< 4
	5/6/2021	N/A	N/A	< 4	N/A
	10/7/2021	< 4	< 4	< 4	< 4
	10/7/2021	N/A	N/A	N/A	< 4
	4/6/2022	< 4	< 4	< 4	< 4
	4/6/2022	N/A	< 4	N/A	N/A
	8/23/2022	< 4	< 4	< 4	< 4
	8/23/2022	N/A	N/A	< 4	N/A
	3/8/2023	< 4	< 4	< 4	< 4
	3/8/2023	N/A	N/A	N/A	< 4
	9/13/2023	< 4	< 4	< 4	< 4
	9/13/2023	< 4	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Chloroform, ug/L (CAS NO - 67-66-3)	2/11/2008	< 0.17	< 0.17	< 0.17	N/A
	4/30/2008	< 0.17	< 0.17	< 0.17	N/A
	7/9/2008	< 0.17	< 0.17	< 0.17	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 2.5	< 2.5	< 2.5	N/A
	12/10/2008	N/A	N/A	< 2.5	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 3	< 3	< 3	< 3
	11/26/2018	< 3	< 3	< 3	< 3
	3/18/2019	< 3	< 3	< 3	< 3
	3/18/2019	N/A	N/A	N/A	< 3
	12/2/2019	< 3	< 3	< 3	< 3
	12/2/2019	N/A	N/A	< 3	N/A
	3/30/2020	< 3	< 3	< 3	< 3
	3/30/2020	N/A	N/A	N/A	< 3
	11/17/2020	< 3	< 3	< 3	< 3
	11/17/2020	N/A	< 3	N/A	N/A
	5/6/2021	< 3	< 3	< 3	< 3
	5/6/2021	N/A	N/A	< 3	N/A
	10/7/2021	< 3	< 3	< 3	< 3
	10/7/2021	N/A	N/A	N/A	< 3
	4/6/2022	< 3	< 3	< 3	< 3
	4/6/2022	N/A	< 3	N/A	N/A
	8/23/2022	< 3	< 3	< 3	< 3
	8/23/2022	N/A	N/A	< 3	N/A
	3/8/2023	< 3	< 3	< 3	< 3
	3/8/2023	N/A	N/A	N/A	< 3
	9/13/2023	< 3	< 3	< 3	< 3
	9/13/2023	< 3	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Chloromethane, ug/L (CAS NO - 74-87-3)	2/11/2008	< 0.2	< 0.2	< 0.2	N/A
	4/30/2008	< 0.2	< 0.2	< 0.2	N/A
	7/9/2008	< 0.2	< 0.2	< 0.2	N/A
	9/11/2008	< 3	< 3	< 3	N/A
	9/11/2008	N/A	N/A	< 3	N/A
	12/10/2008	< 3	< 3	< 3	N/A
	12/10/2008	N/A	N/A	< 3	N/A
	3/3/2009	N/A	< 3	< 3	N/A
	3/3/2009	N/A	N/A	< 3	N/A
	8/21/2009	< 3	< 3	< 3	< 3
	8/21/2009	< 3	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 3
	2/18/2010	N/A	N/A	N/A	< 3
	2/18/2010	N/A	N/A	N/A	< 3
	3/11/2010	< 3	< 3	< 3	< 3
	5/27/2010	N/A	N/A	N/A	< 3
	8/31/2010	< 3	< 3	< 3	< 3
	8/31/2010	N/A	N/A	< 3	N/A
	2/16/2011	< 3	< 3	< 3	< 3
	2/16/2011	N/A	N/A	N/A	< 3
	7/7/2011	N/A	N/A	< 3	< 3
	10/27/2011	< 3	< 3	< 3	< 3
	4/26/2012	N/A	< 3	< 3	< 3
	10/9/2012	< 3	< 3	< 3	< 3
	10/9/2012	< 3	N/A	N/A	N/A
	2/20/2013	< 3	< 3	< 3	< 3
	2/20/2013	< 3	N/A	N/A	N/A
	10/3/2013	< 3	< 3	< 3	< 3
	10/3/2013	N/A	< 3	N/A	N/A
	4/22/2014	< 3	< 3	< 3	< 3
	10/14/2014	< 3	< 3	< 3	< 3
	5/12/2015	< 3	< 3	< 3	< 3
	5/12/2015	N/A	N/A	N/A	< 3
	7/29/2015	< 3	< 3	< 3	< 3
	7/29/2015	N/A	N/A	< 3	N/A
	2/15/2016	N/A	< 3	< 3	< 3
	3/28/2016	< 3	N/A	N/A	N/A
	10/31/2016	< 3	< 3	< 3	< 3
	3/27/2017	< 3	< 3	< 3	< 3
	3/27/2017	N/A	< 3	N/A	N/A
	11/13/2017	< 3	< 3	< 3	< 3
	6/6/2018	< 3	< 3	< 3	< 3
	11/26/2018	< 3	< 3	< 3	< 3
	3/18/2019	< 3	< 3	< 3	< 3
	3/18/2019	N/A	N/A	N/A	< 3
	12/2/2019	< 3	< 3	< 3	< 3
	12/2/2019	N/A	N/A	< 3	N/A
	3/30/2020	< 3	< 3	< 3	< 3
	3/30/2020	N/A	N/A	N/A	< 3
	11/17/2020	< 3	< 3	< 3	< 3
	11/17/2020	N/A	< 3	N/A	N/A
	5/6/2021	< 3	< 3	< 3	< 3
	5/6/2021	N/A	N/A	< 3	N/A
	10/7/2021	< 3	< 3	< 3	< 3
	10/7/2021	N/A	N/A	N/A	< 3
	4/6/2022	< 3	< 3	< 3	< 3
	4/6/2022	N/A	< 3	N/A	N/A
	8/23/2022	< 3	< 3	< 3	< 3
	8/23/2022	N/A	N/A	< 3	N/A
	3/8/2023	< 3	< 3	< 3	< 3
	3/8/2023	N/A	N/A	N/A	< 3
	9/13/2023	< 3	< 3	< 3	< 3
	9/13/2023	< 3	N/A	N/A	N/A

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Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
cis-1,2-Dichloroethene, ug/L (CAS NO - 156-59-2)	2/11/2008	< 0.37	**1.12**	< 0.37	N/A
	4/30/2008	< 0.37	< 0.37	< 0.37	N/A
	7/9/2008	< 0.37	**1.36**	< 0.37	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	**1.28**	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	**2.36**	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	**1.07**	< 1	< 1
	10/3/2013	N/A	**1.18**	N/A	N/A
	4/22/2014	< 1	**1.24**	< 1	< 1
	10/14/2014	< 1	0.571*	< 1	< 1
	5/12/2015	< 1	0.593*	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	0.339*	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	0.829*	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	0.802*	< 1	< 1
	3/27/2017	< 1	0.601*	< 1	< 1
	3/27/2017	N/A	0.755*	N/A	N/A
	11/13/2017	< 1	**1.02**	< 1	< 1
	6/6/2018	< 1	0.779*	< 1	< 1
	11/26/2018	< 1	0.549*	< 1	< 1
	3/18/2019	< 1	0.622*	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	0.581*	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	0.617*	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	0.22*	< 1	< 1
	11/17/2020	N/A	0.236*	N/A	N/A
	5/6/2021	< 1	0.503*	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	0.373*	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	0.399*	< 1	< 1
	4/6/2022	N/A	0.356*	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	0.299*	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
cis-1,3-Dichloropropene, ug/L (CAS NO - 10061-01-5)	2/11/2008	< 0.23	< 0.23	< 0.23	N/A
	4/30/2008	< 0.23	< 0.23	< 0.23	N/A
	7/9/2008	< 0.23	< 0.23	< 0.23	N/A
	9/11/2008	< 5	< 5	< 5	N/A
	9/11/2008	N/A	N/A	< 5	N/A
	12/10/2008	< 5	< 5	< 5	N/A
	12/10/2008	N/A	N/A	< 5	N/A
	3/3/2009	N/A	< 5	< 5	N/A
	3/3/2009	N/A	N/A	< 5	N/A
	8/21/2009	< 5	< 5	< 5	< 5
	8/21/2009	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 5
	8/31/2010	< 10	< 5	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 5	< 5	< 5	< 5
	2/16/2011	N/A	N/A	N/A	< 5
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	< 5	< 5	< 5	< 5
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	< 5
	2/20/2013	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	< 5
	10/3/2013	N/A	< 5	N/A	N/A
	4/22/2014	< 5	< 5	< 5	< 5
	10/14/2014	< 5	< 5	< 5	< 5
	5/12/2015	< 5	< 5	< 5	< 5
	5/12/2015	N/A	N/A	N/A	< 5
	7/29/2015	< 5	< 5	< 5	< 5
	7/29/2015	N/A	N/A	< 5	N/A
	2/15/2016	N/A	< 5	< 5	< 5
	3/28/2016	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	< 5
	3/27/2017	< 5	< 5	< 5	< 5
	3/27/2017	N/A	< 5	N/A	N/A
	11/13/2017	< 5	< 5	< 5	< 5
	6/6/2018	< 5	< 5	< 5	< 5
	11/26/2018	< 5	< 5	< 5	< 5
	3/18/2019	< 5	< 5	< 5	< 5
	3/18/2019	N/A	N/A	N/A	< 5
	12/2/2019	< 5	< 5	< 5	< 5
	12/2/2019	N/A	N/A	< 5	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Ethylbenzene, ug/L (CAS NO - 100-41-4)	2/11/2008	< 0.25	< 0.25	< 0.25	N/A
	4/30/2008	< 0.25	< 0.25	< 0.25	N/A
	7/9/2008	< 0.25	< 0.25	< 0.25	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Iodomethane, ug/L (CAS NO - 74-88-4)	2/11/2008	< 0.4	< 0.4	< 0.4	N/A
	4/30/2008	< 0.4	< 0.4	< 0.4	N/A
	7/9/2008	< 0.4	< 0.4	< 0.4	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 10	< 10	< 10	< 10
	5/27/2010	N/A	N/A	N/A	< 10
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 20	< 20
	10/27/2011	< 20	< 20	< 20	< 20
	4/26/2012	N/A	< 10	< 10	< 10
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	< 10	< 10	< 10	< 10
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	< 10
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Methylene Bromide, ug/L (CAS NO - 74-95-3)	2/11/2008	< 0.3	< 0.3	< 0.3	N/A
	4/30/2008	< 0.3	< 0.3	< 0.3	N/A
	7/9/2008	< 0.3	< 0.3	< 0.3	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 50	< 50	< 50	< 50
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Methylene Chloride, ug/L (CAS NO - 75-09-2)	2/11/2008	< 0.45	< 0.45	< 0.45	N/A
	4/30/2008	< 0.45	< 0.45	< 0.45	N/A
	7/9/2008	**0.8**	**0.5**	< 0.45	N/A
	9/11/2008	< 5	< 5	< 5	N/A
	9/11/2008	N/A	N/A	< 5	N/A
	12/10/2008	< 5	< 5	< 5	N/A
	12/10/2008	N/A	N/A	< 5	N/A
	3/3/2009	N/A	< 5	< 5	N/A
	3/3/2009	N/A	N/A	< 5	N/A
	8/21/2009	< 5	< 5	< 5	< 5
	8/21/2009	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 5
	8/31/2010	< 5	< 5	< 5	< 5
	8/31/2010	N/A	N/A	< 5	N/A
	2/16/2011	< 5	< 5	< 5	< 5
	2/16/2011	N/A	N/A	N/A	< 5
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	< 5	< 5	< 5	< 5
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	< 5
	2/20/2013	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	< 5
	10/3/2013	N/A	< 5	N/A	N/A
	4/22/2014	< 5	< 5	< 5	< 5
	10/14/2014	< 5	< 5	< 5	< 5
	5/12/2015	< 5	< 5	< 5	< 5
	5/12/2015	N/A	N/A	N/A	< 5
	7/29/2015	< 5	< 5	< 5	< 5
	7/29/2015	N/A	N/A	0.284*	N/A
	2/15/2016	N/A	0.729*	0.255*	< 5
	3/28/2016	< 5	N/A	N/A	N/A
	10/31/2016	0.345*	0.527*	0.311*	0.512*
	3/27/2017	< 5	< 5	< 5	< 5
	3/27/2017	N/A	< 5	N/A	N/A
	11/13/2017	< 5	< 5	< 5	< 5
	6/6/2018	< 5	< 5	< 5	< 5
	11/26/2018	< 5	< 5	< 5	< 5
	3/18/2019	< 5	< 5	< 5	< 5
	3/18/2019	N/A	N/A	N/A	< 5
	12/2/2019	< 5	< 5	< 5	< 5
	12/2/2019	N/A	N/A	< 5	N/A
	3/30/2020	< 5	< 5	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Styrene, ug/L (CAS NO - 100-42-5)	2/11/2008	< 0.19	< 0.19	< 0.19	N/A
	4/30/2008	< 0.19	< 0.19	< 0.19	N/A
	7/9/2008	< 0.19	< 0.19	< 0.19	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 4	< 1	< 4	< 4
	8/31/2010	N/A	N/A	< 4	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Tetrachloroethene, ug/L (CAS NO - 127-18-4)	2/11/2008	**0.58**	**0.76**	**0.52**	N/A
	4/30/2008	< 0.38	< 0.38	< 0.38	N/A
	7/9/2008	< 0.38	< 0.38	< 0.38	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	0.238*	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	0.395*	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Toluene, ug/L (CAS NO - 108-88-3)	2/11/2008	< 0.14	< 0.14	< 0.14	N/A
	4/30/2008	< 0.14	< 0.14	< 0.14	N/A
	7/9/2008	< 0.14	< 0.14	< 0.14	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	0.237*	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	0.266*	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	0.78*
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	0.552*	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
trans-1,2-Dichloroethene, ug/L (CAS NO - 156-60-5)	2/11/2008	< 0.31	< 0.31	< 0.31	N/A
	4/30/2008	< 0.31	< 0.31	< 0.31	N/A
	7/9/2008	< 0.31	< 0.31	< 0.31	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 50	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
trans-1,3-Dichloropropene, ug/L (CAS NO - 10061-02-6)	2/11/2008	< 0.17	< 0.17	< 0.17	N/A
	4/30/2008	< 0.17	< 0.17	< 0.17	N/A
	7/9/2008	< 0.17	< 0.17	< 0.17	N/A
	9/11/2008	< 5	< 5	< 5	N/A
	9/11/2008	N/A	N/A	< 5	N/A
	12/10/2008	< 5	< 5	< 5	N/A
	12/10/2008	N/A	N/A	< 5	N/A
	3/3/2009	N/A	< 5	< 5	N/A
	3/3/2009	N/A	N/A	< 5	N/A
	8/21/2009	< 5	< 5	< 5	< 5
	8/21/2009	< 5	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 20
	2/18/2010	N/A	N/A	N/A	< 5
	2/18/2010	N/A	N/A	N/A	< 5
	3/11/2010	< 5	< 5	< 5	< 5
	5/27/2010	N/A	N/A	N/A	< 5
	8/31/2010	< 10	< 5	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 5	< 5	< 5	< 5
	2/16/2011	N/A	N/A	N/A	< 5
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 5	< 5	< 5	< 5
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 5	< 5	< 5	< 5
	10/9/2012	< 5	N/A	N/A	N/A
	2/20/2013	< 5	< 5	< 5	< 5
	2/20/2013	< 5	N/A	N/A	N/A
	10/3/2013	< 5	< 5	< 5	< 5
	10/3/2013	N/A	< 5	N/A	N/A
	4/22/2014	< 5	< 5	< 5	< 5
	10/14/2014	< 5	< 5	< 5	< 5
	5/12/2015	< 5	< 5	< 5	< 5
	5/12/2015	N/A	N/A	N/A	< 5
	7/29/2015	< 5	< 5	< 5	< 5
	7/29/2015	N/A	N/A	< 5	N/A
	2/15/2016	N/A	< 5	< 5	< 5
	3/28/2016	< 5	N/A	N/A	N/A
	10/31/2016	< 5	< 5	< 5	< 5
	3/27/2017	< 5	< 5	< 5	< 5
	3/27/2017	N/A	< 5	N/A	N/A
	11/13/2017	< 5	< 5	< 5	< 5
	6/6/2018	< 5	< 5	< 5	< 5
	11/26/2018	< 5	< 5	< 5	< 5
	3/18/2019	< 5	< 5	< 5	< 5
	3/18/2019	N/A	N/A	N/A	< 5
	12/2/2019	< 5	< 5	< 5	< 5
	12/2/2019	N/A	N/A	< 5	N/A
	3/30/2020	< 5	< 5	< 5	< 5
	3/30/2020	N/A	N/A	N/A	< 5
	11/17/2020	< 5	< 5	< 5	< 5
	11/17/2020	N/A	< 5	N/A	N/A
	5/6/2021	< 5	< 5	< 5	< 5
	5/6/2021	N/A	N/A	< 5	N/A
	10/7/2021	< 5	< 5	< 5	< 5
	10/7/2021	N/A	N/A	N/A	< 5
	4/6/2022	< 5	< 5	< 5	< 5
	4/6/2022	N/A	< 5	N/A	N/A
	8/23/2022	< 5	< 5	< 5	< 5
	8/23/2022	N/A	N/A	< 5	N/A
	3/8/2023	< 5	< 5	< 5	< 5
	3/8/2023	N/A	N/A	N/A	< 5
	9/13/2023	< 5	< 5	< 5	< 5
	9/13/2023	< 5	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
trans-1,4-Dichloro-2-Butene, ug/L (CAS NO - 110-57-6)	2/11/2008	< 1.8	< 1.8	< 1.8	N/A
	4/30/2008	< 1.8	< 1.8	< 1.8	N/A
	7/9/2008	< 1.8	< 1.8	< 1.8	N/A
	9/11/2008	< 10	< 10	< 10	N/A
	9/11/2008	N/A	N/A	< 10	N/A
	12/10/2008	< 10	< 10	< 10	N/A
	12/10/2008	N/A	N/A	< 10	N/A
	3/3/2009	N/A	< 10	< 10	N/A
	3/3/2009	N/A	N/A	< 10	N/A
	8/21/2009	< 10	< 10	< 10	< 10
	8/21/2009	< 10	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	2/18/2010	N/A	N/A	N/A	< 10
	3/11/2010	< 50	< 50	< 50	< 50
	5/27/2010	N/A	N/A	N/A	< 10
	8/31/2010	< 10	< 10	< 10	< 10
	8/31/2010	N/A	N/A	< 10	N/A
	2/16/2011	< 10	< 10	< 10	< 10
	2/16/2011	N/A	N/A	N/A	< 10
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	< 10	< 10	< 10	< 10
	4/26/2012	N/A	< 10	< 10	< 10
	10/9/2012	< 10	< 10	< 10	< 10
	10/9/2012	< 10	N/A	N/A	N/A
	2/20/2013	< 10	< 10	< 10	< 10
	2/20/2013	< 10	N/A	N/A	N/A
	10/3/2013	< 10	< 10	< 10	< 10
	10/3/2013	N/A	< 10	N/A	N/A
	4/22/2014	< 10	< 10	< 10	< 10
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	< 10
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Trichloroethene, ug/L (CAS NO - 79-01-6)	2/11/2008	< 0.24	< 0.24	< 0.24	N/A
	4/30/2008	< 0.24	< 0.24	< 0.24	N/A
	7/9/2008	< 0.24	< 0.24	< 0.24	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	< 1	N/A	N/A
	4/22/2014	< 1	< 1	< 1	< 1
	10/14/2014	0.418*	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	< 1	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	< 1	< 1	< 1
	3/27/2017	N/A	< 1	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	0.495*	0.485*	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Trichlorofluoromethane, ug/L (CAS NO - 75-69-4)	2/11/2008	< 0.26	< 0.26	< 0.26	N/A
	4/30/2008	< 0.26	< 0.26	< 0.26	N/A
	7/9/2008	< 0.26	< 0.26	< 0.26	N/A
	9/11/2008	< 4	< 4	< 4	N/A
	9/11/2008	N/A	N/A	< 4	N/A
	12/10/2008	< 4	< 4	< 4	N/A
	12/10/2008	N/A	N/A	< 4	N/A
	3/3/2009	N/A	< 4	< 4	N/A
	3/3/2009	N/A	N/A	< 4	N/A
	8/21/2009	< 4	< 4	< 4	< 4
	8/21/2009	< 4	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 4
	2/18/2010	N/A	N/A	N/A	< 4
	2/18/2010	N/A	N/A	N/A	< 4
	3/11/2010	< 4	< 4	< 4	< 4
	5/27/2010	N/A	N/A	N/A	< 4
	8/31/2010	< 4	< 4	< 4	< 4
	8/31/2010	N/A	N/A	< 4	N/A
	2/16/2011	< 4	< 4	< 4	< 4
	2/16/2011	N/A	N/A	N/A	< 4
	7/7/2011	N/A	N/A	< 4	< 4
	10/27/2011	< 4	< 4	< 4	< 4
	4/26/2012	N/A	< 4	< 4	< 4
	10/9/2012	< 4	< 4	< 4	< 4
	10/9/2012	< 4	N/A	N/A	N/A
	2/20/2013	< 4	< 4	< 4	< 4
	2/20/2013	< 4	N/A	N/A	N/A
	10/3/2013	< 4	< 4	< 4	< 4
	10/3/2013	N/A	< 4	N/A	N/A
	4/22/2014	< 4	< 4	< 4	< 4
	10/14/2014	< 4	< 4	< 4	< 4
	5/12/2015	< 4	< 4	< 4	< 4
	5/12/2015	N/A	N/A	N/A	< 4
	7/29/2015	< 4	< 4	< 4	< 4
	7/29/2015	N/A	N/A	< 4	N/A
	2/15/2016	N/A	< 4	< 4	< 4
	3/28/2016	< 4	N/A	N/A	N/A
	10/31/2016	< 4	< 4	< 4	< 4
	3/27/2017	< 4	< 4	< 4	< 4
	3/27/2017	N/A	< 4	N/A	N/A
	11/13/2017	< 4	< 4	< 4	< 4
	6/6/2018	< 4	< 4	< 4	< 4
	11/26/2018	< 4	< 4	< 4	< 4
	3/18/2019	< 4	< 4	< 4	< 4
	3/18/2019	N/A	N/A	N/A	< 4
	12/2/2019	< 4	< 4	< 4	< 4
	12/2/2019	N/A	N/A	< 4	N/A
	3/30/2020	< 4	< 4	< 4	< 4
	3/30/2020	N/A	N/A	N/A	< 4
	11/17/2020	< 4	< 4	< 4	< 4
	11/17/2020	N/A	< 4	N/A	N/A
	5/6/2021	< 4	< 4	< 4	< 4
	5/6/2021	N/A	N/A	< 4	N/A
	10/7/2021	< 4	< 4	< 4	< 4
	10/7/2021	N/A	N/A	N/A	< 4
	4/6/2022	< 4	< 4	< 4	< 4
	4/6/2022	N/A	< 4	N/A	N/A
	8/23/2022	< 4	< 4	< 4	< 4
	8/23/2022	N/A	N/A	< 4	N/A
	3/8/2023	< 4	< 4	< 4	< 4
	3/8/2023	N/A	N/A	N/A	< 4
	9/13/2023	< 4	< 4	< 4	< 4
	9/13/2023	< 4	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Vinyl Acetate, ug/L (CAS NO - 108-05-4)	2/11/2008	< 1.36	< 1.36	< 1.36	N/A
	4/30/2008	< 1.36	< 1.36	< 1.36	N/A
	7/9/2008	< 1.36	< 1.36	< 1.36	N/A
	9/11/2008	< 2.5	< 2.5	< 2.5	N/A
	9/11/2008	N/A	N/A	< 2.5	N/A
	12/10/2008	< 2	< 2	< 2	N/A
	12/10/2008	N/A	N/A	< 2	N/A
	3/3/2009	N/A	< 2	< 2	N/A
	3/3/2009	N/A	N/A	< 2	N/A
	8/21/2009	< 2	< 2	< 2	< 2
	8/21/2009	< 2	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	2/18/2010	N/A	N/A	N/A	< 2
	3/11/2010	< 2	< 10	< 2	< 2
	5/27/2010	N/A	N/A	N/A	< 2
	8/31/2010	< 2	< 2	< 2	< 2
	8/31/2010	N/A	N/A	< 2	N/A
	2/16/2011	< 4	< 4	< 4	< 4
	2/16/2011	N/A	N/A	N/A	< 4
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	< 2	< 2	< 2	< 2
	4/26/2012	N/A	< 5	< 5	< 5
	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	< 2
	2/20/2013	< 2	N/A	N/A	N/A
	10/3/2013	< 2	< 2	< 2	< 2
	10/3/2013	N/A	< 2	N/A	N/A
	4/22/2014	< 2	< 2	< 2	< 2
	10/14/2014	< 10	< 10	< 10	< 10
	5/12/2015	< 10	< 10	< 10	< 10
	5/12/2015	N/A	N/A	N/A	< 10
	7/29/2015	< 10	< 10	< 10	< 10
	7/29/2015	N/A	N/A	< 10	N/A
	2/15/2016	N/A	< 10	< 10	< 10
	3/28/2016	< 10	N/A	N/A	N/A
	10/31/2016	< 10	< 10	< 10	< 10
	3/27/2017	< 10	< 10	< 10	< 10
	3/27/2017	N/A	< 10	N/A	N/A
	11/13/2017	< 10	< 10	< 10	< 10
	6/6/2018	< 10	< 10	< 10	< 10
	11/26/2018	< 10	< 10	< 10	< 10
	3/18/2019	< 10	< 10	< 10	< 10
	3/18/2019	N/A	N/A	N/A	< 10
	12/2/2019	< 10	< 10	< 10	< 10
	12/2/2019	N/A	N/A	< 10	N/A
	3/30/2020	< 10	< 10	< 10	< 10
	3/30/2020	N/A	N/A	N/A	< 10
	11/17/2020	< 10	< 10	< 10	< 10
	11/17/2020	N/A	< 10	N/A	N/A
	5/6/2021	< 10	< 10	< 10	< 10
	5/6/2021	N/A	N/A	< 10	N/A
	10/7/2021	< 10	< 10	< 10	< 10
	10/7/2021	N/A	N/A	N/A	< 10
	4/6/2022	< 10	< 10	< 10	< 10
	4/6/2022	N/A	< 10	N/A	N/A
	8/23/2022	< 10	< 10	< 10	< 10
	8/23/2022	N/A	N/A	< 10	N/A
	3/8/2023	< 10	< 10	< 10	< 10
	3/8/2023	N/A	N/A	N/A	< 10
	9/13/2023	< 10	< 10	< 10	< 10
	9/13/2023	< 10	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Vinyl Chloride, ug/L (CAS NO - 75-01-4)	2/11/2008	< 0.26	**0.39**	< 0.26	N/A
	4/30/2008	< 0.26	< 0.26	< 0.26	N/A
	7/9/2008	< 0.26	**0.28**	< 0.26	N/A
	9/11/2008	< 1	< 1	< 1	N/A
	9/11/2008	N/A	N/A	< 1	N/A
	12/10/2008	< 1	< 1	< 1	N/A
	12/10/2008	N/A	N/A	< 1	N/A
	3/3/2009	N/A	< 1	< 1	N/A
	3/3/2009	N/A	N/A	< 1	N/A
	8/21/2009	< 1	< 1	< 1	< 1
	8/21/2009	< 1	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	2/18/2010	N/A	N/A	N/A	< 1
	3/11/2010	< 1	< 1	< 1	< 1
	5/27/2010	N/A	N/A	N/A	< 1
	8/31/2010	< 1	< 1	< 1	< 1
	8/31/2010	N/A	N/A	< 1	N/A
	2/16/2011	< 1	< 1	< 1	< 1
	2/16/2011	N/A	N/A	N/A	< 1
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	< 1	< 1	< 1	< 1
	4/26/2012	N/A	< 1	< 1	< 1
	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A
	10/3/2013	< 1	< 1	< 1	< 1
	10/3/2013	N/A	0.183*	N/A	N/A
	4/22/2014	< 1	0.194*	< 1	< 1
	10/14/2014	< 1	< 1	< 1	< 1
	5/12/2015	< 1	< 1	< 1	< 1
	5/12/2015	N/A	N/A	N/A	< 1
	7/29/2015	< 1	< 1	< 1	< 1
	7/29/2015	N/A	N/A	< 1	N/A
	2/15/2016	N/A	0.146*	< 1	< 1
	3/28/2016	< 1	N/A	N/A	N/A
	10/31/2016	< 1	< 1	< 1	< 1
	3/27/2017	< 1	0.112*	< 1	< 1
	3/27/2017	N/A	0.112*	N/A	N/A
	11/13/2017	< 1	< 1	< 1	< 1
	6/6/2018	< 1	< 1	< 1	< 1
	11/26/2018	< 1	< 1	< 1	< 1
	3/18/2019	< 1	< 1	< 1	< 1
	3/18/2019	N/A	N/A	N/A	< 1
	12/2/2019	< 1	< 1	< 1	< 1
	12/2/2019	N/A	N/A	< 1	N/A
	3/30/2020	< 1	< 1	< 1	< 1
	3/30/2020	N/A	N/A	N/A	< 1
	11/17/2020	< 1	< 1	< 1	< 1
	11/17/2020	N/A	< 1	N/A	N/A
	5/6/2021	< 1	< 1	< 1	< 1
	5/6/2021	N/A	N/A	< 1	N/A
	10/7/2021	< 1	< 1	< 1	< 1
	10/7/2021	N/A	N/A	N/A	< 1
	4/6/2022	< 1	< 1	< 1	< 1
	4/6/2022	N/A	< 1	N/A	N/A
	8/23/2022	< 1	< 1	< 1	< 1
	8/23/2022	N/A	N/A	< 1	N/A
	3/8/2023	< 1	< 1	< 1	< 1
	3/8/2023	N/A	N/A	N/A	< 1
	9/13/2023	< 1	< 1	< 1	< 1
	9/13/2023	< 1	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Xylenes, total, ug/L (CAS NO - 1330-20-7)	2/11/2008	< 0.3	< 0.3	< 0.3	N/A
	4/30/2008	< 0.3	< 0.3	< 0.3	N/A
	7/9/2008	< 0.3	< 0.3	< 0.3	N/A
	9/11/2008	< 3	< 3	< 3	N/A
	9/11/2008	N/A	N/A	< 3	N/A
	12/10/2008	< 3	< 3	< 3	N/A
	12/10/2008	N/A	N/A	< 3	N/A
	3/3/2009	N/A	< 3	< 3	N/A
	3/3/2009	N/A	N/A	< 3	N/A
	8/21/2009	< 3	< 3	< 3	< 3
	8/21/2009	< 3	N/A	N/A	N/A
	12/15/2009	N/A	N/A	N/A	< 9
	2/18/2010	N/A	N/A	N/A	< 3
	2/18/2010	N/A	N/A	N/A	< 3
	3/11/2010	< 7.5	< 5	< 7.5	< 7.5
	5/27/2010	N/A	N/A	N/A	< 12
	8/31/2010	< 3	< 3	< 3	< 3
	8/31/2010	N/A	N/A	< 3	N/A
	2/16/2011	< 3	< 3	< 3	< 3
	2/16/2011	N/A	N/A	N/A	< 3
	7/7/2011	N/A	N/A	< 3	< 3
	10/27/2011	< 3	< 3	< 3	< 3
	4/26/2012	N/A	< 3	< 3	< 3
	10/9/2012	< 3	< 3	< 3	< 3
	10/9/2012	< 3	N/A	N/A	N/A
	2/20/2013	< 3	< 3	< 3	< 3
	2/20/2013	< 3	N/A	N/A	N/A
	10/3/2013	< 3	< 3	< 3	< 3
	10/3/2013	N/A	< 3	N/A	N/A
	4/22/2014	< 3	< 3	< 3	< 3
	10/14/2014	< 3	< 3	< 3	< 3
	5/12/2015	< 3	< 3	< 3	< 3
	5/12/2015	N/A	N/A	N/A	< 3
	7/29/2015	< 3	< 3	< 3	< 3
	7/29/2015	N/A	N/A	< 3	N/A
	2/15/2016	N/A	< 3	< 3	< 3
	3/28/2016	< 3	N/A	N/A	N/A
	10/31/2016	< 3	< 3	< 3	< 3
	3/27/2017	< 3	< 3	< 3	< 3
	3/27/2017	N/A	< 3	N/A	N/A
	11/13/2017	< 3	< 3	< 3	< 3
	6/6/2018	< 3	< 3	< 3	< 3
	11/26/2018	< 3	< 3	< 3	< 3
	3/18/2019	< 3	< 3	< 3	< 3
	3/18/2019	N/A	N/A	N/A	< 3
	12/2/2019	< 3	< 3	< 3	< 3
	12/2/2019	N/A	N/A	< 3	N/A
	3/30/2020	< 3	< 3	< 3	< 3
	3/30/2020	N/A	N/A	N/A	< 3
	11/17/2020	< 3	< 3	< 3	< 3
	11/17/2020	N/A	< 3	N/A	N/A
	5/6/2021	0.99*	< 3	< 3	1.49*
	5/6/2021	N/A	N/A	< 3	N/A
	10/7/2021	< 3	< 3	< 3	< 3
	10/7/2021	N/A	N/A	N/A	< 3
	4/6/2022	< 3	< 3	< 3	< 3
	4/6/2022	N/A	< 3	N/A	N/A
	8/23/2022	< 3	< 3	< 3	< 3
	8/23/2022	N/A	N/A	< 3	N/A
	3/8/2023	< 3	< 3	< 3	< 3
	3/8/2023	N/A	N/A	N/A	< 3
	9/13/2023	< 3	< 3	< 3	< 3
	9/13/2023	< 3	N/A	N/A	N/A

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Appendix I VOC Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
M&P-Xylene, ug/L (CAS NO - 179601-23-1)	10/9/2012	< 2	< 2	< 2	< 2
	10/9/2012	< 2	N/A	N/A	N/A
	2/20/2013	< 2	< 2	< 2	< 2
	2/20/2013	< 2	N/A	N/A	N/A
O-Xylene, ug/L (CAS NO - 95-47-6)	10/9/2012	< 1	< 1	< 1	< 1
	10/9/2012	< 1	N/A	N/A	N/A
	2/20/2013	< 1	< 1	< 1	< 1
	2/20/2013	< 1	N/A	N/A	N/A

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,1-Dichloropropene, ug/L (CAS NO - 563-58-6)	8/21/2009	N/A	< 1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 1	< 1
	2/15/2016	N/A	< 1	N/A	N/A
	3/27/2017	N/A	N/A	< 1	< 1
	5/6/2021	N/A	< 1	N/A	N/A
	4/6/2022	N/A	N/A	< 1	< 1
1,2,4,5-Tetrachlorobenzene, ug/L (CAS NO - 95-94-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
1,2,4-Trichlorobenzene, ug/L (CAS NO - 120-82-1)	8/21/2009	N/A	< 5	N/A	N/A
	8/31/2010	N/A	< 5	N/A	N/A
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	N/A	< 5	N/A	N/A
	10/9/2012	N/A	N/A	< 5	< 5
	2/15/2016	N/A	< 5	N/A	N/A
	3/27/2017	N/A	N/A	< 5	< 5
	5/6/2021	N/A	< 5	N/A	N/A
	4/6/2022	N/A	N/A	< 5	< 5
1,3,5-Trinitrobenzene, ug/L (CAS NO - 99-35-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
1,3-Dichlorobenzene, ug/L (CAS NO - 541-73-1)	8/21/2009	N/A	< 1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 1	< 1
	2/15/2016	N/A	< 1	N/A	N/A
	3/27/2017	N/A	N/A	< 1	< 1
	5/6/2021	N/A	< 1	N/A	N/A
	4/6/2022	N/A	N/A	< 1	< 1
1,3-Dichloropropane, ug/L (CAS NO - 142-28-9)	8/21/2009	N/A	< 1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 1	< 1
	2/15/2016	N/A	< 1	N/A	N/A
	3/27/2017	N/A	N/A	< 1	< 1
	5/6/2021	N/A	< 1	N/A	N/A
	4/6/2022	N/A	N/A	< 1	< 1
1,3-Dinitrobenzene, ug/L (CAS NO - 99-65-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
1,4-Naphthoquinone, ug/L (CAS NO - 130-15-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
1,4-Phenylenediamine, ug/L (CAS NO - 106-50-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
1-Naphthylamine, ug/L (CAS NO - 134-32-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,2-Dichloropropane, ug/L (CAS NO - 594-20-7)	8/21/2009	N/A	< 4	N/A	N/A
	8/31/2010	N/A	< 4	N/A	N/A
	7/7/2011	N/A	N/A	< 4	< 4
	10/27/2011	N/A	< 4	N/A	N/A
	10/9/2012	N/A	N/A	< 4	< 4
	2/15/2016	N/A	< 4	N/A	N/A
	3/27/2017	N/A	N/A	< 4	< 4
	5/6/2021	N/A	< 4	N/A	N/A
	4/6/2022	N/A	N/A	< 4	< 4
2,3,4,6-Tetrachlorophenol, ug/L (CAS NO - 58-90-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,4,5-T [2C], ug/L (CAS NO - 93-76-5)	8/21/2009	N/A	< 0.22	N/A	N/A
	8/31/2010	N/A	< 0.5	N/A	N/A
	7/7/2011	N/A	N/A	< 0.24	< 0.24
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 0.43	< 0.52
	2/15/2016	N/A	< 1.12	N/A	N/A
	3/27/2017	N/A	N/A	< 1.22	< 1.15
	5/6/2021	N/A	< 1.08	N/A	N/A
	4/6/2022	N/A	N/A	< 1.07	< 1.03
2,4,5-TP [Silvex] [2C], ug/L (CAS NO - 93-72-1)	8/21/2009	N/A	< 0.22	N/A	N/A
	8/31/2010	N/A	< 0.5	N/A	N/A
	7/7/2011	N/A	N/A	< 0.24	< 0.24
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 0.29	< 0.34
	2/15/2016	N/A	< 1.12	N/A	N/A
	3/27/2017	N/A	N/A	< 1.22	< 1.15
	5/6/2021	N/A	< 1.08	N/A	N/A
	4/6/2022	N/A	N/A	< 1.07	< 1.03

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
2,4,5-Trichlorophenol, ug/L (CAS NO - 95-95-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,4,6-Trichlorophenol, ug/L (CAS NO - 88-06-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,4-D [2C], ug/L (CAS NO - 94-75-7)	8/21/2009	N/A	< 1.1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 0.45	< 0.45
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 0.47	< 0.55
	2/15/2016	N/A	< 1.12	N/A	N/A
	3/27/2017	N/A	N/A	< 1.22	< 1.15
	5/6/2021	N/A	< 1.08	N/A	N/A
	4/6/2022	N/A	N/A	< 1.07	< 1.03
2,4-Dichlorophenol, ug/L (CAS NO - 120-83-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,4-Dimethylphenol, ug/L (CAS NO - 105-67-9)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,4-Dinitrophenol, ug/L (CAS NO - 51-28-5)	8/21/2009	N/A	< 20	N/A	N/A
	8/31/2010	N/A	< 20	N/A	N/A
	7/7/2011	N/A	N/A	< 20	< 20
	10/27/2011	N/A	< 20	N/A	N/A
	10/9/2012	N/A	N/A	< 20	< 20
	2/15/2016	N/A	< 21.1	N/A	N/A
	3/27/2017	N/A	N/A	< 20.4	< 20
	5/6/2021	N/A	< 21.5	N/A	N/A
	4/6/2022	N/A	N/A	< 21.7	< 20
2,4-Dinitrotoluene, ug/L (CAS NO - 121-14-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
2,6-Dichlorophenol, ug/L (CAS NO - 87-65-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2,6-Dinitrotoluene, ug/L (CAS NO - 606-20-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Acetylaminofluorene, ug/L (CAS NO - 53-96-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Chloronaphthalene, ug/L (CAS NO - 91-58-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Chlorophenol, ug/L (CAS NO - 95-57-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Methylnaphthalene, ug/L (CAS NO - 91-57-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Methylphenol, ug/L (CAS NO - 95-48-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
2-Naphthylamine, ug/L (CAS NO - 91-59-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Nitroaniline, ug/L (CAS NO - 88-74-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
2-Nitrophenol, ug/L (CAS NO - 88-75-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
3,3-Dichlorobenzidine, ug/L (CAS NO - 91-94-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 52.6	N/A	N/A
	3/27/2017	N/A	N/A	< 51	< 50
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
3,3-Dimethylbenzidine, ug/L (CAS NO - 119-93-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
3/4-Methylphenol, ug/L (CAS NO - T-34MP)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
3-Chloropropene, ug/L (CAS NO - 107-05-1)	8/21/2009	N/A	< 2	N/A	N/A
	8/31/2010	N/A	< 2	N/A	N/A
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	N/A	< 2	N/A	N/A
	10/9/2012	N/A	N/A	< 2	< 2
	2/15/2016	N/A	< 2	N/A	N/A
	3/27/2017	N/A	N/A	< 2	< 2
	5/6/2021	N/A	< 2	N/A	N/A
	4/6/2022	N/A	N/A	< 2	< 2

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
3-Methylcholanthrene, ug/L (CAS NO - 56-49-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
3-Nitroaniline, ug/L (CAS NO - 99-09-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4,4`-DDD, ug/L (CAS NO - 72-54-8)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
4,4`-DDE, ug/L (CAS NO - 72-55-9)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00227*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
4,4`-DDT, ug/L (CAS NO - 50-29-3)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00419*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
4,6-Dinitro-2-methylphenol, ug/L (CAS NO - 534-52-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4-Aminobiphenyl, ug/L (CAS NO - 92-67-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
4-Bromophenyl phenyl ether, ug/L (CAS NO - 101-55-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4-Chloro-3-methylphenol, ug/L (CAS NO - 59-50-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	0.288*	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4-Chloroaniline, ug/L (CAS NO - 106-47-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4-Chlorophenyl phenyl ether, ug/L (CAS NO - 7005-72-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4-Nitroaniline, ug/L (CAS NO - 100-01-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
4-Nitrophenol, ug/L (CAS NO - 100-02-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
5-Nitro-o-toluidine, ug/L (CAS NO - 99-55-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
7,12-Dimethylbenz [a] anthracene, ug/L (CAS NO - 57-97-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Acenaphthene, ug/L (CAS NO - 83-32-9)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Acenaphthylene, ug/L (CAS NO - 208-96-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Acetonitrile, ug/L (CAS NO - 75-05-8)	8/21/2009	N/A	< 10000	N/A	N/A
	8/31/2010	N/A	< 10000	N/A	N/A
	7/7/2011	N/A	N/A	< 10000	< 10000
	10/27/2011	N/A	< 10000	N/A	N/A
	10/9/2012	N/A	N/A	< 10000	< 10000
	2/15/2016	N/A	< 10000	N/A	N/A
	3/27/2017	N/A	N/A	< 10000	< 10000
	5/6/2021	N/A	< 10000	N/A	N/A
	4/6/2022	N/A	N/A	< 10000	< 10000
Acetophenone, ug/L (CAS NO - 98-86-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Acrolein, ug/L (CAS NO - 107-02-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10	N/A	N/A
	3/27/2017	N/A	N/A	< 10	< 10
	5/6/2021	N/A	< 10	N/A	N/A
	4/6/2022	N/A	N/A	< 10	< 10
Aldrin, ug/L (CAS NO - 309-00-2)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Anthracene, ug/L (CAS NO - 120-12-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Benzo [a] anthracene, ug/L (CAS NO - 56-55-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Benzo [a] pyrene, ug/L (CAS NO - 50-32-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Benzo [b] fluoranthene, ug/L (CAS NO - 205-99-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Benzo [g,h,i] perylene, ug/L (CAS NO - 191-24-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Benzo [k] fluoranthene, ug/L (CAS NO - 207-08-9)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Benzyl alcohol, ug/L (CAS NO - 100-51-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	0.462*
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Alpha-BHC, ug/L (CAS NO - 319-84-6)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00937*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Beta-BHC, ug/L (CAS NO - 319-85-7)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Delta-BHC, ug/L (CAS NO - 319-86-8)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Gamma-BHC [Lindane], ug/L (CAS NO - 58-89-9)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00339*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Bis[2-chloroethoxy]methane, ug/L (CAS NO - 111-91-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Bis[2-chloroethyl]ether, ug/L (CAS NO - 111-44-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Bis[2-chloroisopropyl]ether, ug/L (CAS NO - 108-60-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Bis[2-ethylhexyl]phthalate, ug/L (CAS NO - 117-81-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	2.5*	N/A	N/A
	3/27/2017	N/A	N/A	1.86*	1.8*
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Butyl benzyl phthalate, ug/L (CAS NO - 85-68-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Chlordane, ug/L (CAS NO - 57-74-9)	8/21/2009	N/A	< 2	N/A	N/A
	8/31/2010	N/A	< 2	N/A	N/A
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	N/A	< 2	N/A	N/A
	10/9/2012	N/A	N/A	< 2	< 2
	2/15/2016	N/A	< 2.08	N/A	N/A
	3/27/2017	N/A	N/A	< 2	< 2
	5/6/2021	N/A	< 2.2	N/A	N/A
	4/6/2022	N/A	N/A	< 2.08	< 2.17
Alpha-Chlordane, ug/L (CAS NO - 5103-71-9)	10/9/2012	N/A	N/A	< 0.032	< 0.032
Gamma-Chlordane, ug/L (CAS NO - 5566-34-7)	10/9/2012	N/A	N/A	< 0.032	< 0.032
Chlorobenzilate, ug/L (CAS NO - 510-15-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Chloroprene, ug/L (CAS NO - 126-99-8)	8/21/2009	N/A	< 1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 1	< 1
	2/15/2016	N/A	< 1	N/A	N/A
	3/27/2017	N/A	N/A	< 1	< 1
	5/6/2021	N/A	< 1	N/A	N/A
	4/6/2022	N/A	N/A	< 1	< 1
Chrysene, ug/L (CAS NO - 218-01-9)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Cyanide, mg/L (CAS NO - 57-12-5)	8/21/2009	N/A	< 0.01	N/A	N/A
	8/31/2010	N/A	< 0.01	N/A	N/A
	7/7/2011	N/A	N/A	< 0.01	< 0.01
	10/27/2011	N/A	< 0.01	N/A	N/A
	10/9/2012	N/A	N/A	< 0.01	< 0.01
	2/15/2016	N/A	0.0042*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.01	< 0.01
	5/6/2021	N/A	< 0.01	N/A	N/A
	4/6/2022	N/A	N/A	< 0.01	< 0.01

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Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Diallate [cis or trans], ug/L (CAS NO - 2303-16-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Dibenz [a,h] anthracene, ug/L (CAS NO - 53-70-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Dibenzofuran, ug/L (CAS NO - 132-64-9)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Dichlorodifluoromethane, ug/L (CAS NO - 75-71-8)	8/21/2009	N/A	< 3	N/A	N/A
	8/31/2010	N/A	< 3	N/A	N/A
	7/7/2011	N/A	N/A	< 3	< 3
	10/27/2011	N/A	< 3	N/A	N/A
	10/9/2012	N/A	N/A	< 3	< 3
	2/15/2016	N/A	< 3	N/A	N/A
	3/27/2017	N/A	N/A	< 3	< 3
	5/6/2021	N/A	< 3	N/A	N/A
	4/6/2022	N/A	N/A	< 3	< 3
Dieldrin, ug/L (CAS NO - 60-57-1)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00259*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Diethyl phthalate, ug/L (CAS NO - 84-66-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Dimethoate, ug/L (CAS NO - 60-51-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Dimethyl phthalate, ug/L (CAS NO - 131-11-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Dimethylaminoazobenzene, ug/L (CAS NO - 60-11-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Di-n-butyl phthalate, ug/L (CAS NO - 84-74-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	0.82*	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	0.583*
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Di-n-octyl phthalate, ug/L (CAS NO - 117-84-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	2.36*	N/A	N/A
	3/27/2017	N/A	N/A	< 20.4	< 20
	5/6/2021	N/A	< 21.5	N/A	N/A
	4/6/2022	N/A	N/A	< 21.7	< 20
Dinoseb, ug/L (CAS NO - 88-85-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Diphenylamine, ug/L (CAS NO - 122-39-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Disulfoton, ug/L (CAS NO - 298-04-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Endosulfan I, ug/L (CAS NO - 959-98-8)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00337*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Endosulfan II, ug/L (CAS NO - 33213-65-9)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Endosulfan sulfate, ug/L (CAS NO - 1031-07-8)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00391*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Endrin, ug/L (CAS NO - 72-20-8)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.0147*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	0.0682*
Endrin aldehyde, ug/L (CAS NO - 7421-93-4)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.0152*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Ethyl Methacrylate, ug/L (CAS NO - 97-63-2)	8/21/2009	N/A	< 2	N/A	N/A
	8/31/2010	N/A	< 2	N/A	N/A
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	N/A	< 2	N/A	N/A
	10/9/2012	N/A	N/A	< 2	< 2
	2/15/2016	N/A	< 2	N/A	N/A
	3/27/2017	N/A	N/A	< 2	< 2
	5/6/2021	N/A	< 2	N/A	N/A
	4/6/2022	N/A	N/A	< 2	< 2
Ethyl Methanesulfonate, ug/L (CAS NO - 62-50-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Famphur, ug/L (CAS NO - 52-85-7)	8/21/2009	N/A	< 20	N/A	N/A
	8/31/2010	N/A	< 20	N/A	N/A
	7/7/2011	N/A	N/A	< 20	< 20
	10/27/2011	N/A	< 20	N/A	N/A
	10/9/2012	N/A	N/A	< 20	< 20
	2/15/2016	N/A	< 21.1	N/A	N/A
	3/27/2017	N/A	N/A	< 20.4	< 20
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Fluoranthene, ug/L (CAS NO - 206-44-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Fluorene, ug/L (CAS NO - 86-73-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Heptachlor, ug/L (CAS NO - 76-44-8)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	0.00941*	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Heptachlor Epoxide, ug/L (CAS NO - 1024-57-3)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Hexachlorobenzene, ug/L (CAS NO - 118-74-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Hexachlorobutadiene, ug/L (CAS NO - 87-68-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Hexachlorocyclopentadiene, ug/L (CAS NO - 77-47-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 21.1	N/A	N/A
	3/27/2017	N/A	N/A	< 20.4	< 20
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Hexachloroethane, ug/L (CAS NO - 67-72-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Hexachloropropene, ug/L (CAS NO - 1888-71-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Indeno [1,2,3-cd] pyrene, ug/L (CAS NO - 193-39-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Isobutanol, mg/L (CAS NO - 78-83-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10	N/A	N/A
	3/27/2017	N/A	N/A	< 10	< 10
	5/6/2021	N/A	< 10	N/A	N/A
	4/6/2022	N/A	N/A	< 10	< 10
Isodrin, ug/L (CAS NO - 465-73-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Isophorone, ug/L (CAS NO - 78-59-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Isosafrole, ug/L (CAS NO - 120-58-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Kepone, ug/L (CAS NO - 143-50-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Methacrylonitrile, ug/L (CAS NO - 126-98-7)	8/21/2009	N/A	< 1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 1	< 1
	10/27/2011	N/A	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 2	< 2
	2/15/2016	N/A	< 10	N/A	N/A
	3/27/2017	N/A	N/A	< 10	< 10
	5/6/2021	N/A	< 10	N/A	N/A
	4/6/2022	N/A	N/A	< 10	< 10
Methapyrilene, ug/L (CAS NO - 91-80-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Methoxychlor, ug/L (CAS NO - 72-43-5)	8/21/2009	N/A	< 0.032	N/A	N/A
	8/31/2010	N/A	< 0.032	N/A	N/A
	7/7/2011	N/A	N/A	< 0.032	< 0.032
	10/27/2011	N/A	< 0.032	N/A	N/A
	10/9/2012	N/A	N/A	< 0.032	< 0.032
	2/15/2016	N/A	< 0.0333	N/A	N/A
	3/27/2017	N/A	N/A	< 0.032	< 0.032
	5/6/2021	N/A	< 0.0352	N/A	N/A
	4/6/2022	N/A	N/A	< 0.0667	< 0.0696
Methyl Methacrylate, ug/L (CAS NO - 80-62-6)	8/21/2009	N/A	< 2	N/A	N/A
	8/31/2010	N/A	< 2	N/A	N/A
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	N/A	< 2	N/A	N/A
	10/9/2012	N/A	N/A	< 2	< 2
	2/15/2016	N/A	< 2	N/A	N/A
	3/27/2017	N/A	N/A	< 2	< 2
	5/6/2021	N/A	< 2	N/A	N/A
	4/6/2022	N/A	N/A	< 2	< 2
Methyl Methanesulfonate, ug/L (CAS NO - 66-27-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Naphthalene, ug/L (CAS NO - 91-20-3)	8/21/2009	N/A	< 5	N/A	N/A
	8/31/2010	N/A	< 5	N/A	N/A
	7/7/2011	N/A	N/A	< 5	< 5
	10/27/2011	N/A	< 5	N/A	N/A
	10/9/2012	N/A	N/A	< 5	< 5
	2/15/2016	N/A	< 5	N/A	N/A
	3/27/2017	N/A	N/A	< 5	< 5
	5/6/2021	N/A	< 5	N/A	N/A
	4/6/2022	N/A	N/A	< 5	< 5
Nitrobenzene, ug/L (CAS NO - 98-95-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosodiethylamine, ug/L (CAS NO - 55-18-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosodimethylamine, ug/L (CAS NO - 62-75-9)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosodi-n-butylamine, ug/L (CAS NO - 924-16-3)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosodi-n-propylamine, ug/L (CAS NO - 621-64-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosodiphenylamine, ug/L (CAS NO - 86-30-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
N-Nitrosomethylethylamine, ug/L (CAS NO - 10595-95-6)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosopiperidine, ug/L (CAS NO - 100-75-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
N-Nitrosopyrrolidine, ug/L (CAS NO - 930-55-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
O,O,O-Triethyl Phosphorothioate, ug/L (CAS NO - 126-68-1)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
O-Toluidine, ug/L (CAS NO - 95-53-4)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Parathion-Ethyl, ug/L (CAS NO - 56-38-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Parathion-Methyl, ug/L (CAS NO - 298-00-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
PCB-1016, ug/L (CAS NO - 12674-11-2)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	< 0.8
	2/15/2016	N/A	< 0.86	N/A	N/A
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87
PCB-1221, ug/L (CAS NO - 11104-28-2)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	< 0.8
	2/15/2016	N/A	< 0.86	N/A	N/A
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87
PCB-1232, ug/L (CAS NO - 11141-16-5)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	< 0.8
	2/15/2016	N/A	< 0.86	N/A	N/A
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87
PCB-1242, ug/L (CAS NO - 53469-21-9)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	< 0.8
	2/15/2016	N/A	< 0.86	N/A	N/A
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87
PCB-1248, ug/L (CAS NO - 12672-29-6)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	< 0.8
	2/15/2016	N/A	< 0.86	N/A	N/A
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87
PCB-1254, ug/L (CAS NO - 11097-69-1)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	< 0.8
	2/15/2016	N/A	< 0.86	N/A	N/A
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87

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Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
PCB-1260, ug/L (CAS NO - 11096-82-5)	8/21/2009	N/A	< 0.8	N/A	N/A
	8/31/2010	N/A	< 0.8	N/A	N/A
	7/7/2011	N/A	N/A	< 0.8	< 0.8
	10/27/2011	N/A	< 0.8	N/A	N/A
	10/9/2012	N/A	N/A	< 0.8	**0.965**
	2/20/2013	N/A	N/A	N/A	< 0.8
	10/3/2013	N/A	N/A	N/A	< 0.842
	12/18/2013	N/A	N/A	N/A	< 0.842
	4/22/2014	N/A	N/A	N/A	< 0.816
	10/14/2014	N/A	N/A	N/A	< 0.816
	5/12/2015	N/A	N/A	N/A	< 0.825
	7/29/2015	N/A	N/A	N/A	< 0.808
	2/15/2016	N/A	< 0.86	N/A	< 0.833
	10/31/2016	N/A	N/A	N/A	< 0.87
	3/27/2017	N/A	N/A	< 0.851	< 0.816
	11/13/2017	N/A	N/A	N/A	< 0.816
	5/6/2021	N/A	< 0.879	N/A	N/A
	4/6/2022	N/A	N/A	< 0.833	< 0.87
Pentachlorobenzene, ug/L (CAS NO - 608-93-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Pentachloronitrobenzene, ug/L (CAS NO - 82-68-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Pentachlorophenol [2C], ug/L (CAS NO - 87-86-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Phenacetin, ug/L (CAS NO - 62-44-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Phenanthrene, ug/L (CAS NO - 85-01-8)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Phenol, ug/L (CAS NO - 108-95-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Phorate, ug/L (CAS NO - 298-02-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Pronamide, ug/L (CAS NO - 23950-58-5)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Propionitrile, ug/L (CAS NO - 107-12-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10	N/A	N/A
	3/27/2017	N/A	N/A	< 10	< 10
	5/6/2021	N/A	< 10	N/A	N/A
	4/6/2022	N/A	N/A	< 10	< 10
Pyrene, ug/L (CAS NO - 129-00-0)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Safrole, ug/L (CAS NO - 94-59-7)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10

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Summary of Groundwater Chemistry

Cass County Sanitary Landfill DS - 15-SDP-01-75P

Other Constituents	Sample Date	MW-22 UPG	MW-11 DNG	MW-23 DNG	MW-36 DNG
Sulfide, mg/L (CAS NO - 18496-25-8)	8/21/2009	N/A	< 1	N/A	N/A
	8/31/2010	N/A	< 1	N/A	N/A
	7/7/2011	N/A	N/A	< 0.12	< 0.12
	10/27/2011	< 1	< 1	N/A	N/A
	10/9/2012	N/A	N/A	< 0.23	< 0.23
	5/15/2013	< 1	< 1	N/A	< 1
	4/22/2014	< 1	N/A	N/A	N/A
	7/10/2014	< 1	N/A	N/A	N/A
	10/14/2014	< 1	N/A	N/A	N/A
	5/12/2015	< 1	N/A	N/A	N/A
	2/15/2016	N/A	< 1	N/A	N/A
	10/31/2016	< 1	N/A	N/A	N/A
	3/27/2017	N/A	N/A	< 1	< 1
	5/6/2021	N/A	21.2	N/A	N/A
	10/7/2021	< 1	< 10	N/A	N/A
	4/6/2022	N/A	N/A	0.781*	< 1
Thionazin, ug/L (CAS NO - 297-97-2)	8/21/2009	N/A	< 10	N/A	N/A
	8/31/2010	N/A	< 10	N/A	N/A
	7/7/2011	N/A	N/A	< 10	< 10
	10/27/2011	N/A	< 10	N/A	N/A
	10/9/2012	N/A	N/A	< 10	< 10
	2/15/2016	N/A	< 10.5	N/A	N/A
	3/27/2017	N/A	N/A	< 10.2	< 10
	5/6/2021	N/A	< 10.8	N/A	N/A
	4/6/2022	N/A	N/A	< 10.9	< 10
Toxaphene, ug/L (CAS NO - 8001-35-2)	8/21/2009	N/A	< 2	N/A	N/A
	8/31/2010	N/A	< 2	N/A	N/A
	7/7/2011	N/A	N/A	< 2	< 2
	10/27/2011	N/A	< 2	N/A	N/A
	10/9/2012	N/A	N/A	< 2	< 2
	2/15/2016	N/A	< 2.08	N/A	N/A
	3/27/2017	N/A	N/A	< 2	< 2
	5/6/2021	N/A	< 2.2	N/A	N/A
	4/6/2022	N/A	N/A	< 2.08	< 2.17

Note: * indicates 'J flag'. Detection is below the reporting limit, but greater than the MDL (Method Detection Limit). The concentration is estimated.

Denotes Detection.
Denotes Confirmed Outlier. Statistically Excluded.

Sampling performed over multiple dates is recorded on the first date sampled. Refer to field forms for exact sample date.

Appendix D

Statistical Method and Output

Statistical Method and Output

Purpose

The purpose of this document is to provide the statistical evaluation methodology for groundwater analytical data collected from the groundwater monitoring network of the Cass County Sanitary Landfill (Landfill) municipal solid waste landfill (MSWLF) unit.

Statistical Method

Diagnostic and Exploratory Evaluations and Tests of Assumptions

Both the detection and assessment/corrective action monitoring statistical programs include diagnostic and exploratory evaluations and statistical tests of assumptions, as appropriate, including the following:

- Time Series Plots
- Shapiro-Wilk test for normality
- Ohio Environmental Protection Agency (EPA) Method for identification of outliers
- Mann-Kendall/Sen's Slope for trends

Management of Non-Detect Data

Non-detect values in the dataset are managed using simple substitution or the Kaplan-Meier estimator. If less than 15% of the data are non-detects, simple substitution is used, where non-detect values are assigned a concentration of one-half (½) of the practical quantification limit (PQL). If greater than 15% but less than 50% of the data are non-detects, the Kaplan-Meier estimator is used to define the distribution of the dataset. If non-detects comprise greater than 50% of the available data, non-parametric statistical methods are used.

Management of Outliers

Background datasets are evaluated for outliers using the Ohio EPA Method included in the Sanitas™ statistical software program and described below, which includes the use of Dixon's, Rosner's, and Tukey's outlier tests, as appropriate based on the diagnostic tests, for the datasets that contain less than 75% of the measured concentrations below the PQL. Outliers are not confirmed unless a physical cause or explanation for the outlier is determined.

Management of Data (ND data < 75%)

If less than 75% of the background dataset was below the PQL, outliers are statistically evaluated using the following guidelines.

- A parametric dataset with $n < 20$ is evaluated with the Dixon's outlier test.
- A parametric dataset with $n \geq 20$ is evaluated with the Rosner's outlier test.
- A non-parametric dataset is evaluated with the Tukey's outlier test.

In accordance with the Ohio EPA Method, if a statistically significant outlier is not found using the above tests, but the highest value data point exceeds the second highest data point by an order of magnitude, the highest point is considered an outlier.

Management of Data (ND data ≥ 75%)

If greater than or equal to 75% of the background dataset is less than the PQL, outliers are statistically evaluated using the following guidelines.

- Single detection ≥ the PQL:
  - If ≥ 50% of the background dataset has detections ≥ the method detection limit (MDL), any value ≥ two times the PQL of background is considered an outlier.
  - If < 50% of the background dataset has detections ≥ the MDL, any value ≥ the PQL of background is considered an outlier.
- Two or more detections ≥ the PQL:
  - If ≥ 50% of the background dataset has detections ≥ the MDL, any value ≥ three times the PQL of background is considered an outlier.
  - If < 50% of the background dataset has detections ≥ the MDL, any value ≥ two times the PQL of background is considered an outlier.

Confirmed outliers, if any, are shown in the Summary of Groundwater Chemistry included in the Annual Water Quality Report.

Detection Monitoring Statistical Program

The detection monitoring statistical program for the Landfill unit is defined by Iowa Administrative Code (IAC) 567-113.10(4)"g". Interwell prediction limits with retesting were selected as the appropriate statistical method for the determination of statistically significant increases (SSIs) over background for inorganic constituents with historical detections. Prediction limits are established using the process below. Data from the most recent sampling event is compared to the prediction limits for the determination of SSIs.

Interwell Prediction Limits with Retesting

- If the dataset has a normal distribution (or can be transformed to a normal distribution using Ladder of Powers), parametric interwell prediction limits are calculated if at least five samples have been collected from the background monitoring point(s).
- If the dataset does not have a normal distribution (and cannot be transformed to a normal distribution using Ladder of Powers) or has greater than 50% non-detects, nonparametric interwell prediction limits were calculated if at least five samples have been collected from the background monitoring point(s).
- If an SSI above the prediction limit is indicated, retesting samples using the 1-of-2 retesting scheme are collected before the next regularly scheduled sampling event with temporal sample spacing consideration to provide samples with greater independence. If the retesting result exceeds the prediction limit, the SSI is confirmed, and the monitoring point is placed into the assessment monitoring program. If the retesting sample concentration is below the prediction limit, the SSI is not confirmed, and the monitoring point continues in the detection monitoring program.

Double Quantification Method

The quasi-statistical "double quantification" method is used for constituents not detected in the background monitoring point(s). If a constituent is detected in the compliance dataset that has not been historically detected in the background dataset, that constituent must be retested before the next regularly scheduled sampling event. If the retesting results confirm the original detection with a quantifiable detection, the SSI is confirmed, and the monitoring point is placed into the assessment monitoring program.

Assessment Monitoring/Corrective Action Statistical Program

Confidence intervals or confidence bands, as appropriate, were selected as the appropriate statistical methods for comparison of the groundwater analytical data against a fixed groundwater protection standard (GWPS). The assessment/corrective action monitoring statistical evaluations are performed using the most recent eight samples or all samples if less than eight samples are available. The confidence intervals or confidence bands used for the assessment/corrective action monitoring statistical evaluation are established using the process below. Transformation of the distribution is not considered.

Confidence Intervals or Confidence Bands

- A parametric confidence interval around a normal mean is calculated if the dataset has a normal distribution and no statistically significant trend is present.
- A non-parametric confidence interval around a median is calculated if the dataset does not have a normal distribution and no statistically significant trend is present.
- Non-parametric confidence bands around a Theil-Sen trend line are calculated if the dataset has a statistically significant trend.

If the lower confidence limit or any part of the lower confidence band, as appropriate, exceeds the GWPS, then the monitoring point is declared out of compliance, and an assessment of corrective measures (ACM) is required. An Assessment of Corrective Measures Report was submitted on June 30, 2020 (Doc #97998) and approved in permit correspondence dated September 21, 2020 (Doc #98498).

Statistical Software Output

Sanitas™ statistical software was used to perform the statistical evaluations. The statistical output for the 1st and 2nd 2023 statistical evaluations are included in Attachments A and B of this appendix, respectively.

Attachment A

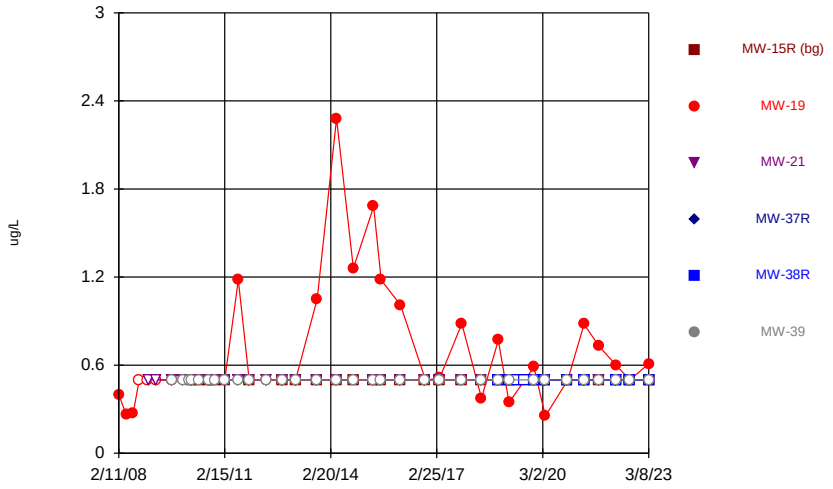
1st 2023 Statistical Evaluation Output

Time Series Plots –

Water Table

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

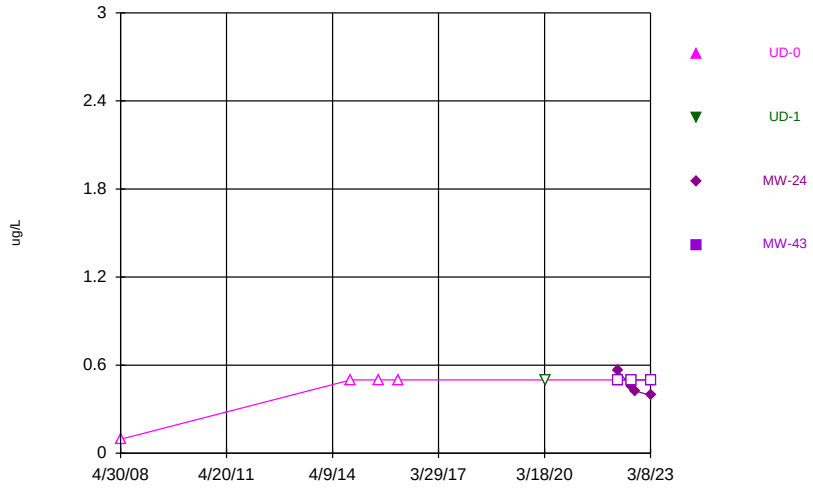
Time Series



Constituent: 1,1-Dichloroethane Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



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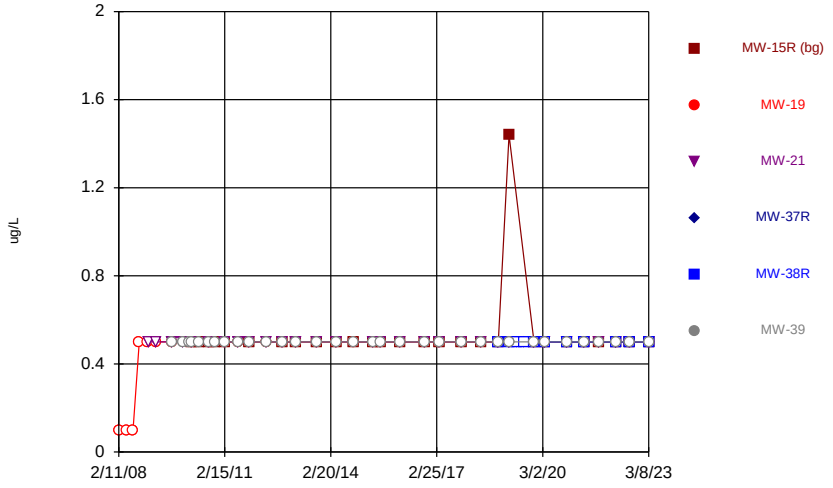
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



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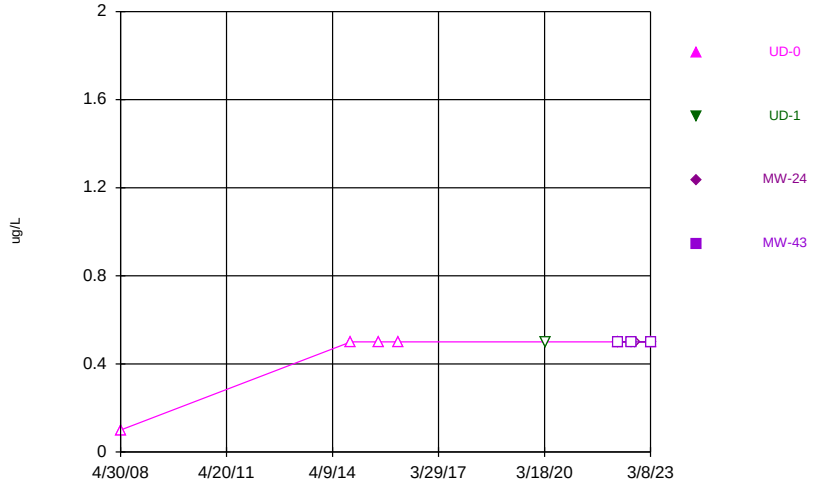
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



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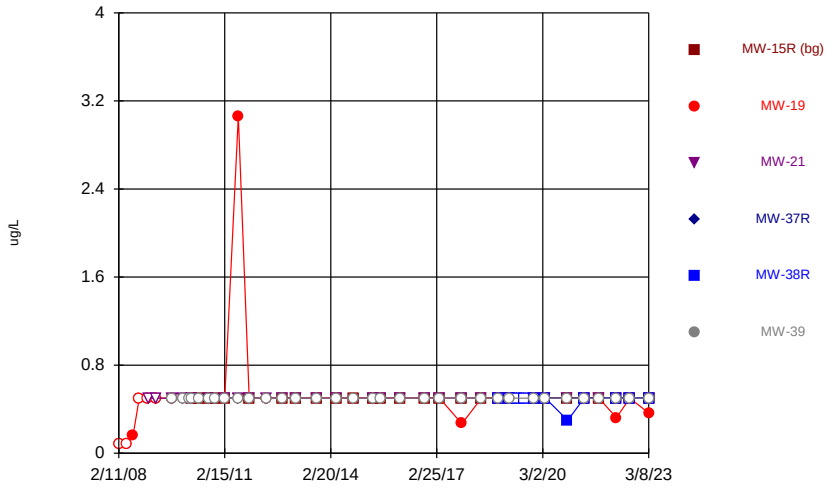
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

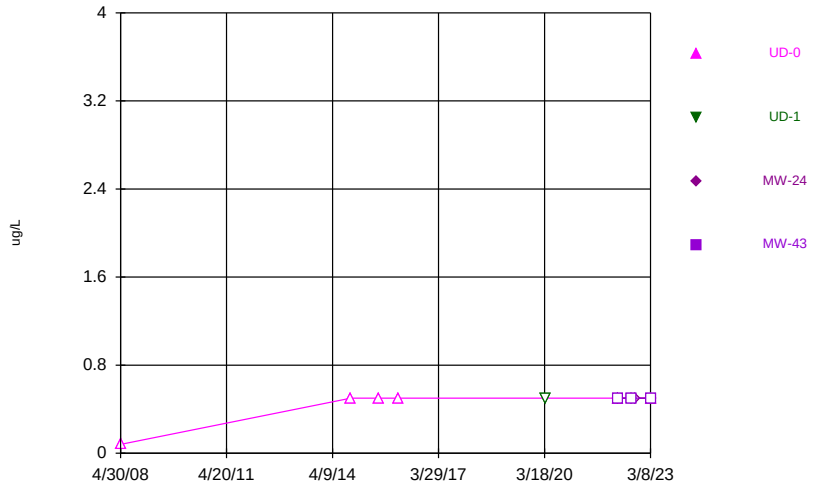
Time Series



Constituent: 1,4-Dichlorobenzene Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

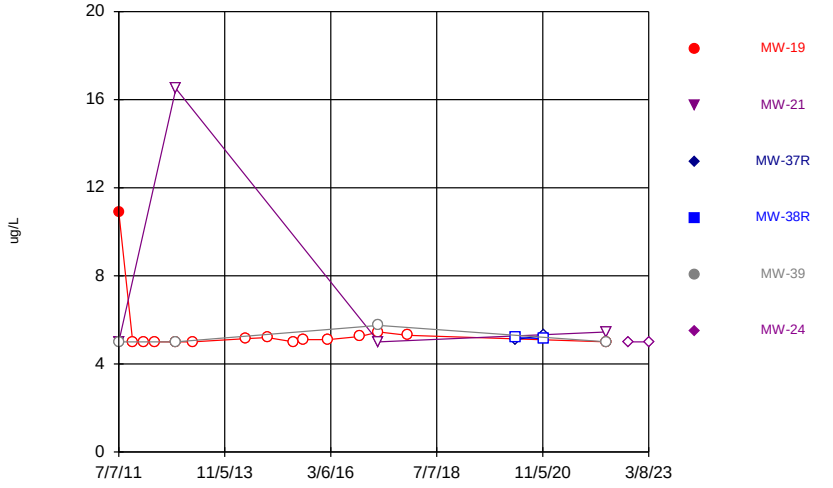
Time Series



Constituent: 1,4-Dichlorobenzene Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: 4-Chloro-3-methylphenol Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series W
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

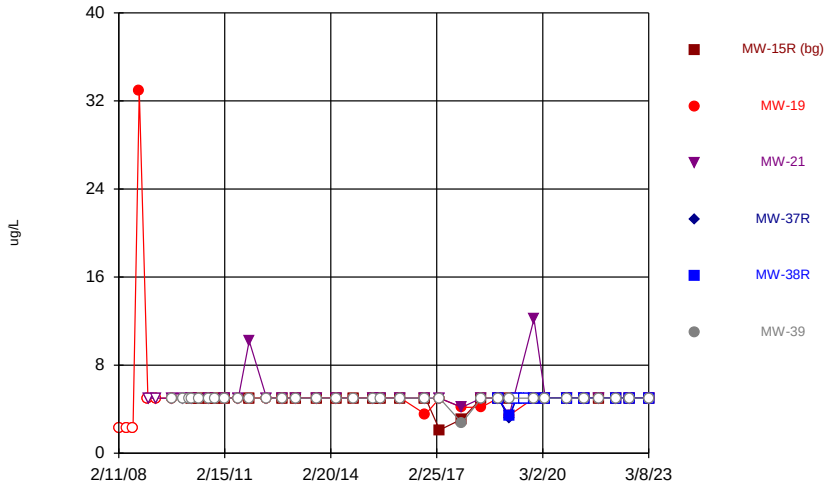
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series

Constituent: 4-Chloro-3-methylphenol Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series W
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

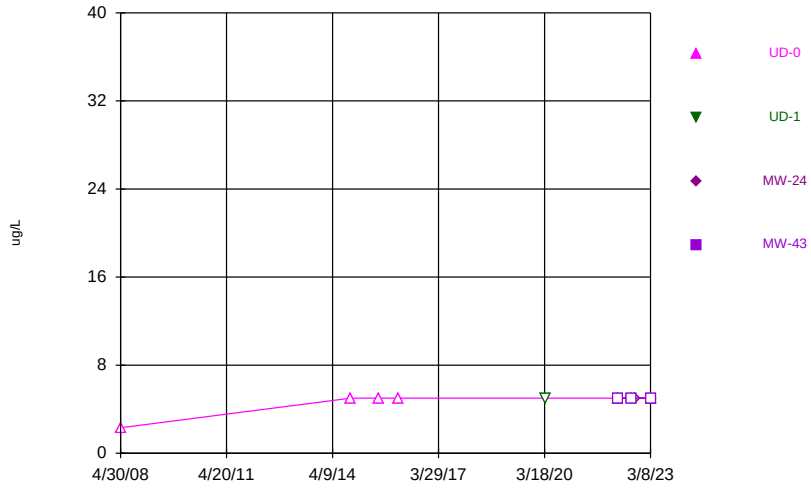
Time Series



Constituent: Acetone Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



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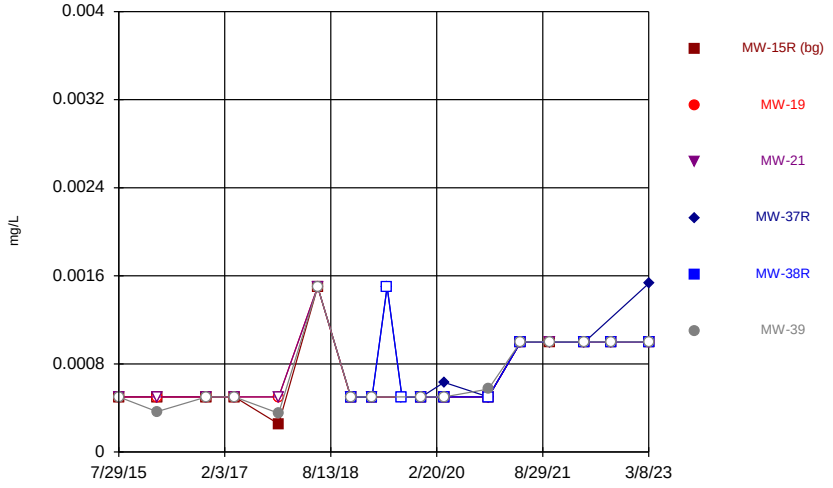
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

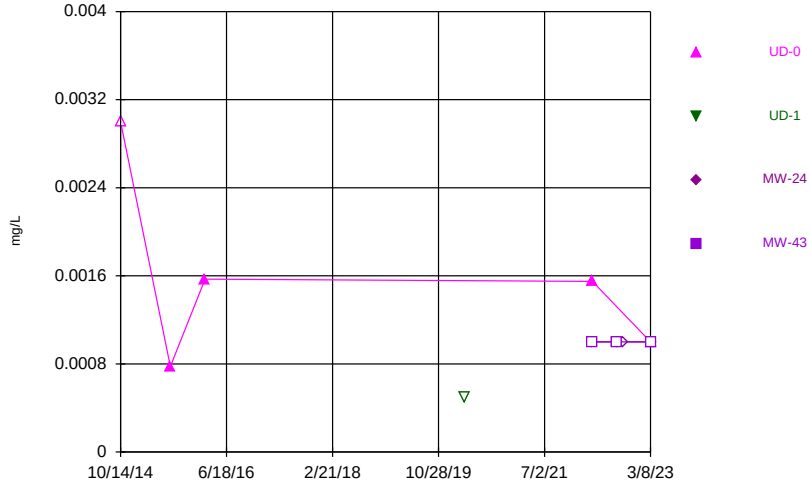
Time Series



Constituent: Antimony Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

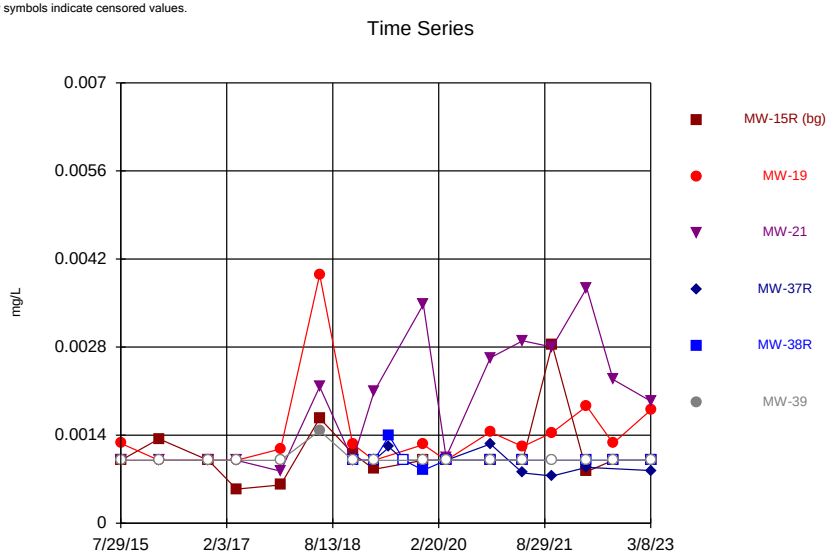
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



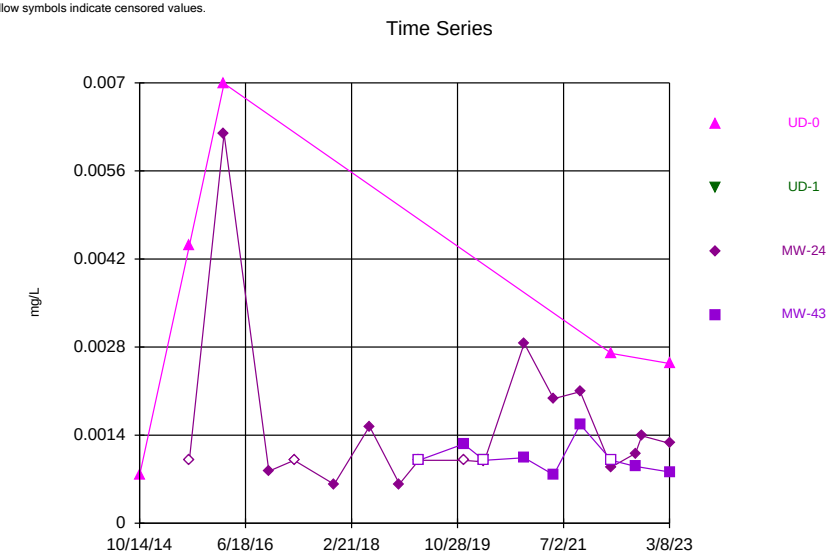
Constituent: Antimony Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



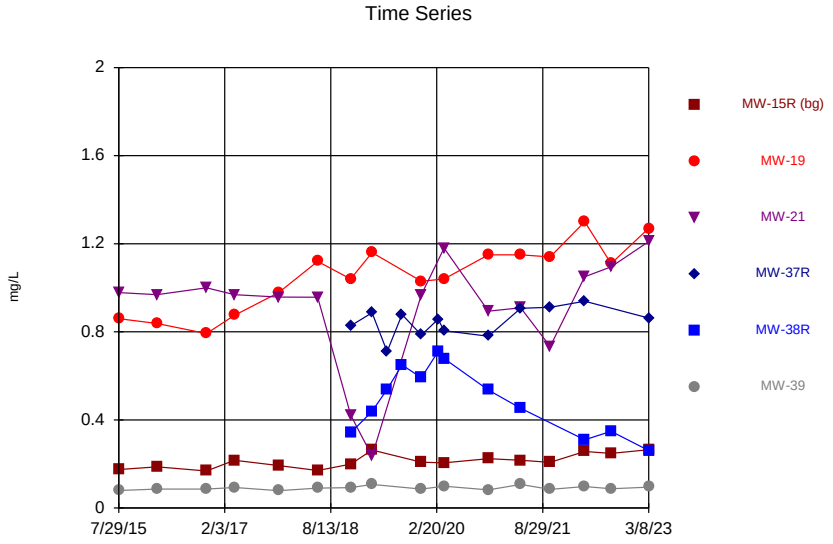
Constituent: Arsenic Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



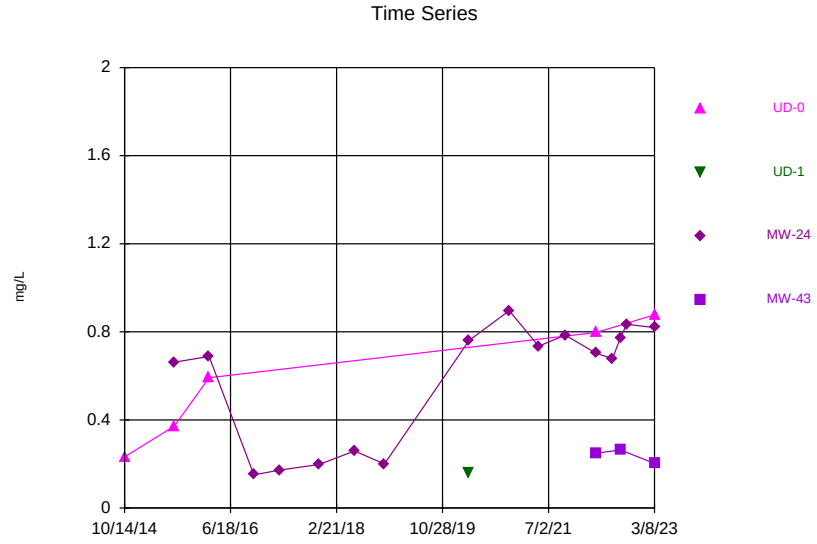
Constituent: Arsenic Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG



Constituent: Barium Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

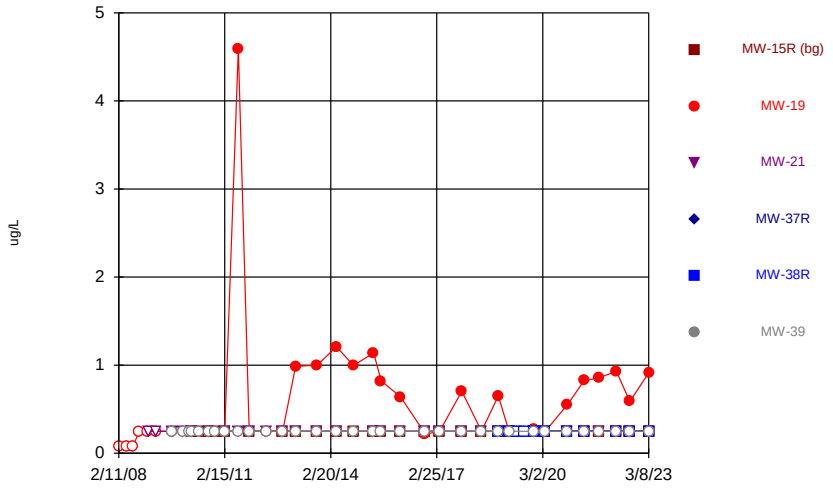
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG



Constituent: Barium Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

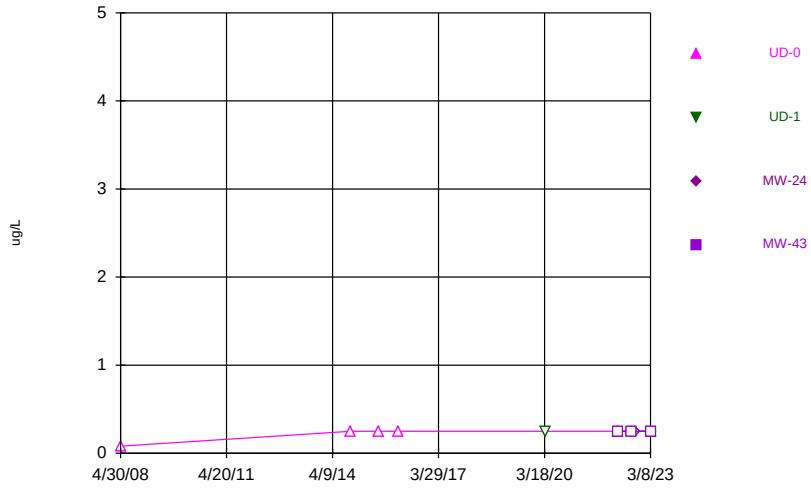
Time Series



Constituent: Benzene Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

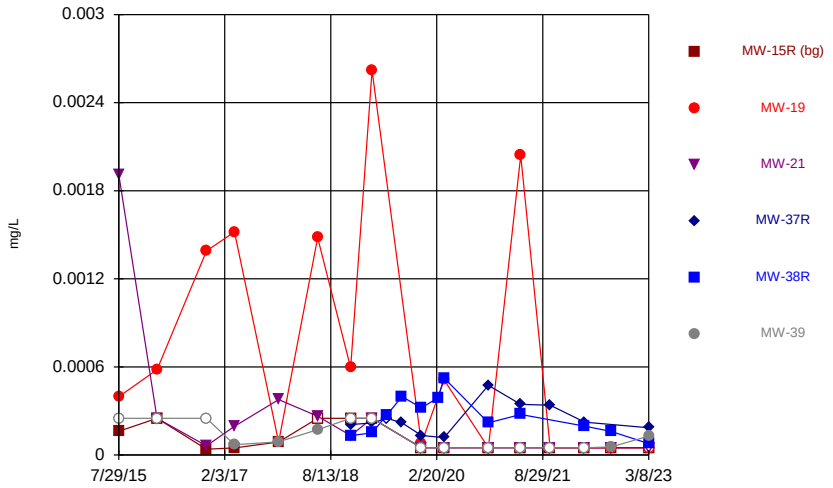
Time Series



Constituent: Benzene Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

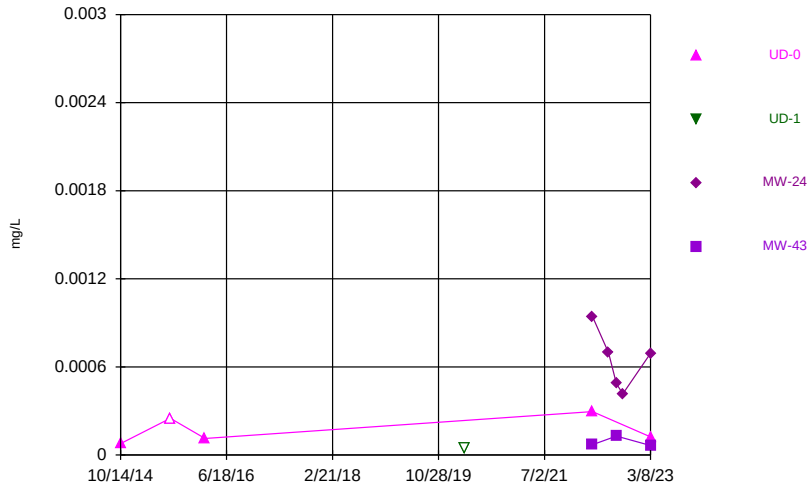
Time Series



Constituent: Cadmium Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

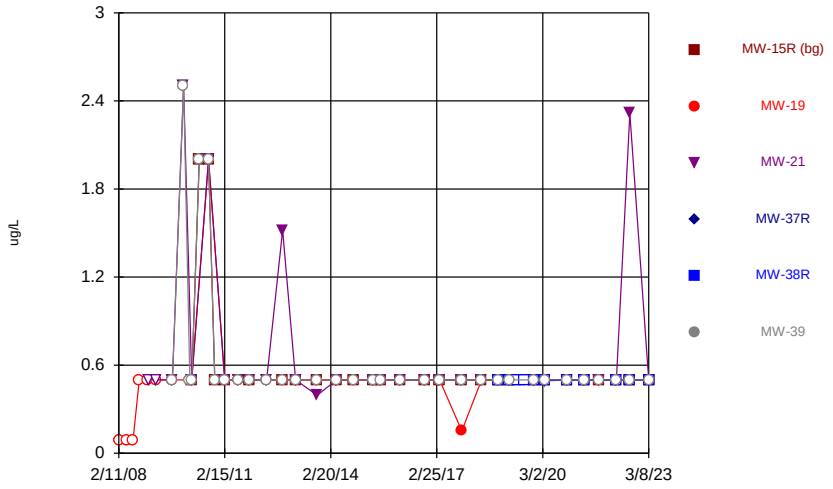
Time Series



Constituent: Cadmium Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

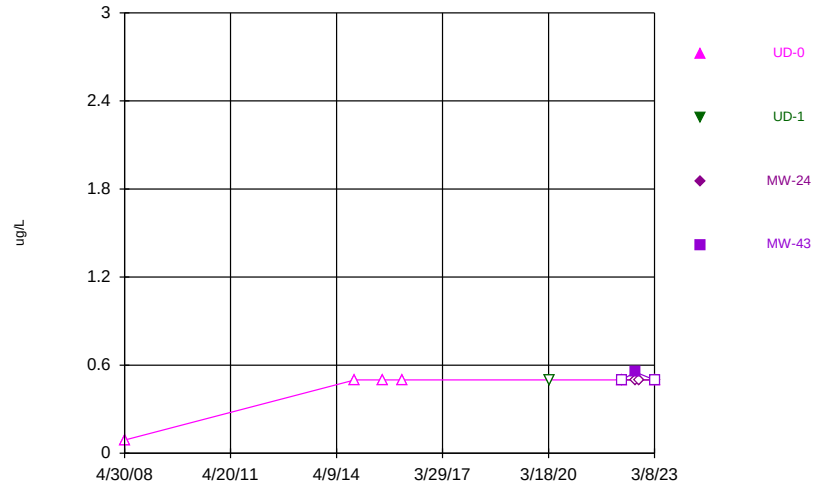
Time Series



Constituent: Carbon Disulfide Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

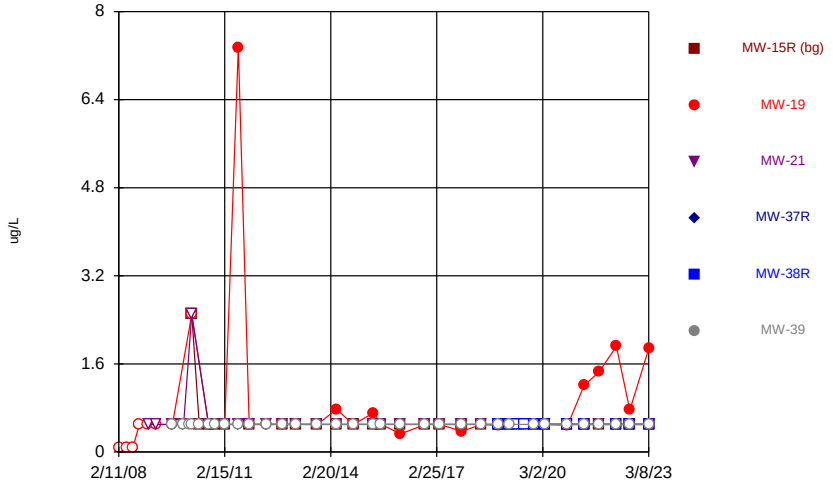
Time Series



Constituent: Carbon Disulfide Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

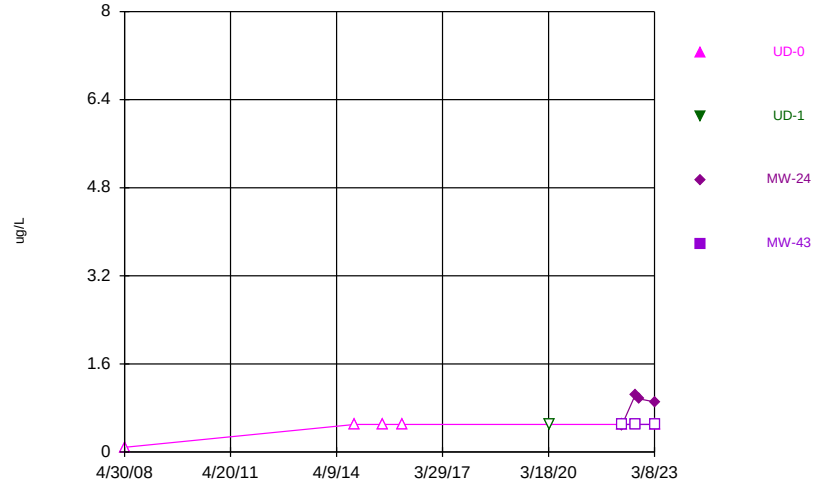
Time Series



Constituent: Chlorobenzene Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

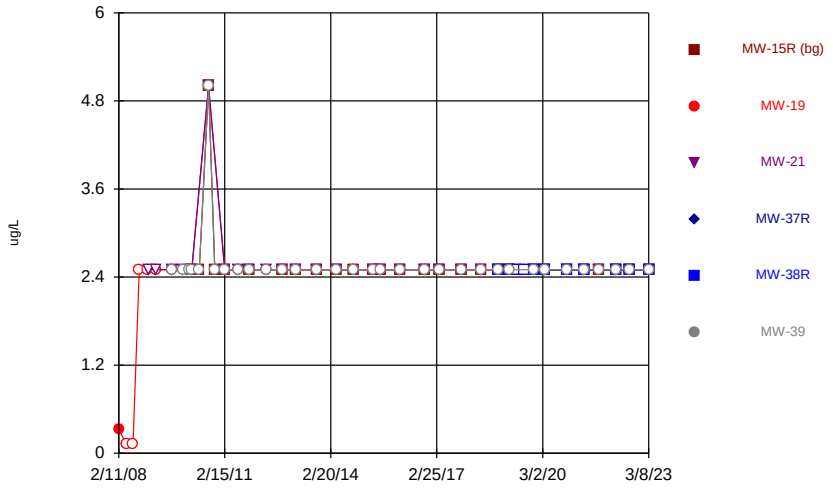
Time Series



Constituent: Chlorobenzene Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

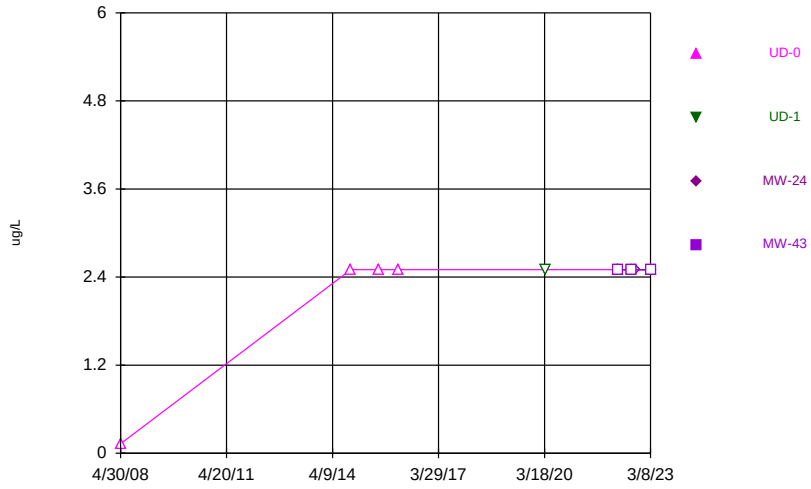
Time Series



Constituent: Chlorodibromomethane Analysis Run 5/11/2023 11:48 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

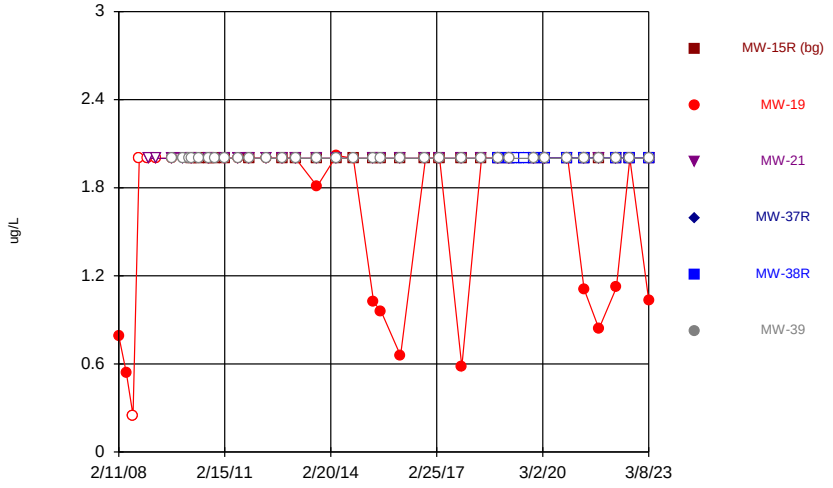
Time Series



Constituent: Chlorodibromomethane Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

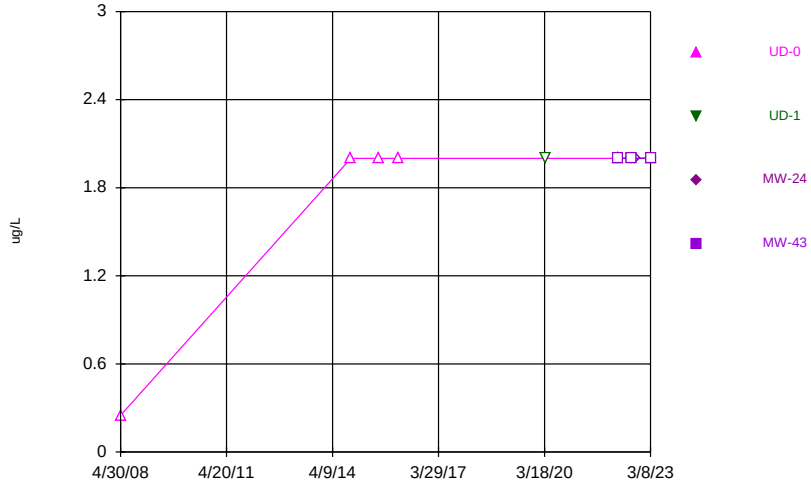
Time Series



Constituent: Chloroethane Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

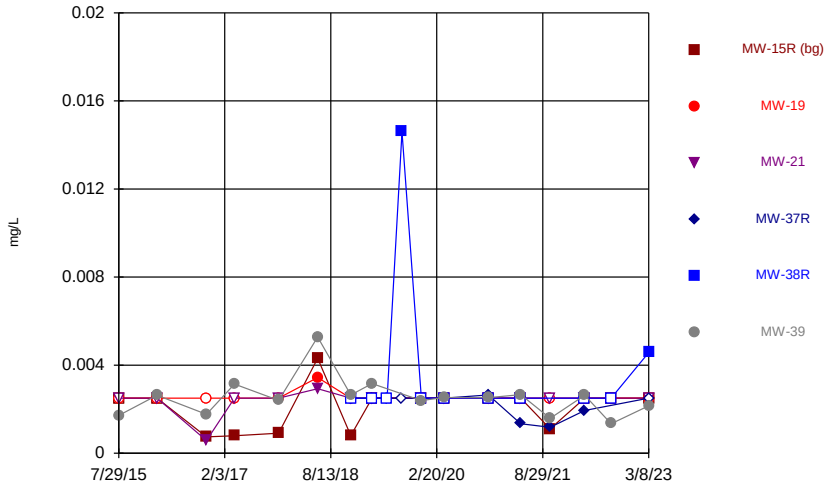
Time Series



Constituent: Chloroethane Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

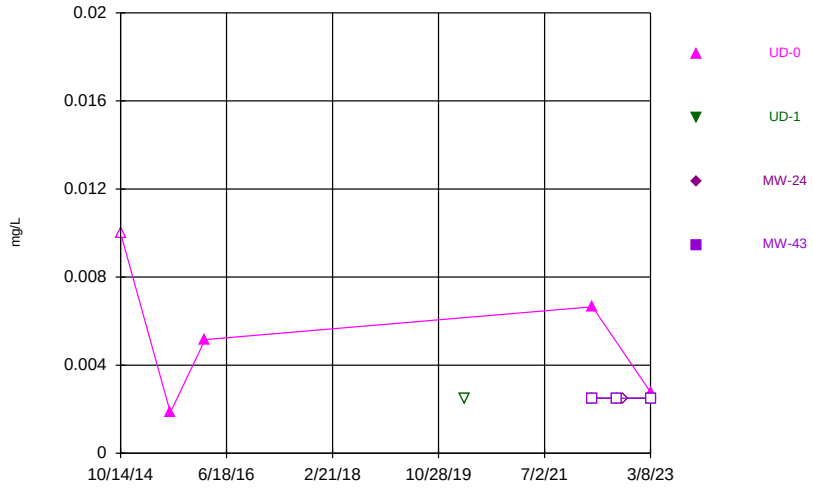
Time Series



Constituent: Chromium Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

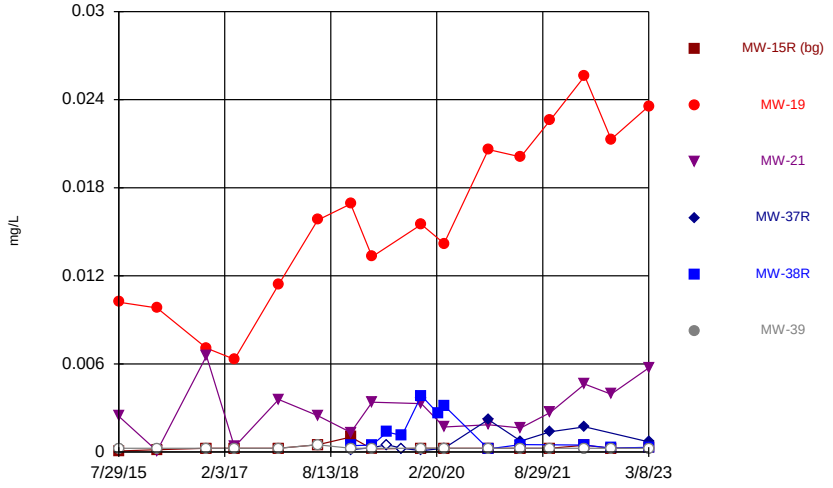
Time Series



Constituent: Chromium Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

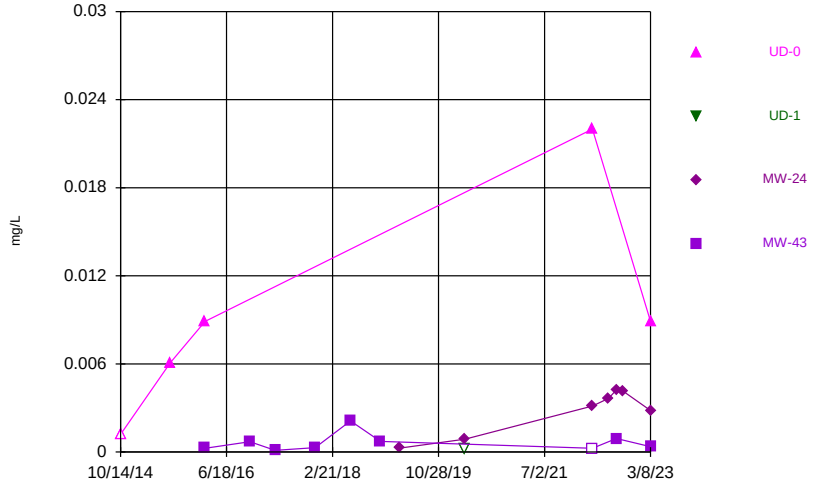
Time Series



Constituent: Cobalt Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

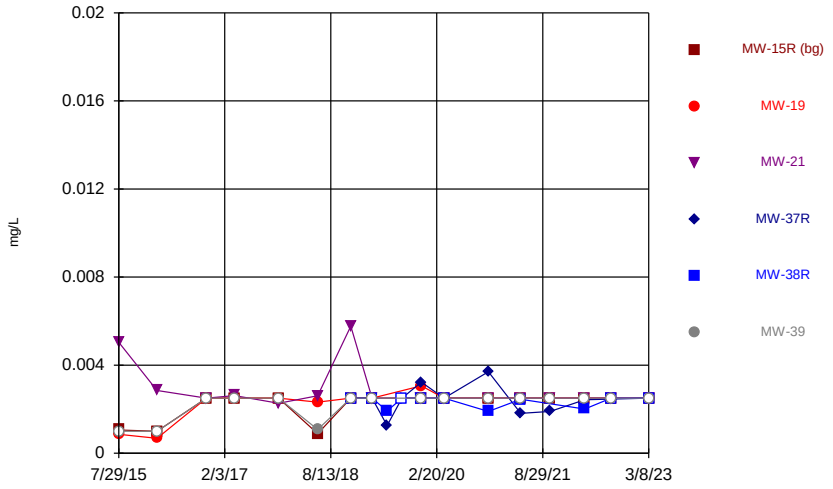
Time Series



Constituent: Cobalt Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

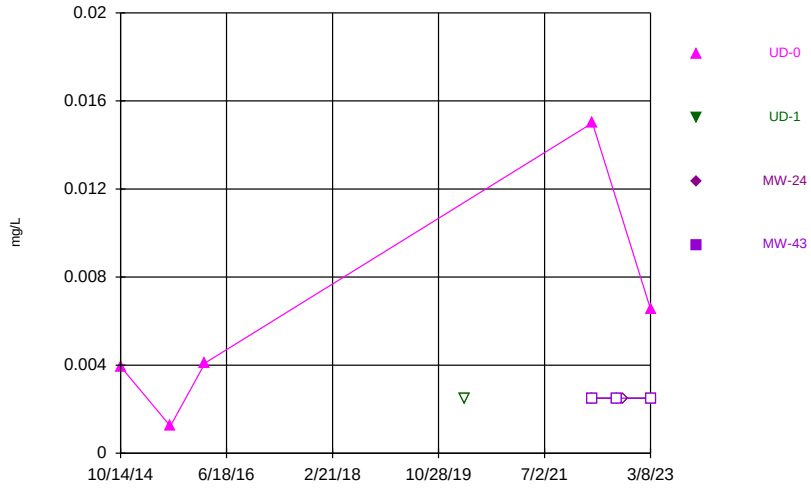
Time Series



Constituent: Copper Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Copper Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

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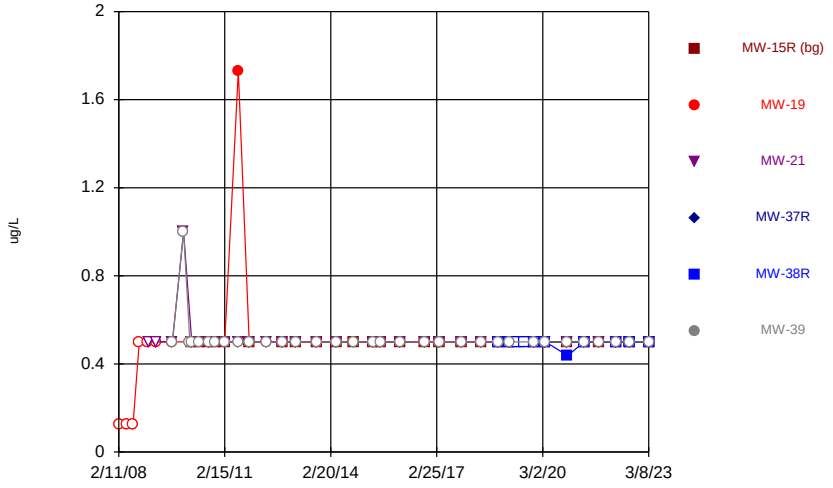
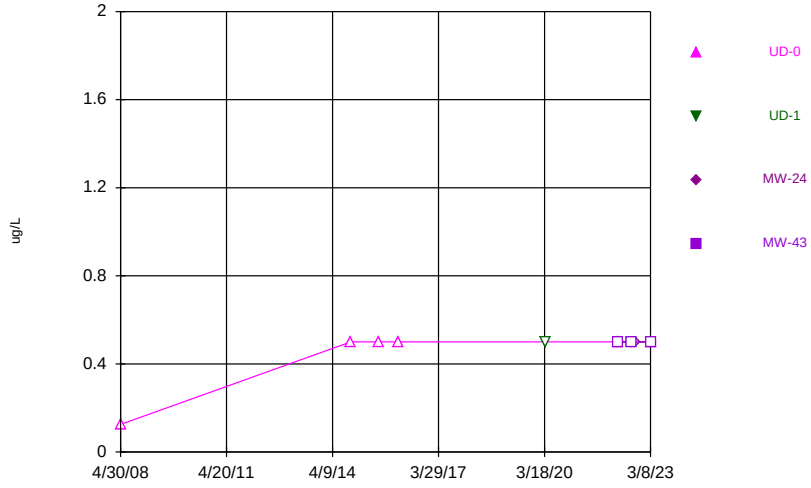


Constituent: Ethylbenzene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

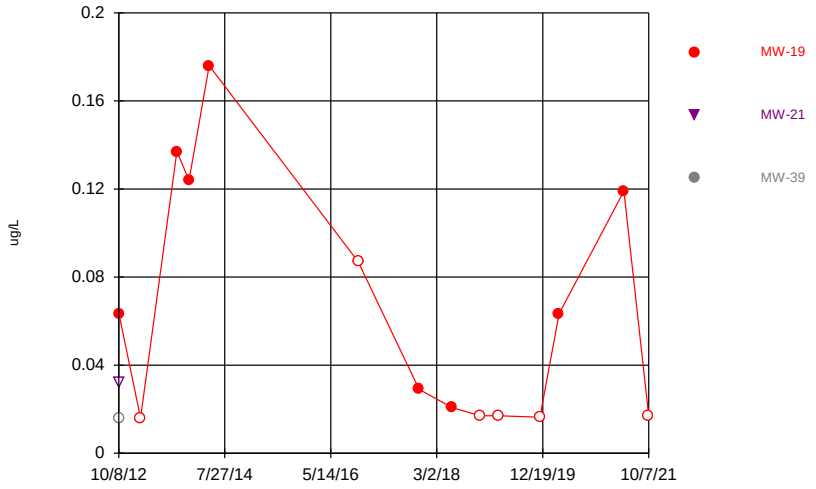
Time Series



Constituent: Ethylbenzene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

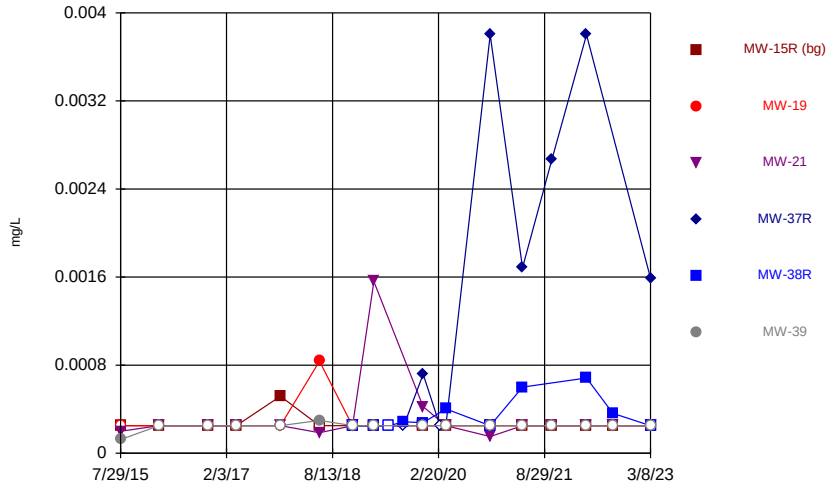
Time Series



Constituent: gamma-Chlordane Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Lead Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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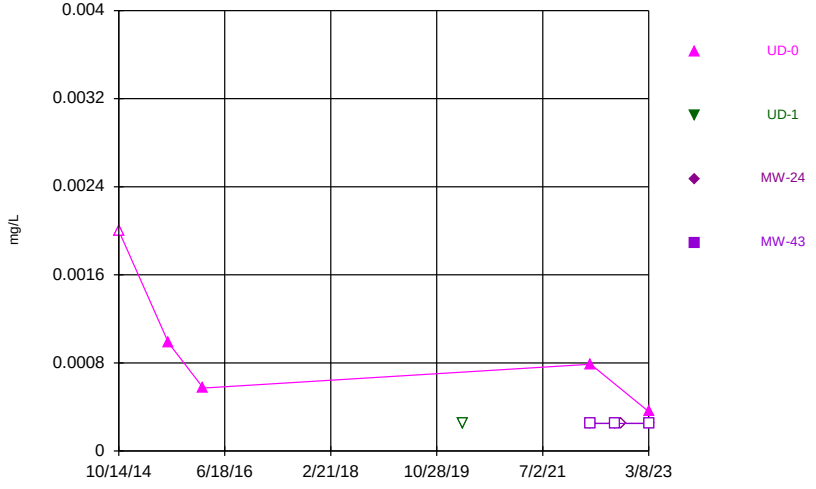
Time Series



Constituent: Lead Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

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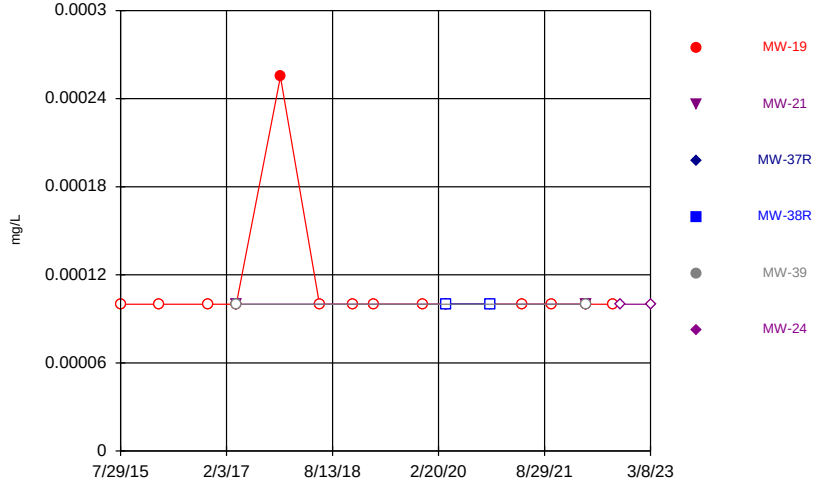
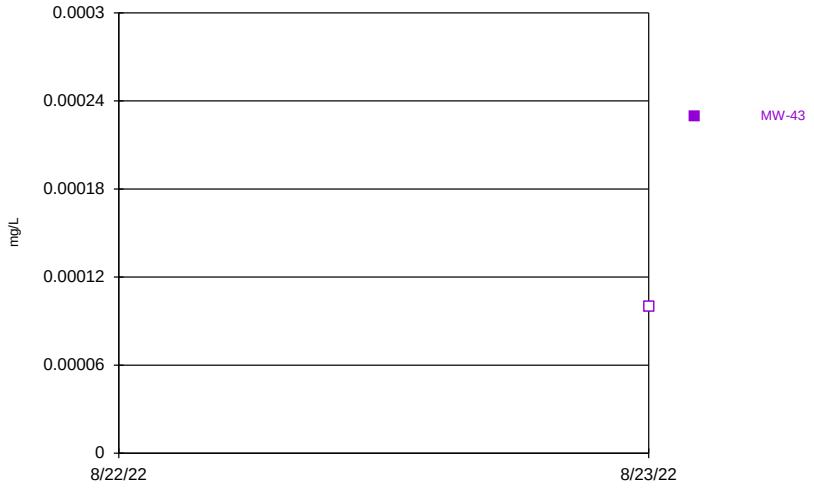


Constituent: Mercury Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Mercury Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

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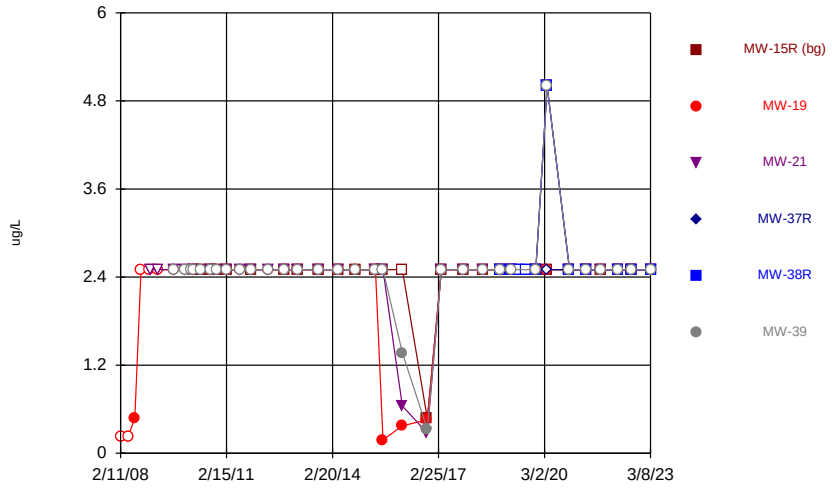
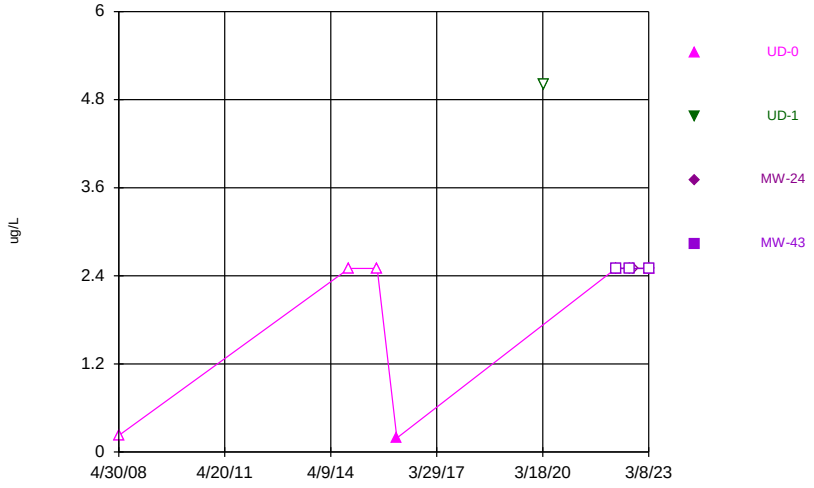


Constituent: Methylene Chloride Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

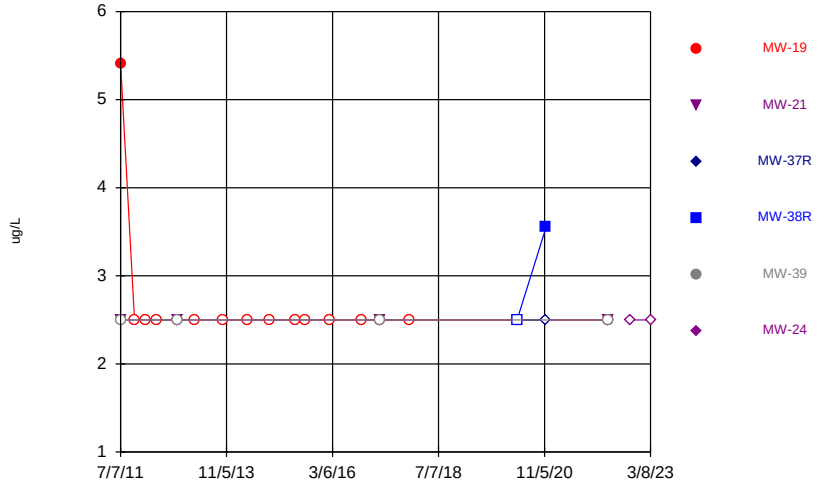
Time Series



Constituent: Methylene Chloride Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

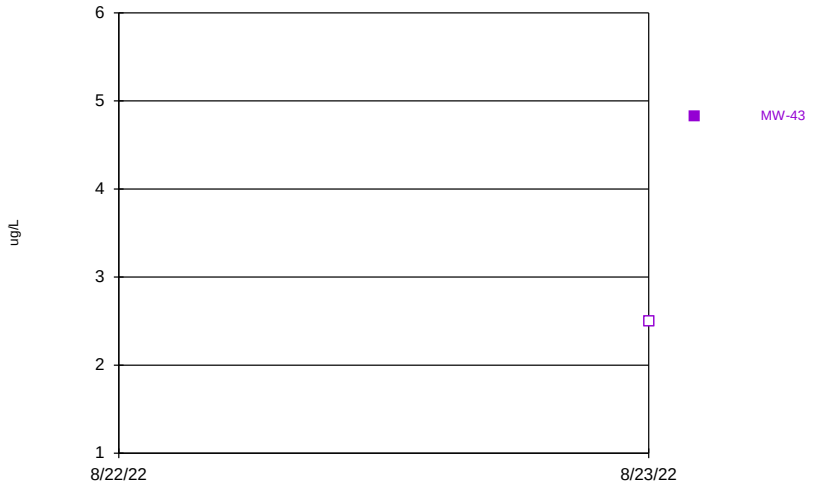
Time Series



Constituent: Naphthalene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

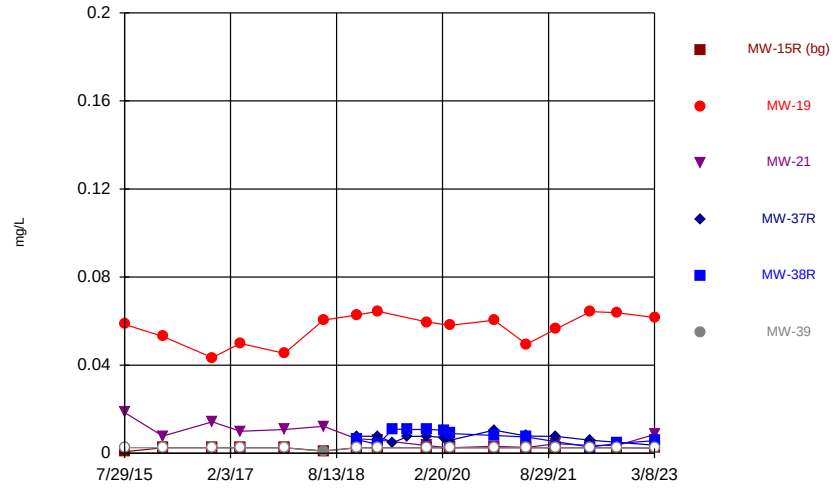
Time Series



Constituent: Naphthalene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

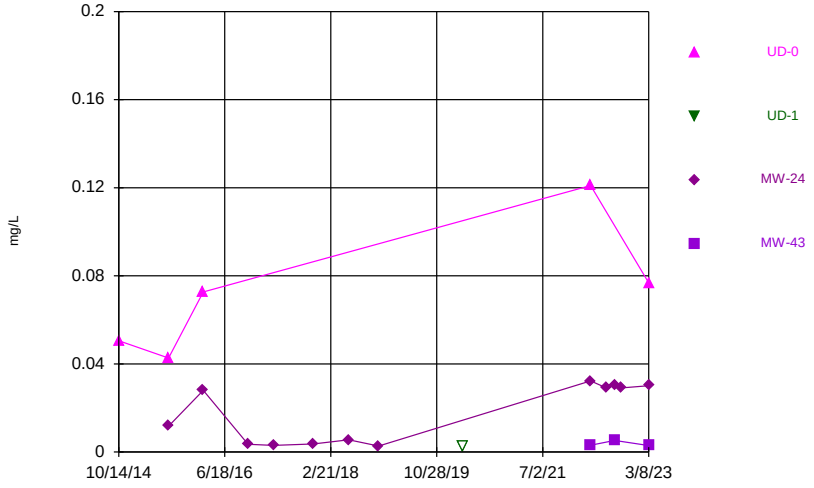
Time Series



Constituent: Nickel Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

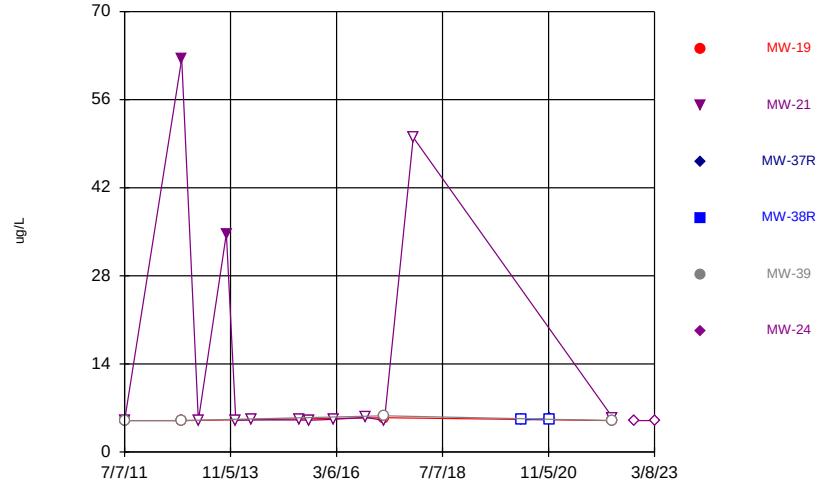
Time Series



Constituent: Nickel Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Phenol Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

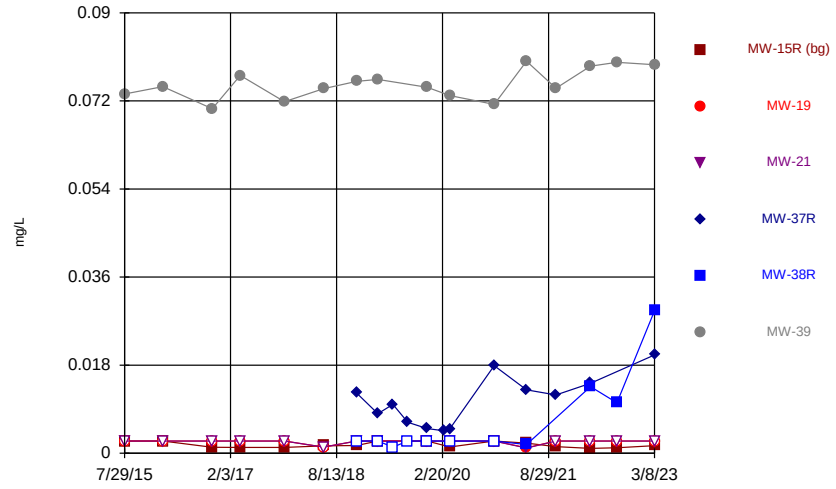
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series

Constituent: Phenol Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

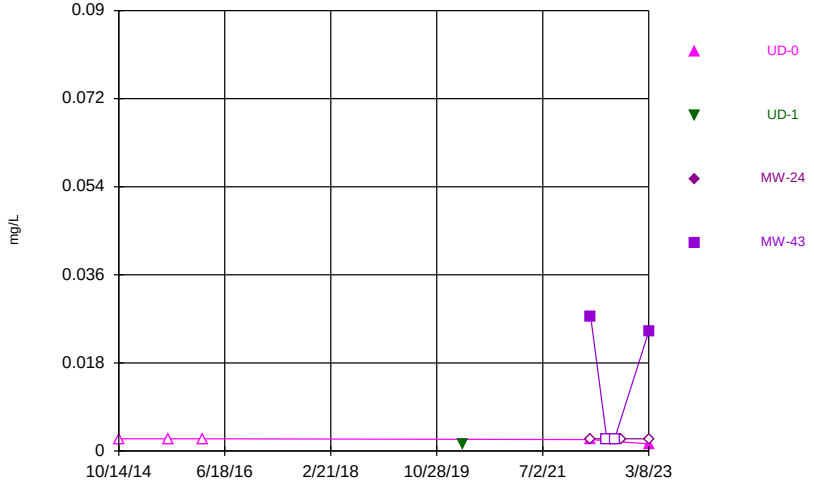
Time Series



Constituent: Selenium Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

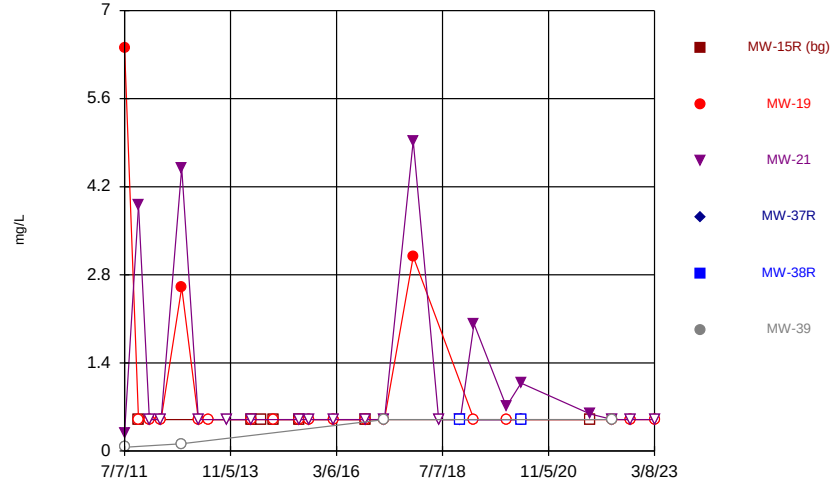
Time Series



Constituent: Selenium Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

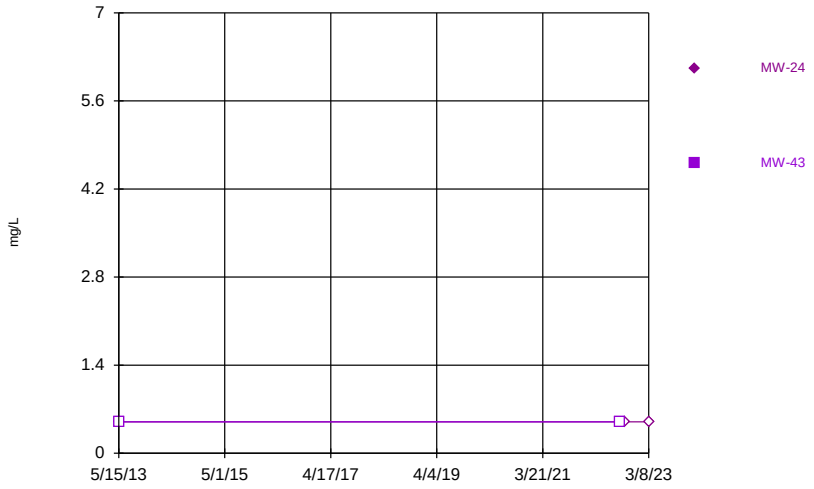
Time Series



Constituent: Sulfide Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

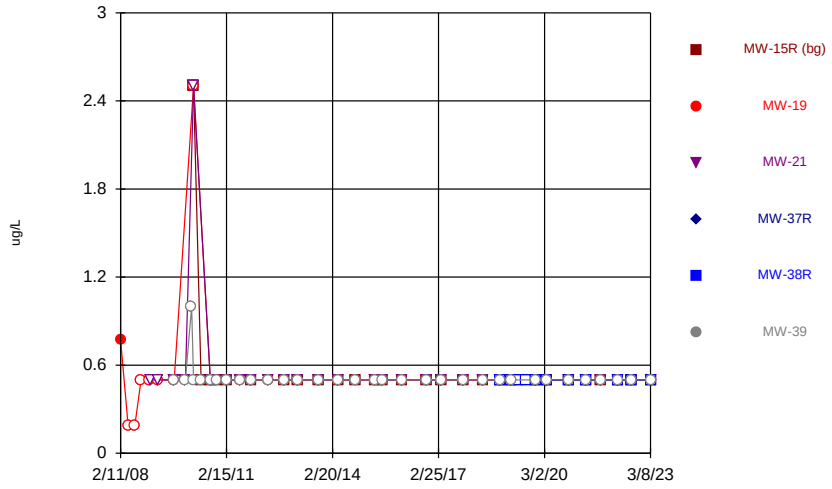
Time Series



Constituent: Sulfide Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

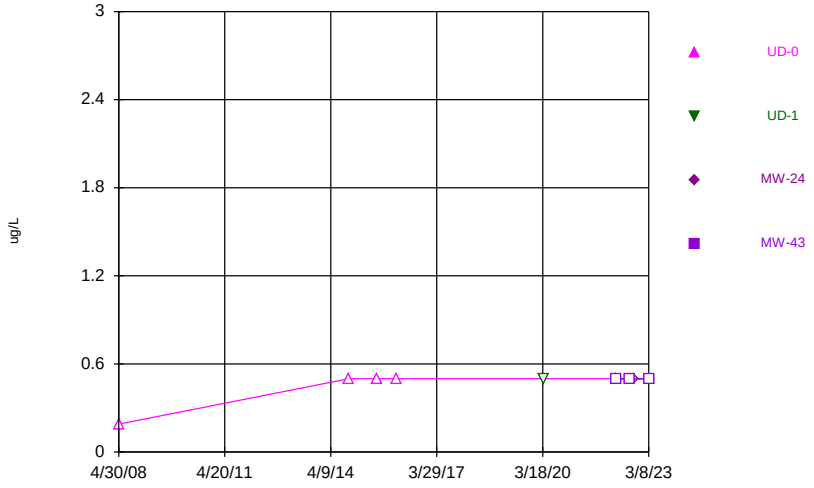
Time Series



Constituent: Tetrachloroethene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

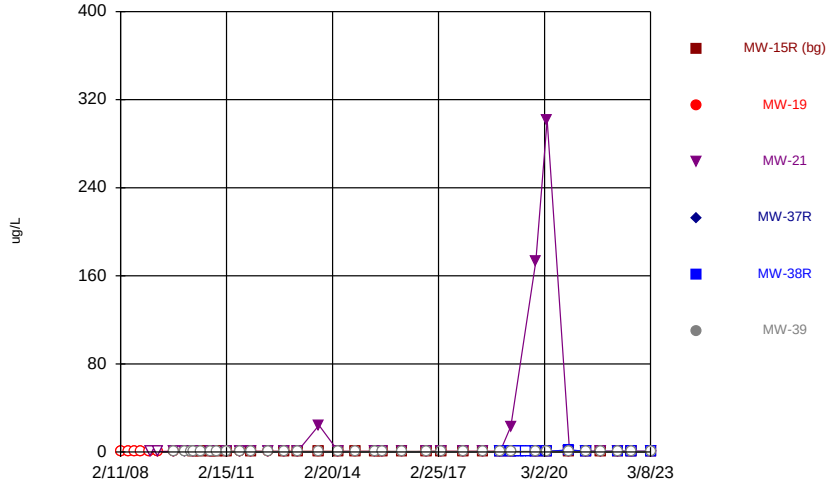
Time Series



Constituent: Tetrachloroethene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

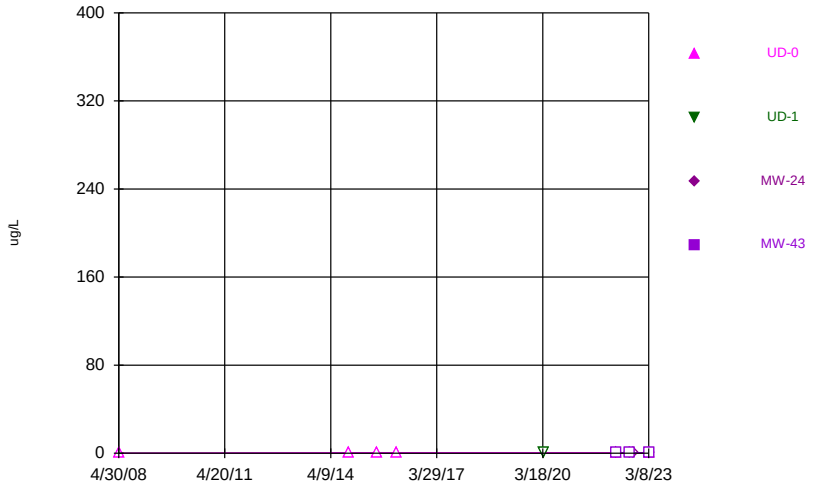
Time Series



Constituent: Toluene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

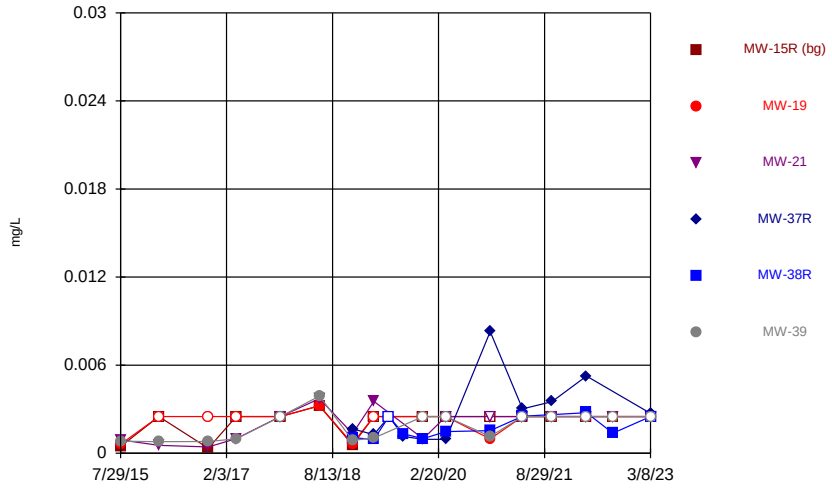
Time Series



Constituent: Toluene Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

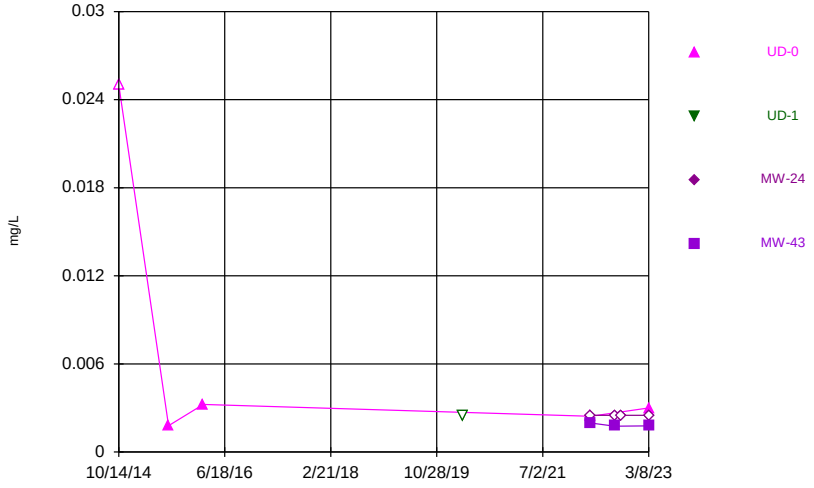
Time Series



Constituent: Vanadium Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

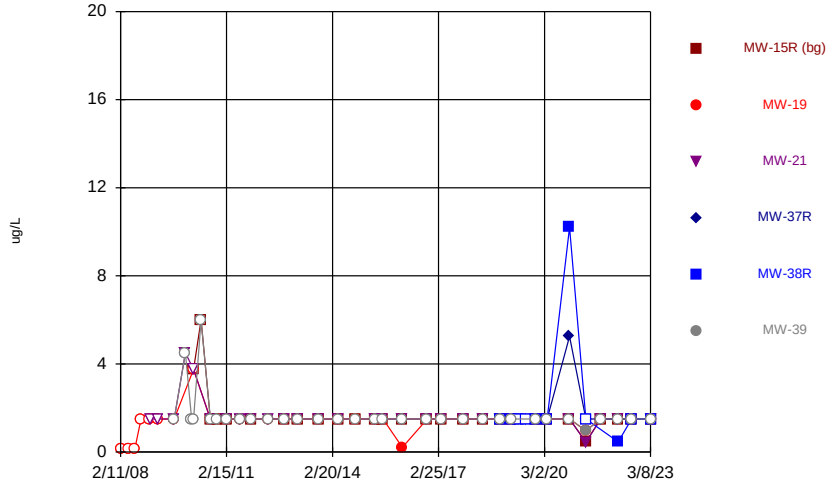
Time Series



Constituent: Vanadium Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

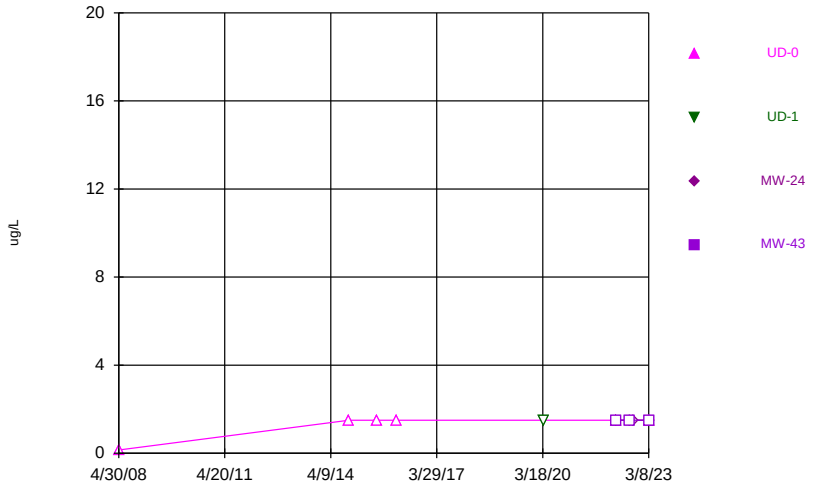
Time Series



Constituent: Xylenes, total Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

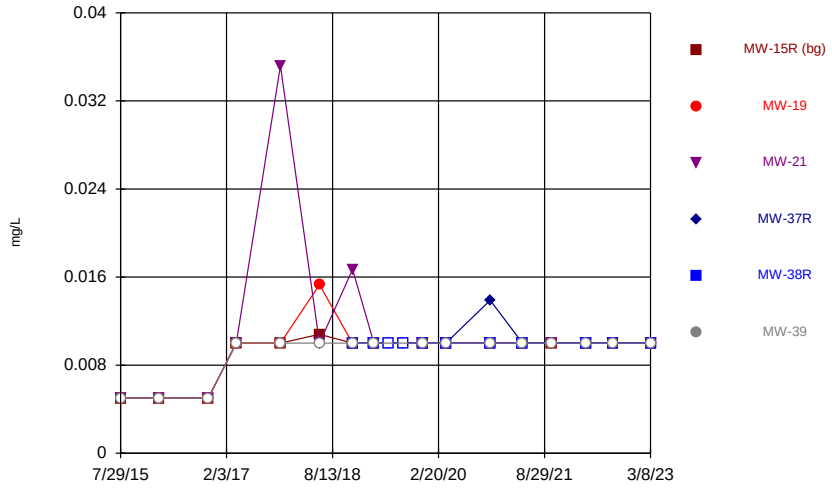
Time Series



Constituent: Xylenes, total Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

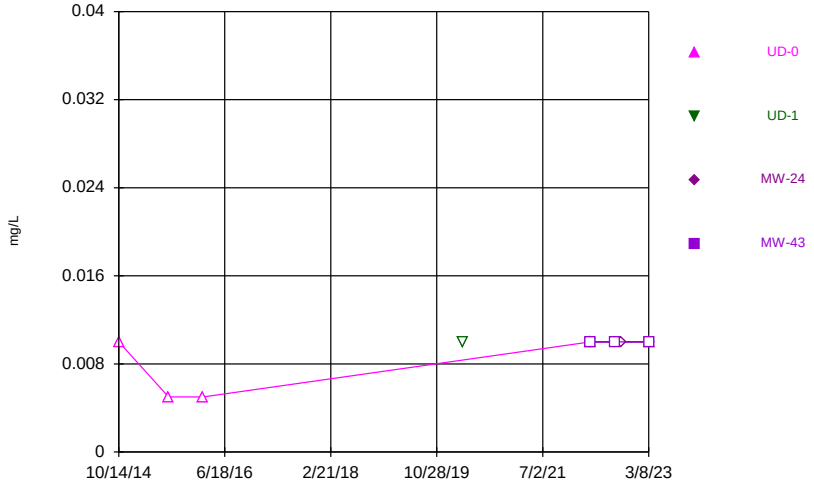
Time Series



Constituent: Zinc Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

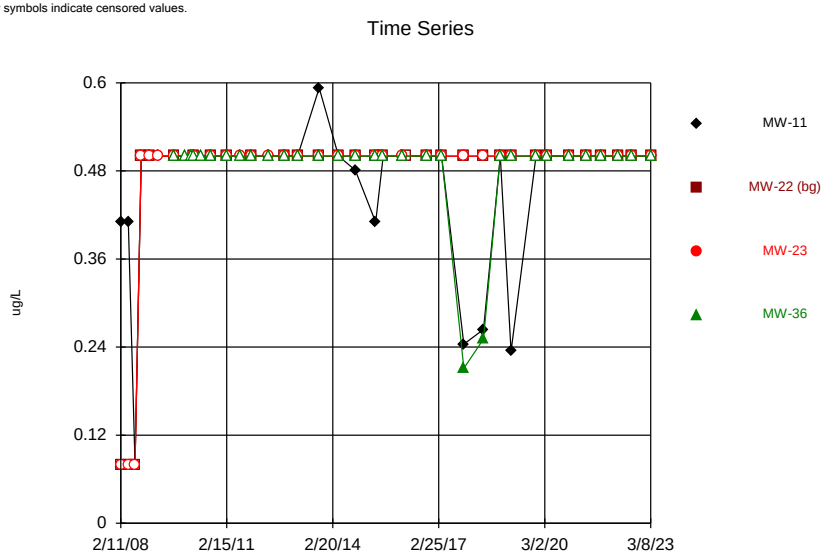
Time Series



Constituent: Zinc Analysis Run 5/11/2023 11:49 PM View: 2023SSN - Time Series WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

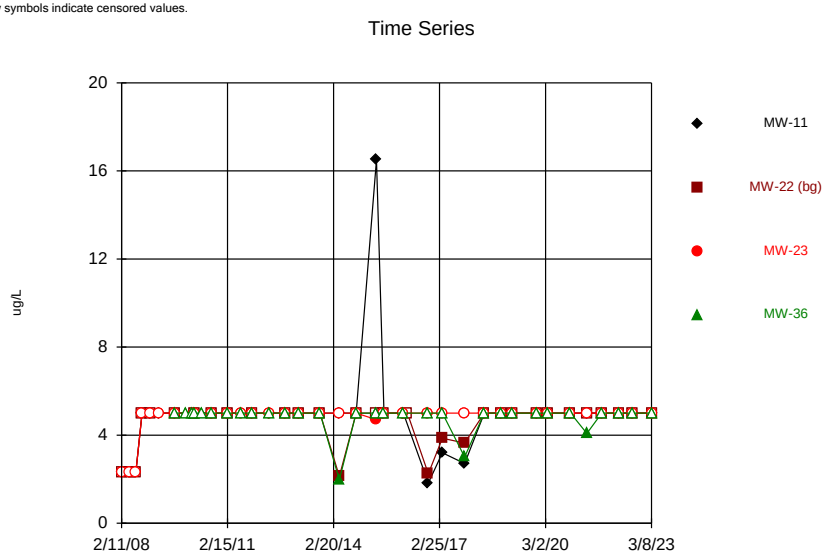
Time Series Plots –
Dakota Sandstone

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



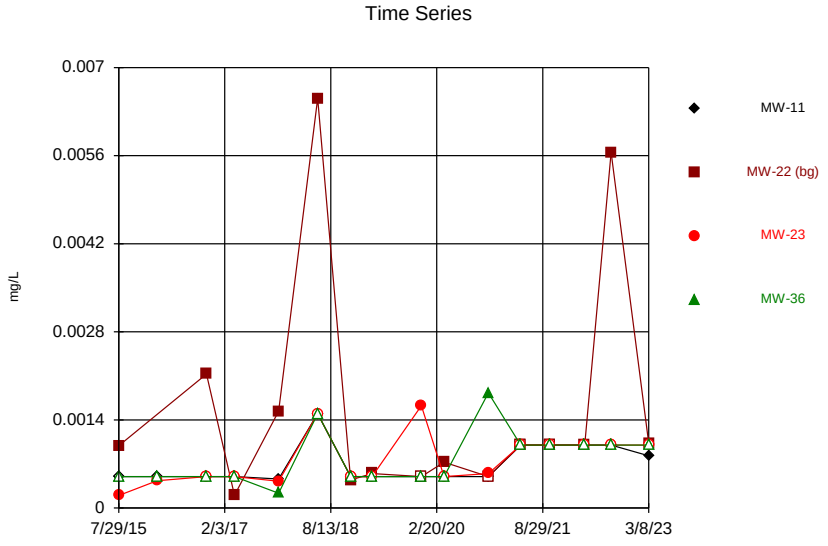
Constituent: 1,4-Dichlorobenzene Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



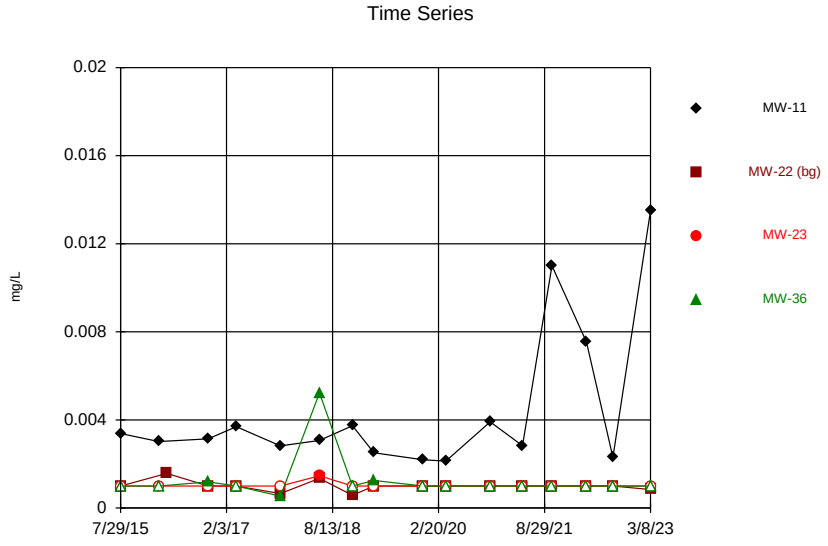
Constituent: Acetone Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Antimony Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

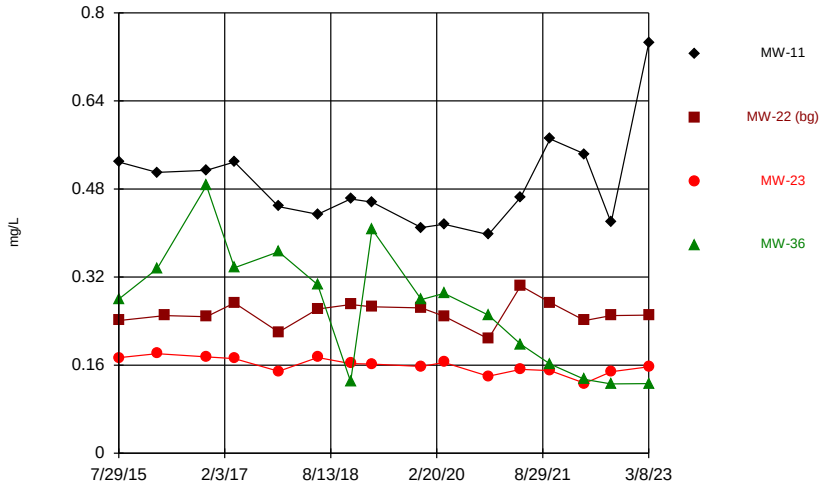
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Arsenic Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

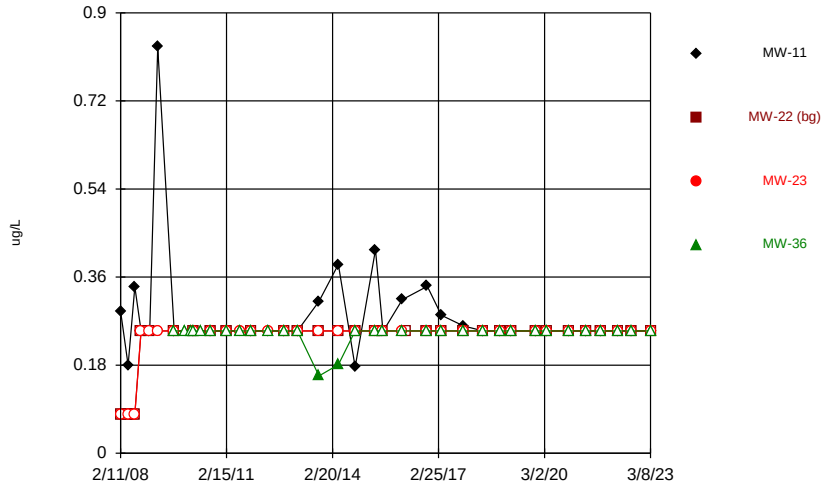
Time Series



Constituent: Barium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

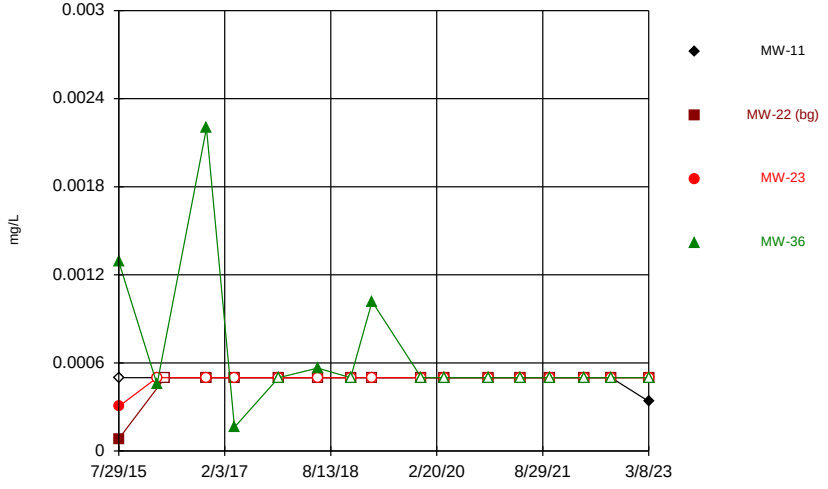
Time Series



Constituent: Benzene Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

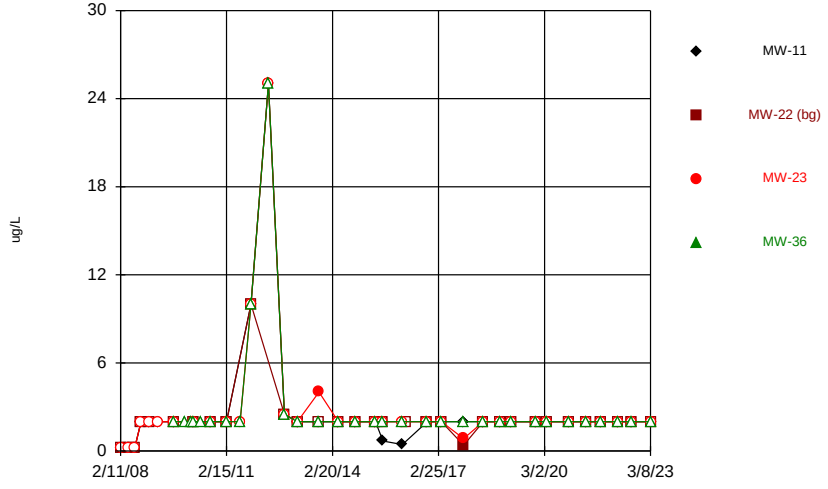
Time Series



Constituent: Beryllium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

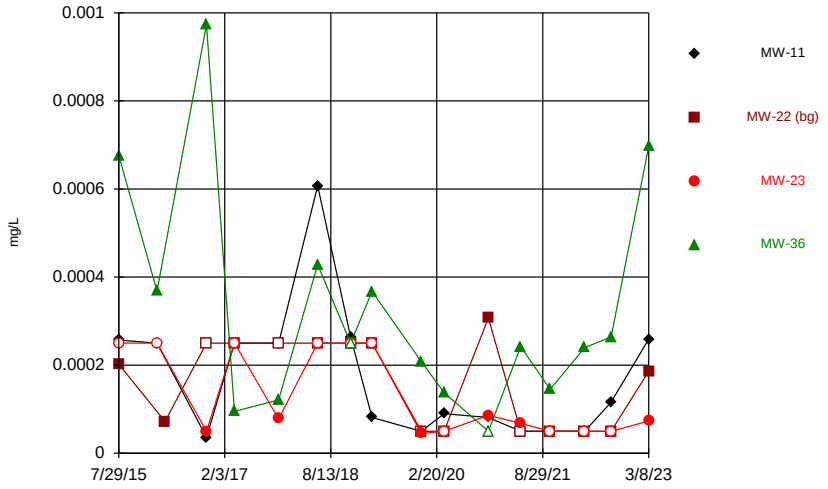
Time Series



Constituent: Bromomethane Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

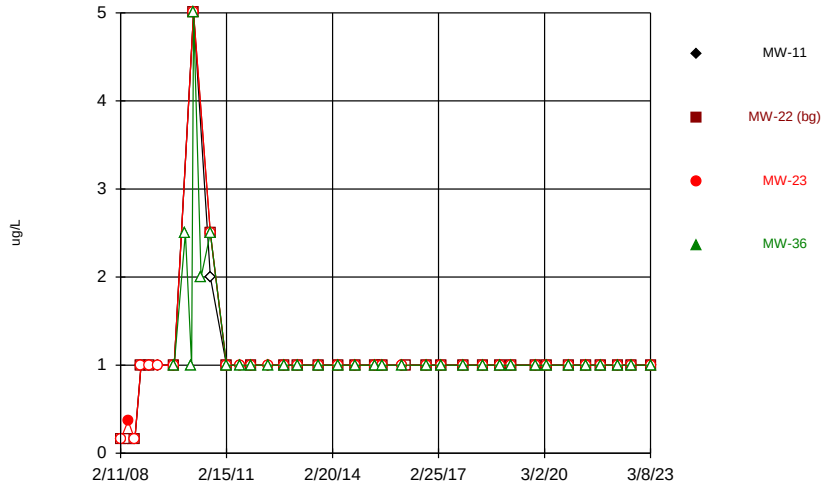
Time Series



Constituent: Cadmium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

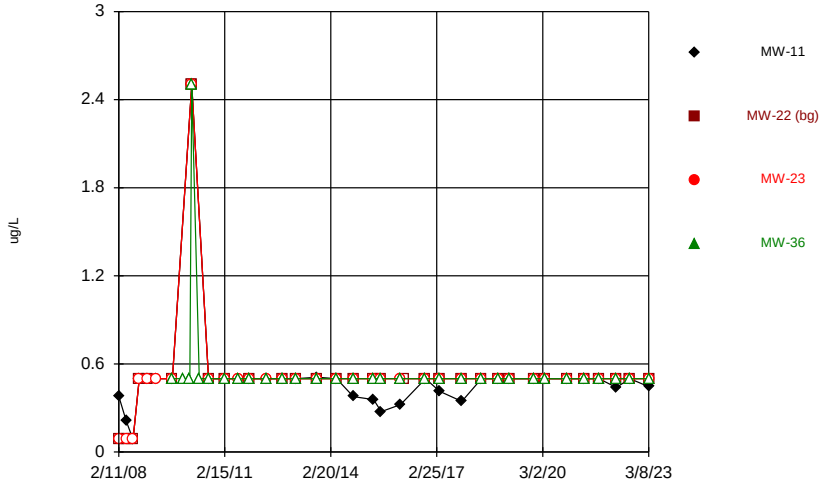
Time Series



Constituent: Carbon Tetrachloride Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

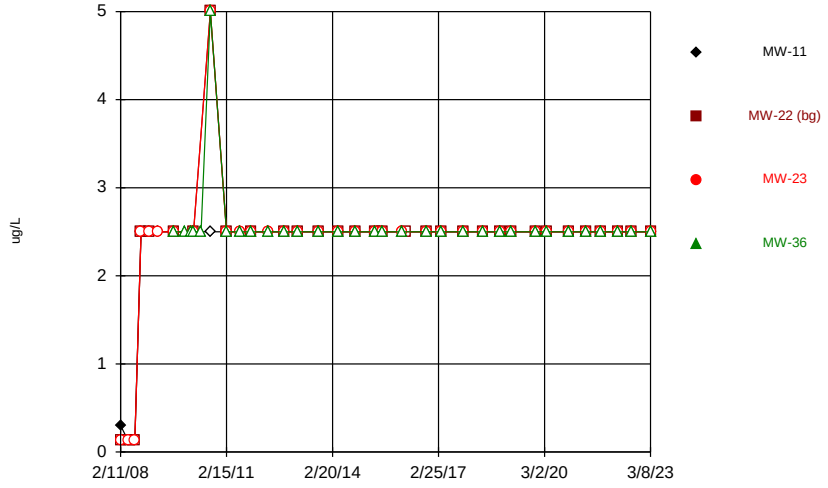
Time Series



Constituent: Chlorobenzene Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

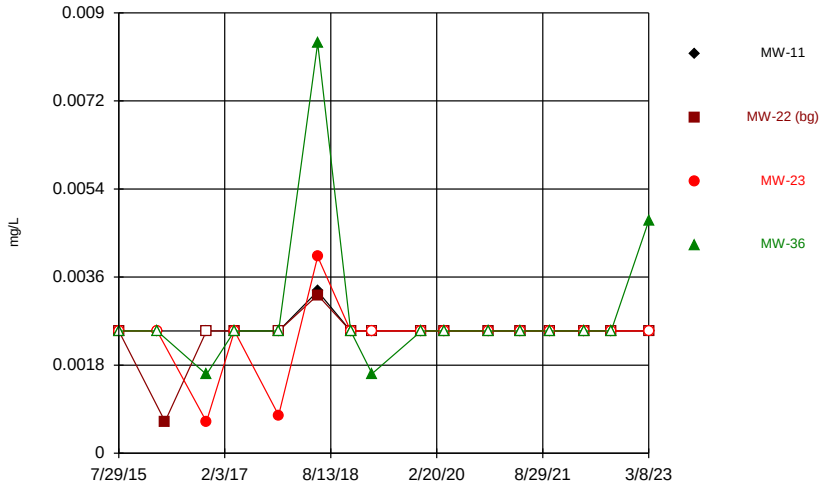
Time Series



Constituent: Chlorodibromomethane Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

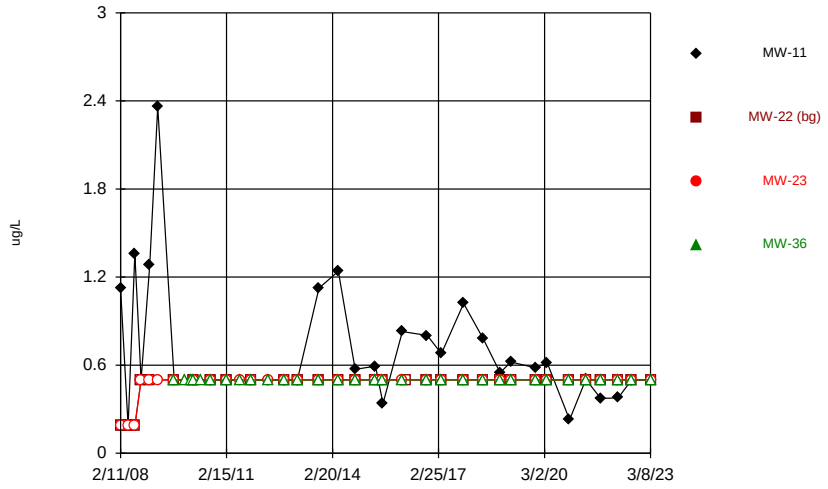
Time Series



Constituent: Chromium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

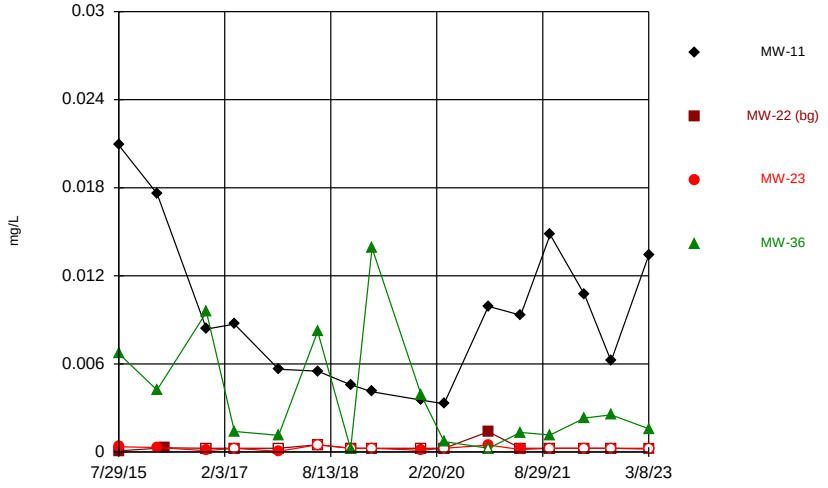
Time Series



Constituent: cis-1,2-Dichloroethene Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

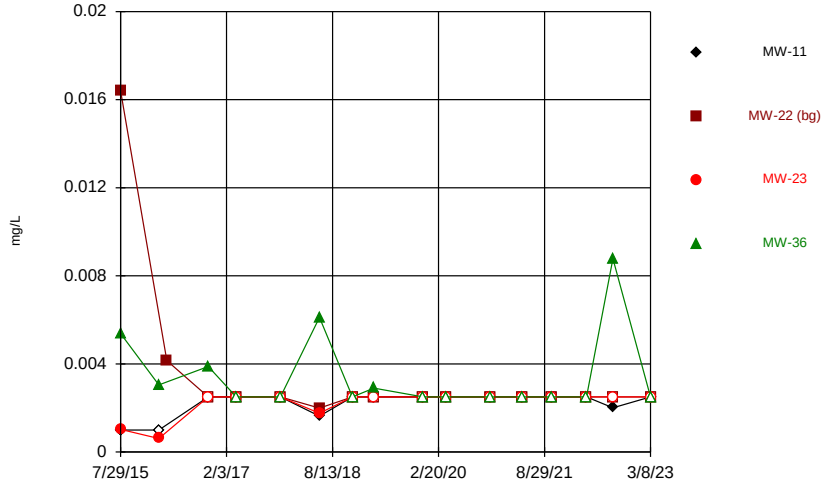
Time Series



Constituent: Cobalt Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

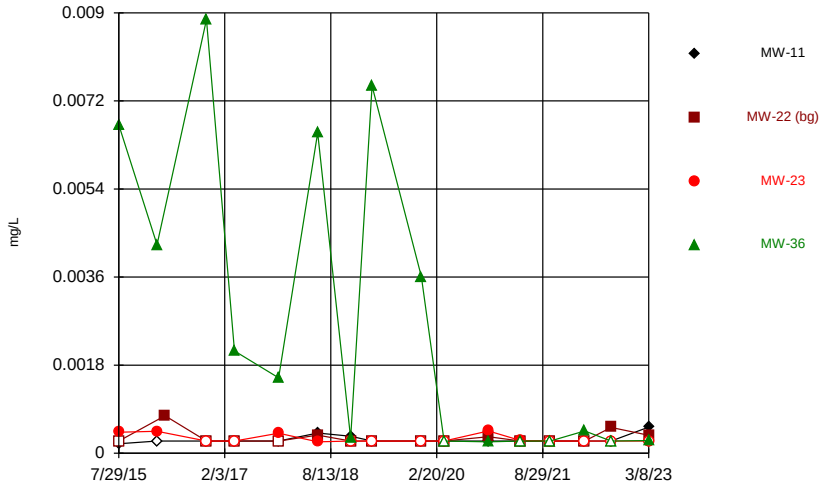
Time Series



Constituent: Copper Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

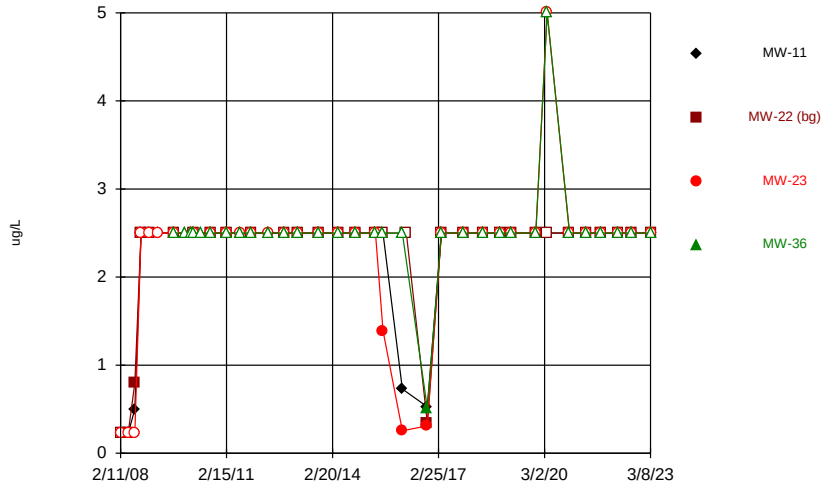
Time Series



Constituent: Lead Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

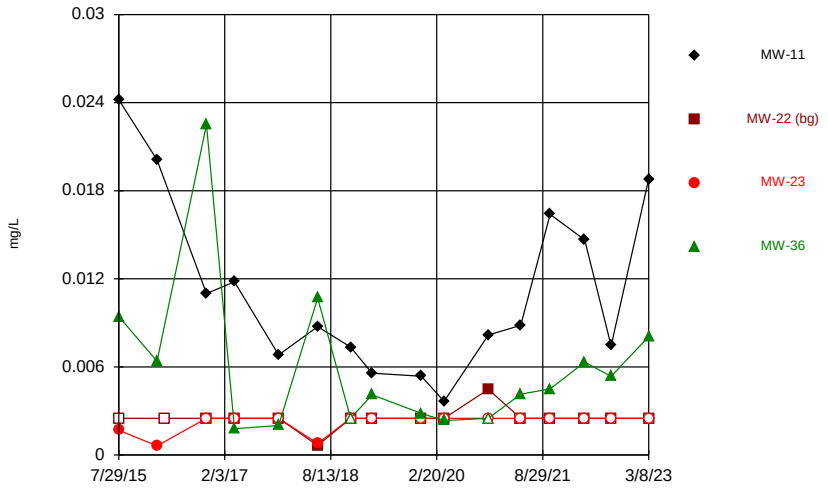
Time Series



Constituent: Methylene Chloride Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

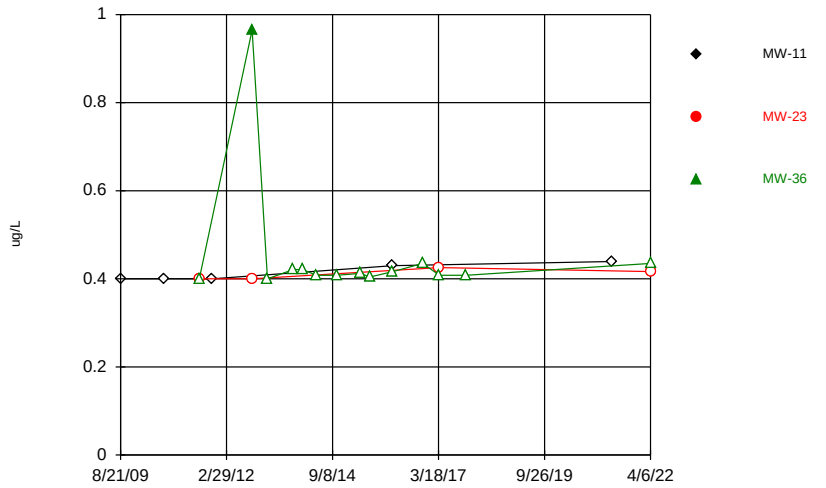
Time Series



Constituent: Nickel Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

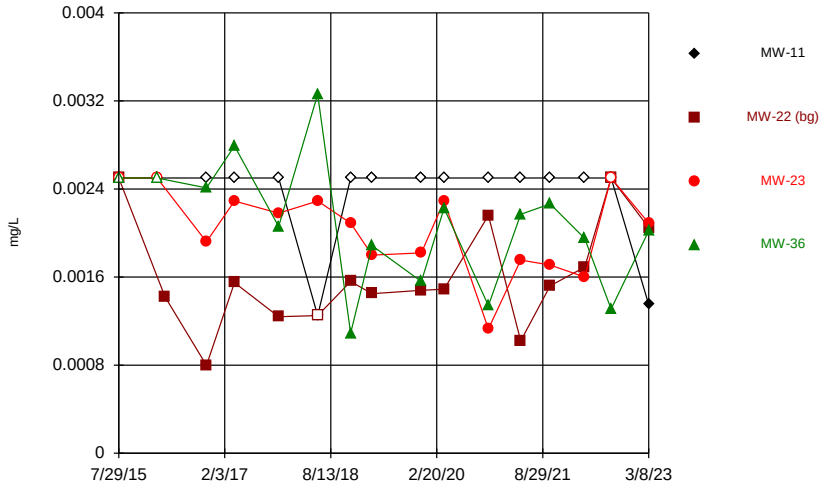
Time Series



Constituent: PCB-1260 Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

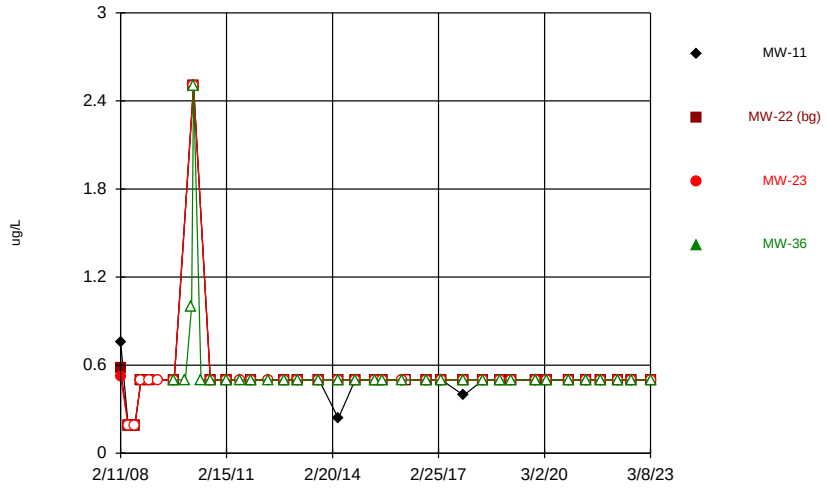
Time Series



Constituent: Selenium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

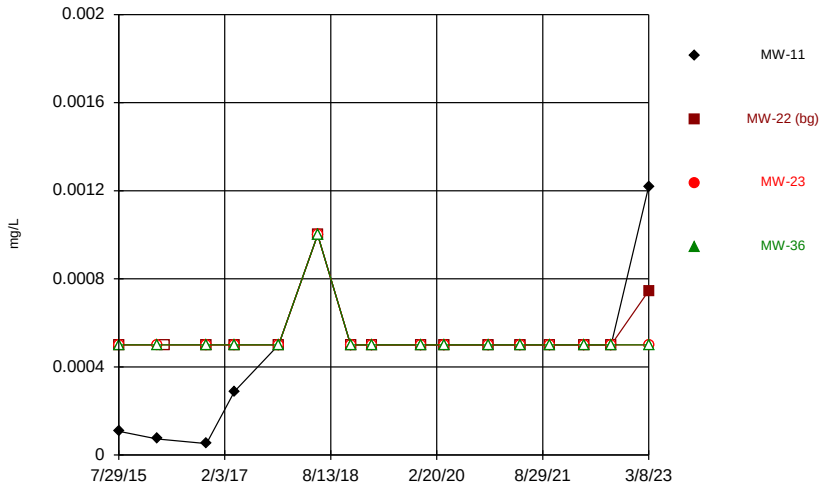
Time Series



Constituent: Tetrachloroethene Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

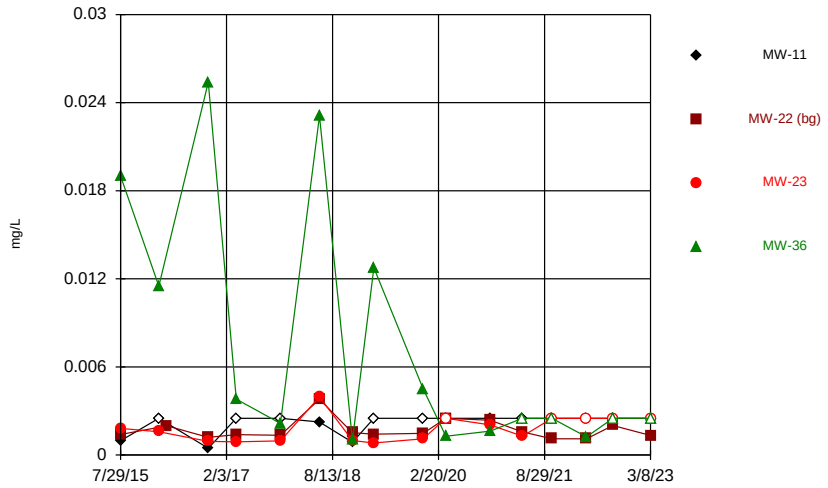
Time Series



Constituent: Thallium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

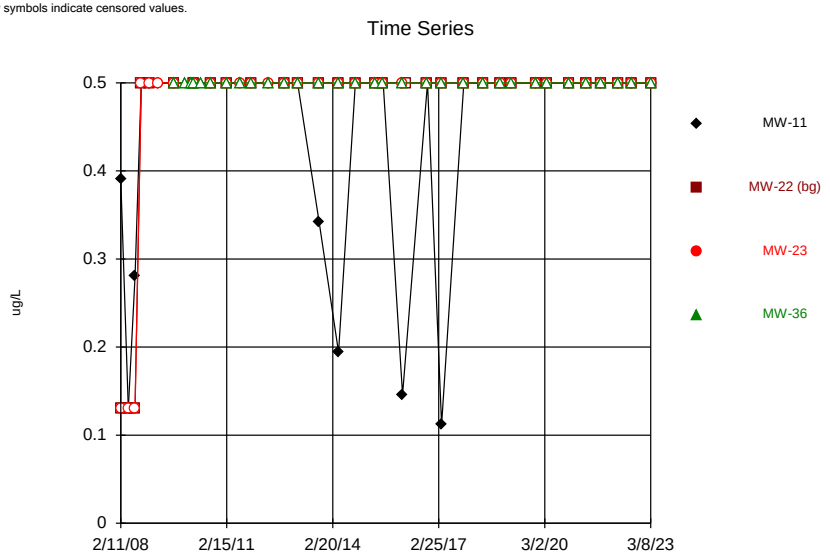
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



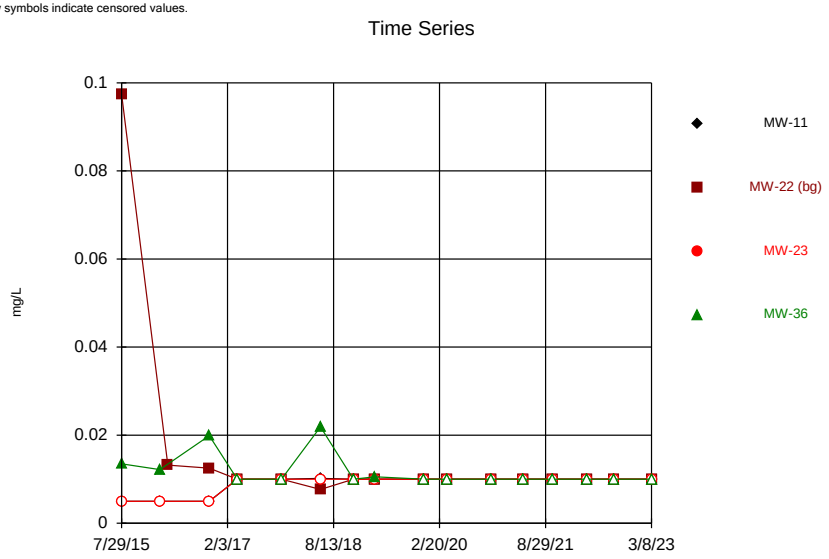
Constituent: Vanadium Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Vinyl Chloride Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Zinc Analysis Run 5/3/2023 10:42 AM View: 2023 SSN Timeseries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Outlier Test Summary Table and Graphs – Water Table

Outlier Analysis

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 5/12/2023, 10:53 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Normality Test
Antimony (mg/L)	**MW-15R (bg)**	**Yes**	**0.0015**	**6/6/2018**	**OH**	**NaN**	**16**	**0.0007034**	**0.0003314**	**n/a**
Arsenic (mg/L)	**MW-15R (bg)**	**Yes**	**0.00284**	**10/7/2021**	**Dixon/OH**	**0.01**	**16**	**0.001112**	**0.0005276**	**ShapiroWilk**
Barium (mg/L)	MW-15R (bg)	No	n/a	n/a	EPA/OH	0.05	16	0.2127	0.03187	ShapiroWilk
Cadmium (mg/L)	**MW-15R (bg)**	**Yes**	**0.00025,0.00025,0.00025,0.00025**	**2/15/2016,6/6/2018,11/27/2018,3/18/2019**	**OH**	**NaN**	**16**	**0.0001087**	**0.00008909**	**n/a**
Chromium (mg/L)	MW-15R (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	16	0.002104	0.0009699	ShapiroWilk
Cobalt (mg/L)	**MW-15R (bg)**	**Yes**	**0.00007,0.000152,0.0005,0.00102,0.000464**	**7/29/2015,2/15/2016,6/6/2018,11/27/20...**	**NP (nrm)/OH**	**NaN**	**16**	**0.0003111**	**0.0002142**	**ShapiroWilk**
Copper (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	16	0.002215	0.0006128	n/a
Lead (mg/L)	**MW-15R (bg)**	**Yes**	**0.000518**	**11/13/2017**	**OH**	**NaN**	**16**	**0.0002668**	**0.000067**	**n/a**
Nickel (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	16	0.002284	0.0005632	n/a
Selenium (mg/L)	MW-15R (bg)	No	n/a	n/a	EPA/OH	0.05	16	0.001724	0.0005923	ShapiroWilk
Vanadium (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	16	0.002162	0.0008679	n/a
Zinc (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	16	0.009112	0.00205	n/a

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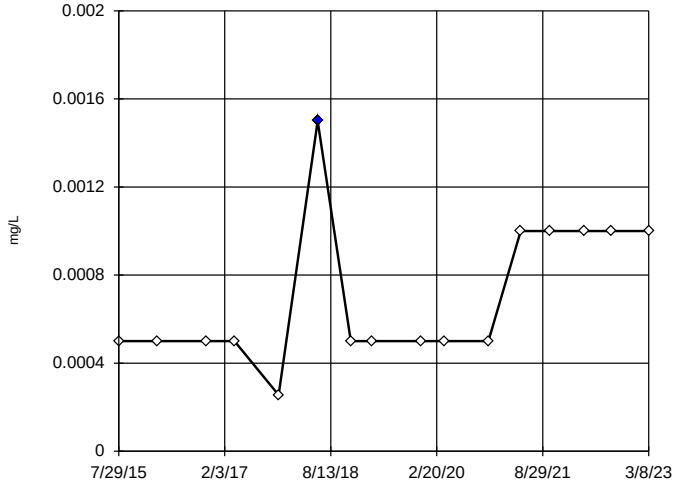
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Antimony Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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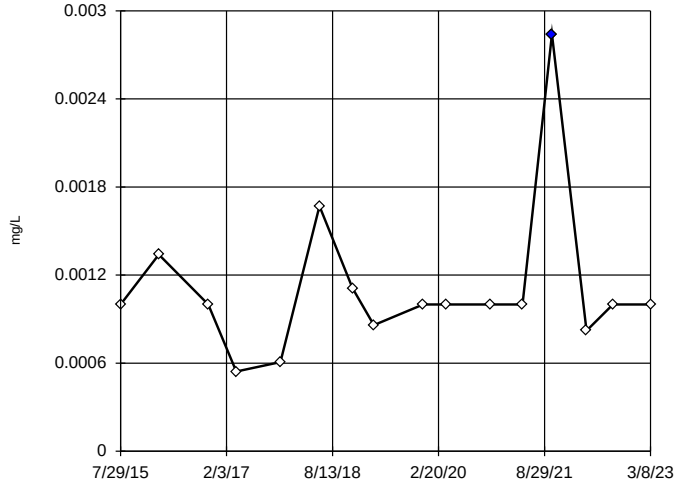
Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.001112.
Std. Dev. = 0.0005276.
0.00284: c = 0.7429
tabl = 0.595.
Alpha = 0.01.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.856
Critical = 0.835
The distribution, after removal of suspect value, was found to be normally distributed.

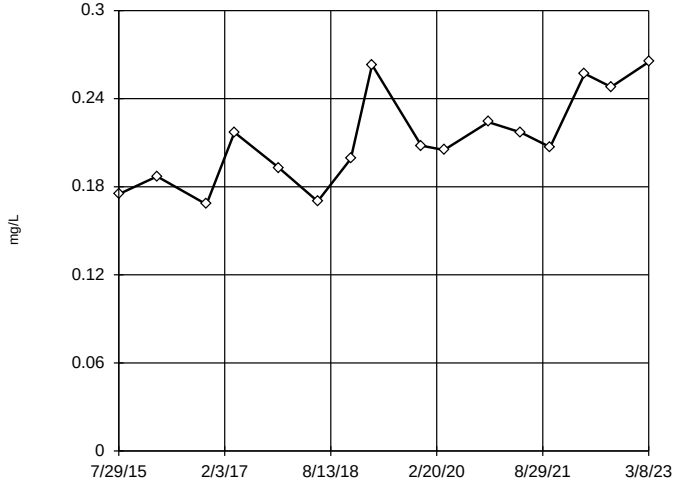
Constituent: Arsenic Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-15R (bg)



n = 16

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.2127, std. dev. 0.03187, critical Tn 2.443

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9323
Critical = 0.844
The distribution was found to be normally distributed.

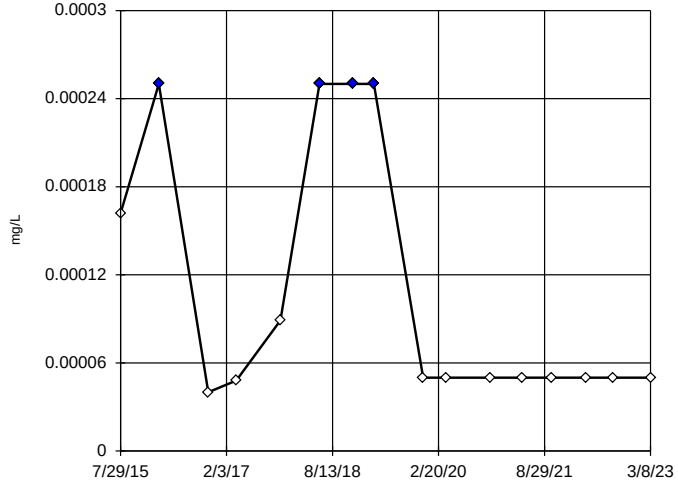
Constituent: Barium Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

Statistical outliers are drawn as solid.
Outliers per Ohio method.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9323
Critical = 0.844
The distribution, after removal of suspect values, was found to be normally distributed.

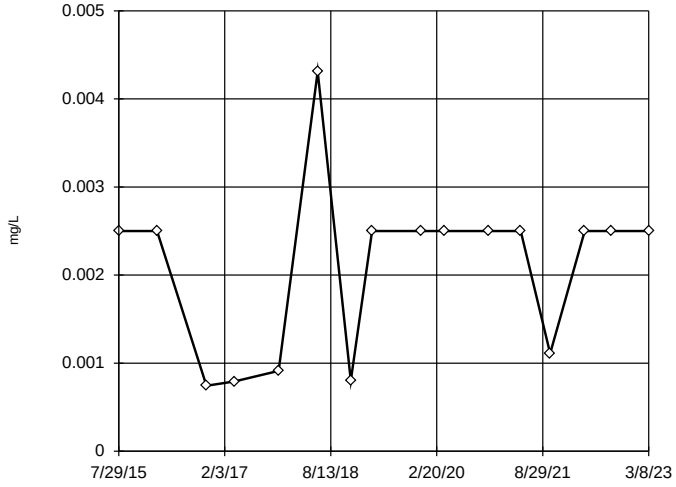
Constituent: Cadmium Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

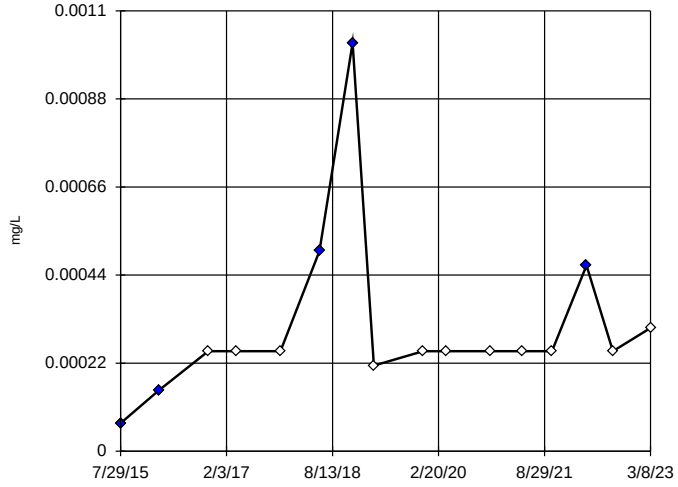
High cutoff = 0.006967, low cutoff = -0.003456, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.000366, low cutoff = 0.000163, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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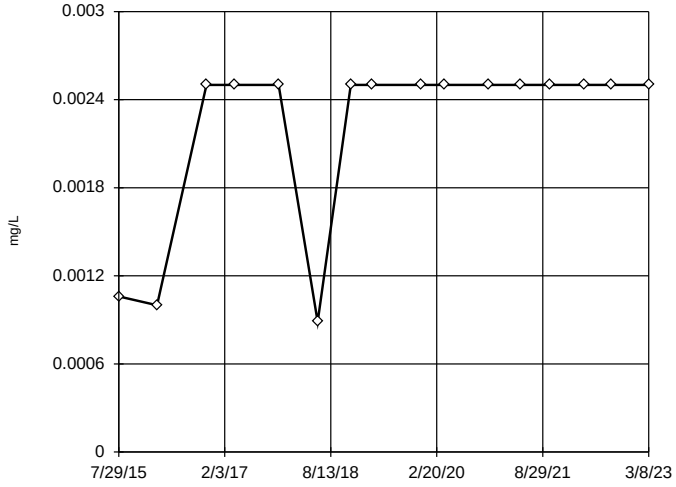
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

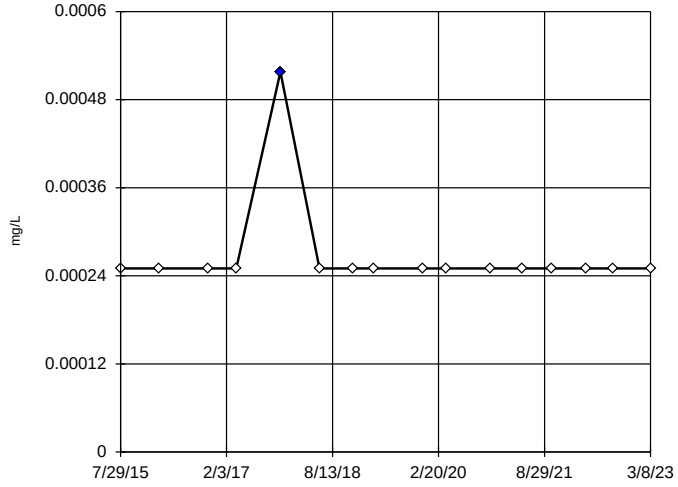
No statistical outliers.

Constituent: Copper Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Lead Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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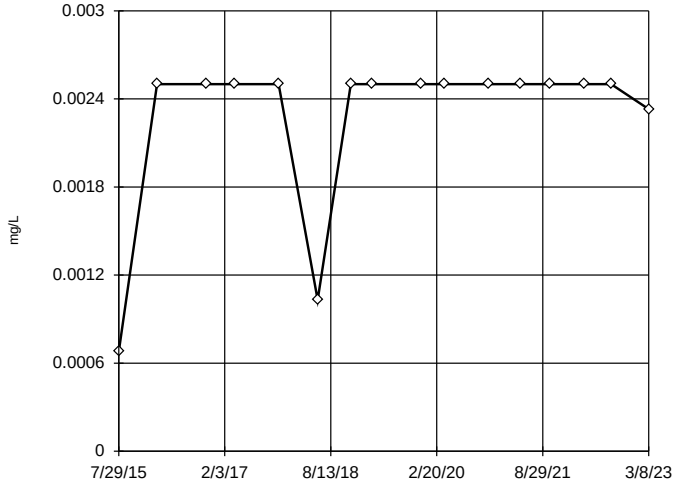
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

No statistical outliers.

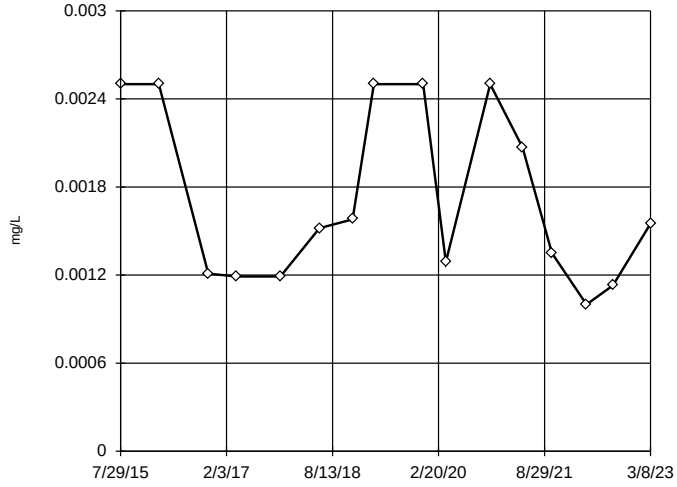
Constituent: Nickel Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-15R (bg)



n = 16

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.001724, std. dev. 0.0005923, critical Tn 2.443

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8573
Critical = 0.844 (after natural log transformation)
The distribution was found to be log-normal.

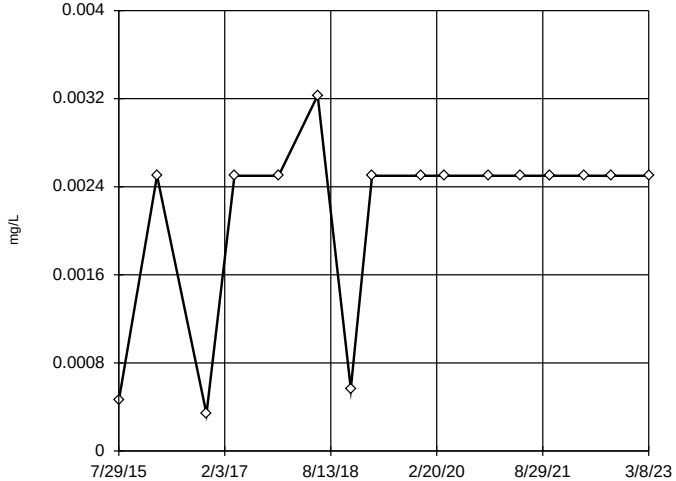
Constituent: Selenium Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

No statistical outliers.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8573
Critical = 0.844 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Vanadium Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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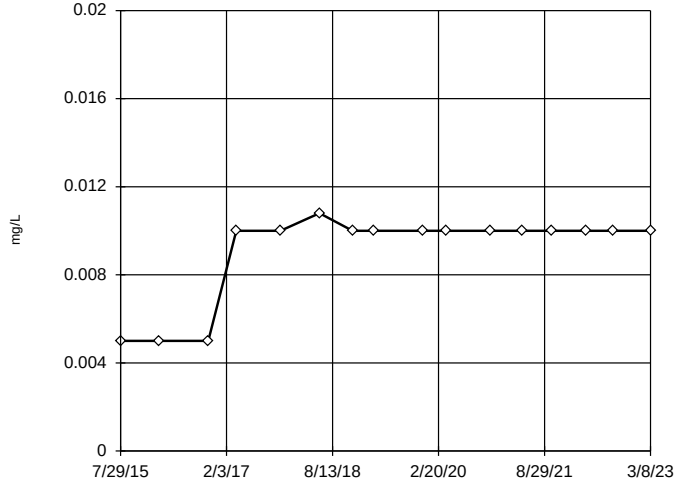
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 16

No statistical outliers.

Constituent: Zinc Analysis Run 5/12/2023 10:52 AM View: 2023SSN - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Outlier Test Summary Table and Graphs – Dakota Sandstone

Outlier Analysis

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS Printed 5/3/2023, 12:27 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	MW-22 (bg)	No	n/a	n/a	EPA/OH	0.05	15	0.001585	0.001892	ln(x)	ShapiroWilk
Arsenic (mg/L)	MW-22 (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	16	0.0009998	0.0002263	unknown	ShapiroWilk
Barium (mg/L)	MW-22 (bg)	No	n/a	n/a	EPA/OH	0.05	16	0.2544	0.02241	normal	ShapiroWilk
Beryllium (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	16	0.0004739	0.0001043	n/a	n/a
Cadmium (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	16	0.0001604	0.000101	n/a	n/a
Chromium (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	16	0.00243	0.0005084	n/a	n/a
Cobalt (mg/L)	**MW-22 (bg)**	**Yes**	**0.00138**	**11/17/2020**	**OH**	**NaN**	**16**	**0.000325**	**0.0002925**	**n/a**	**n/a**
Copper (mg/L)	**MW-22 (bg)**	**Yes**	**0.0164**	**7/29/2015**	**OH**	**NaN**	**16**	**0.00344**	**0.003484**	**n/a**	**n/a**
Lead (mg/L)	**MW-22 (bg)**	**Yes**	**0.000765**	**3/28/2016**	**NP (nrm)/OH**	**NaN**	**16**	**0.0003201**	**0.0001415**	**unknown**	**ShapiroWilk**
Nickel (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	16	0.002507	0.0006977	n/a	n/a
Selenium (mg/L)	MW-22 (bg)	No	n/a	n/a	EPA/OH	0.05	16	0.001605	0.0004808	normal	ShapiroWilk
Silver (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	16	0.0004723	0.000113	n/a	n/a
Thallium (mg/L)	**MW-22 (bg)**	**Yes**	**0.001**	**6/6/2018**	**OH**	**NaN**	**16**	**0.0005466**	**0.0001356**	**n/a**	**n/a**
Vanadium (mg/L)	MW-22 (bg)	No	n/a	n/a	Dixon/OH	0.01	16	0.001721	0.0006957	normal	ShapiroWilk
Zinc (mg/L)	**MW-22 (bg)**	**Yes**	**0.0974**	**7/29/2015**	**OH**	**NaN**	**16**	**0.01567**	**0.02183**	**n/a**	**n/a**

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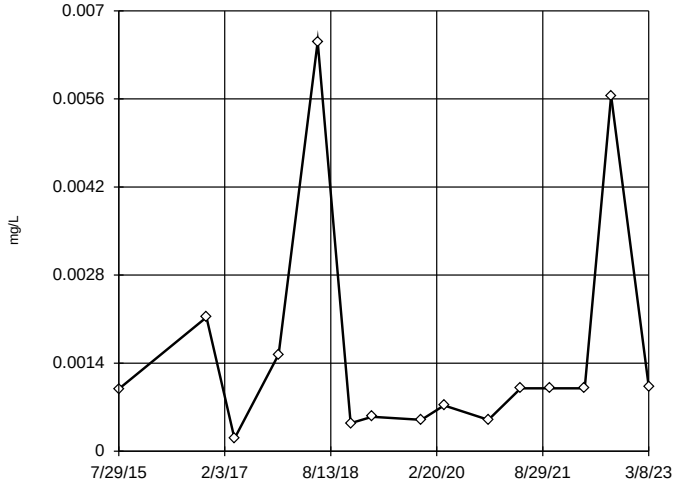
EPA Screening (suspected outliers for Dixon's Test)

MW-22 (bg)



n = 15

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.001585, std. dev. 0.001892, critical Tn 2.409

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9232
Critical = 0.835 (after natural log transformation)
The distribution was found to be log-normal.

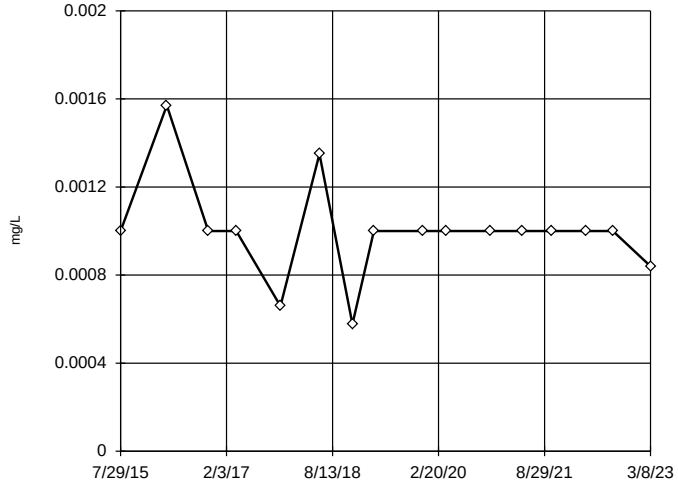
Constituent: Antimony Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

The results were invalidated, because the lower and upper quartiles are equal.

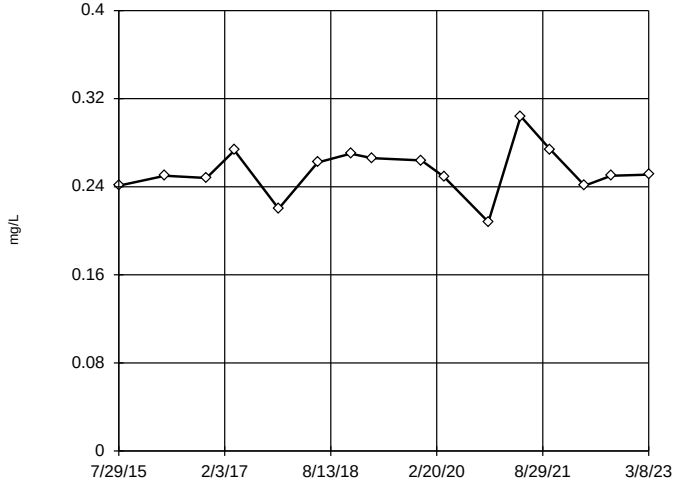
Constituent: Arsenic Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)

MW-22 (bg)



n = 16

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.2544, std. dev. 0.02241, critical Tn 2.443

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9553
Critical = 0.844
The distribution was found to be normally distributed.

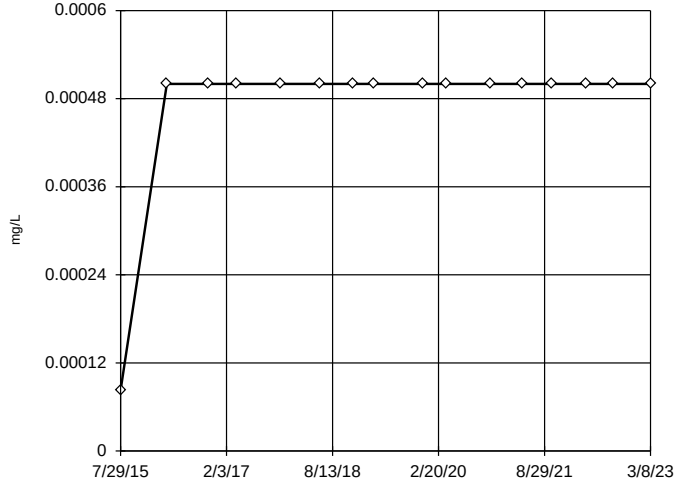
Constituent: Barium Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No statistical outliers.

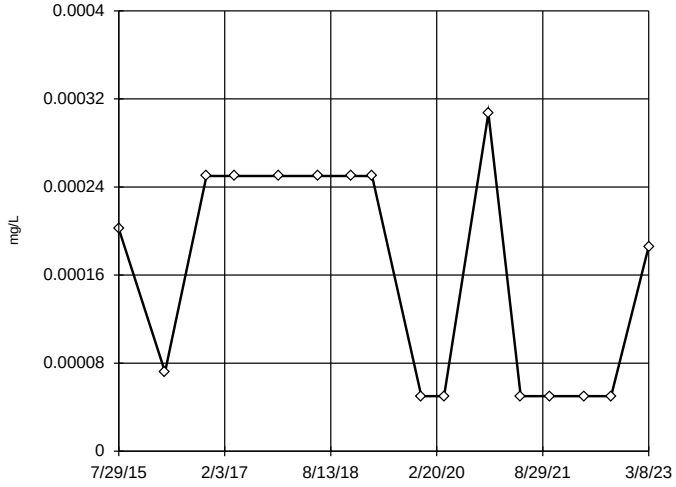
Constituent: Beryllium Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No statistical outliers.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9553
Critical = 0.844
The distribution was found to be normally distrib-uted.

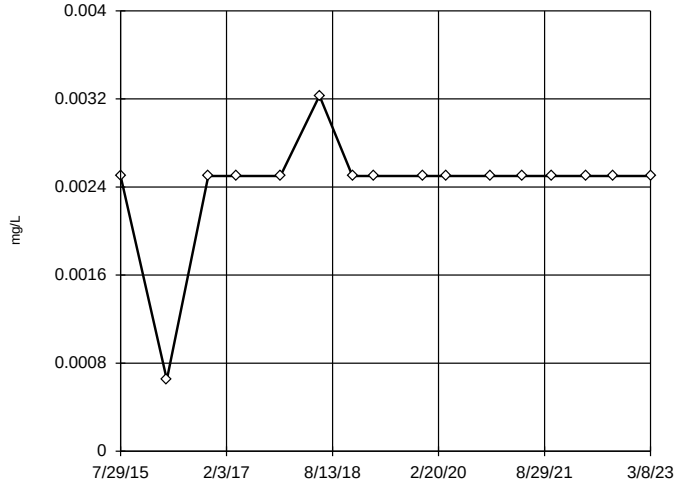
Constituent: Cadmium Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No statistical outliers.

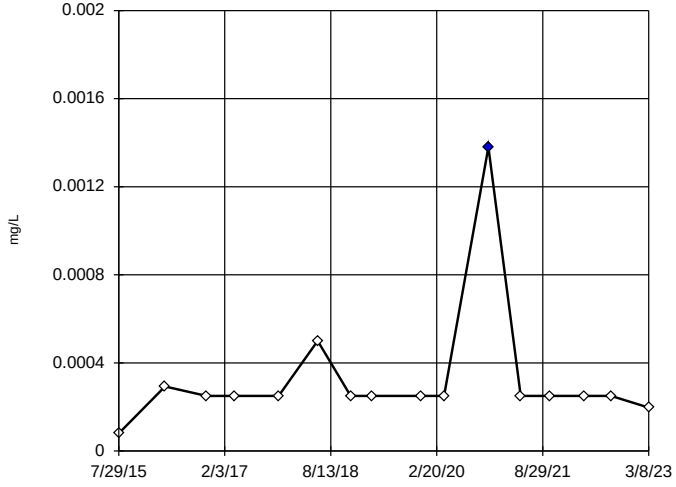
Constituent: Chromium Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9553
Critical = 0.844
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

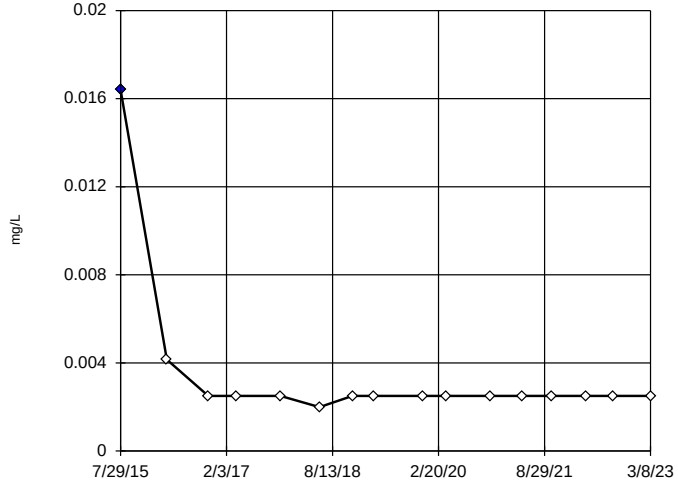
Constituent: Cobalt Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Copper Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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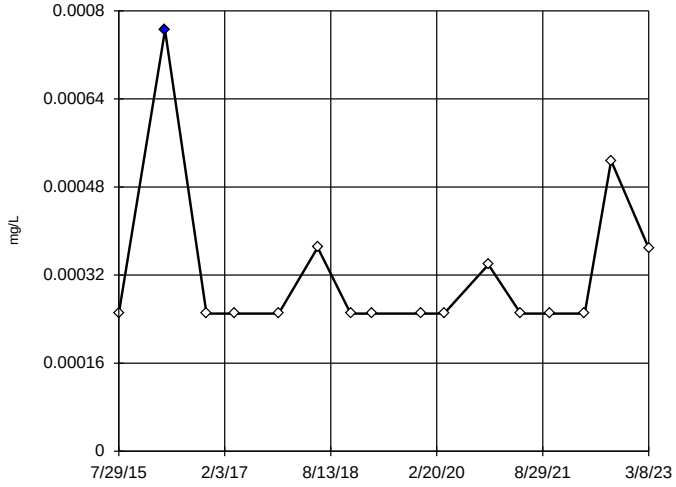
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.000666, low cutoff = -0.000062, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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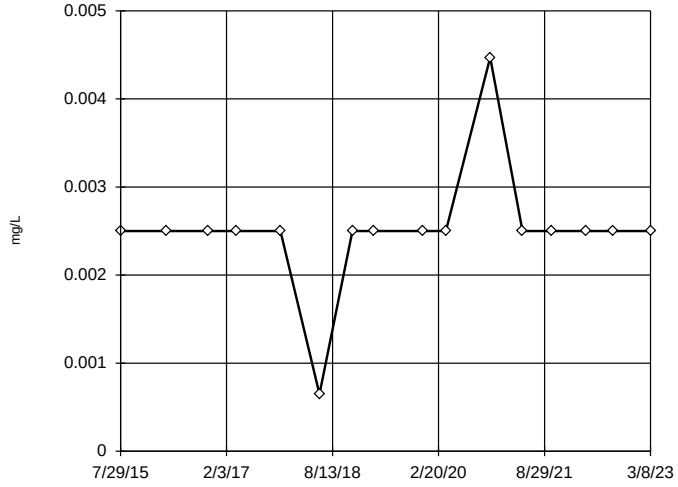
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No statistical outliers.

Constituent: Nickel Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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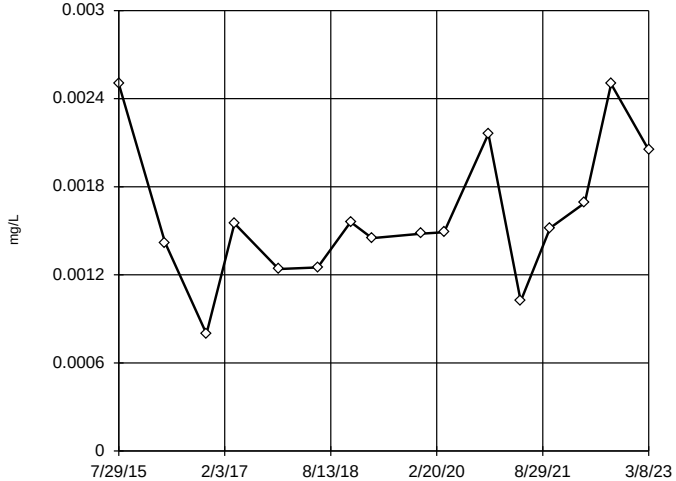
EPA Screening (suspected outliers for Dixon's Test)

MW-22 (bg)



n = 16

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Ohio method in use. Mean 0.001605, std. dev. 0.0004808, critical Tn 2.443

Normality test used: Shapiro Wilk@alpha = 0.01 Calculated = 0.9234 Critical = 0.844 The distribution was found to be normally distributed.

Constituent: Selenium Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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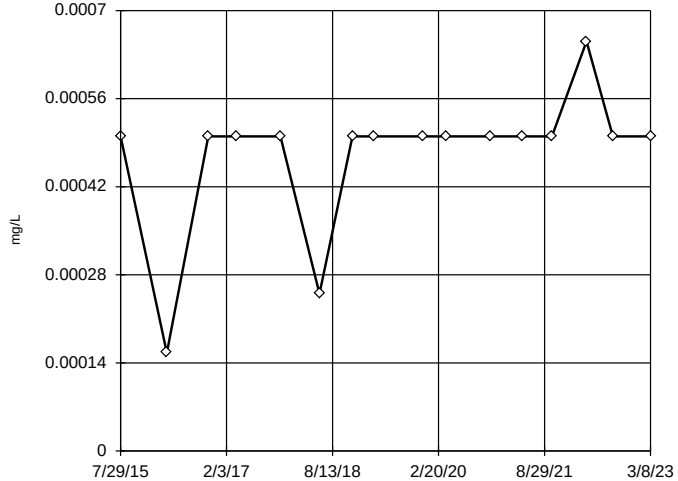
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No statistical outliers.

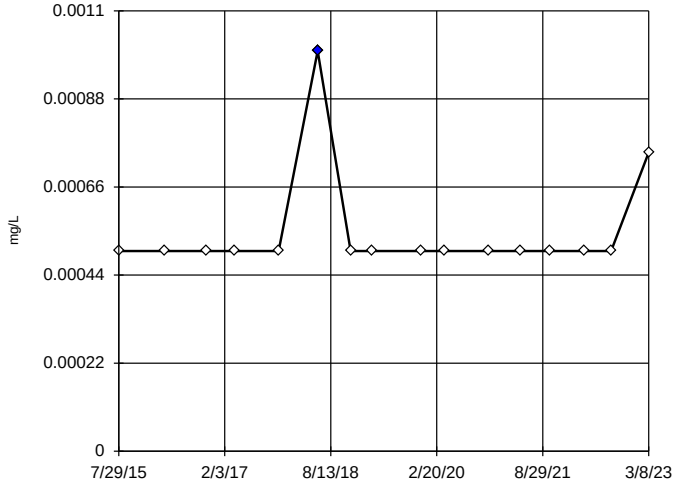
Constituent: Silver Analysis Run 5/3/2023 12:24 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Thallium Analysis Run 5/3/2023 12:25 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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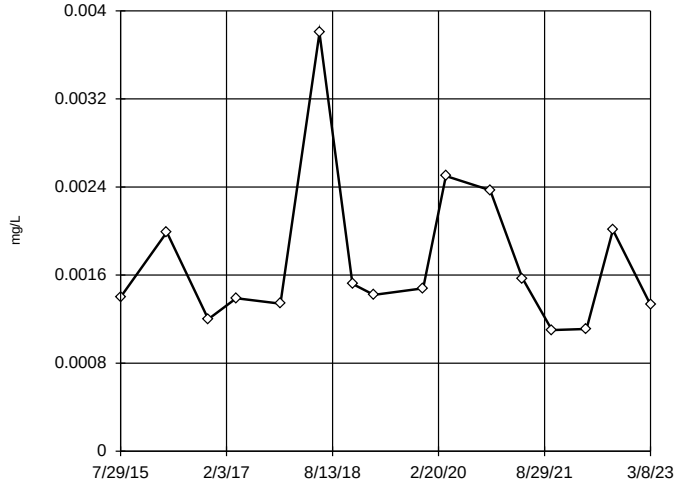
Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

No statistical outliers.
Testing for 1 high outlier.
Mean = 0.001721.
Std. Dev. = 0.0006957.
0.0038 (J): c = 0.55
tabl = 0.595.
Alpha = 0.01.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8609
Critical = 0.835
The distribution was found to be normally distrib-uted.

Constituent: Vanadium Analysis Run 5/3/2023 12:25 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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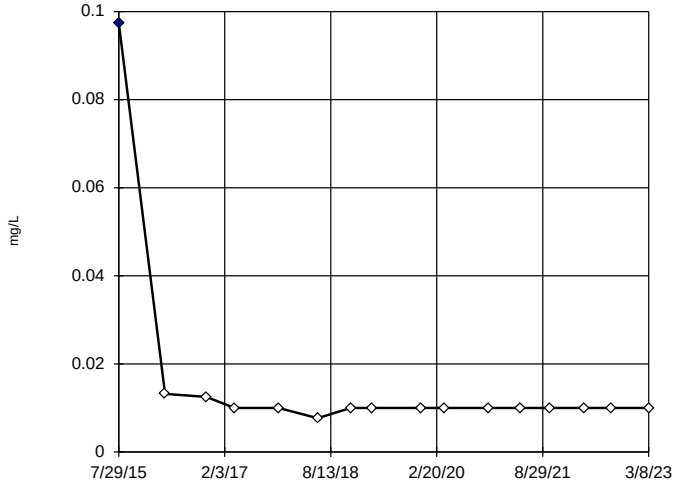
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 16

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8609
Critical = 0.835
The distribution, after removal of suspect val-ue, was found to be nor-mally distributed.

Constituent: Zinc Analysis Run 5/3/2023 12:25 PM View: 2023 SSN Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Interwell Prediction Limits Summary Table and Graphs – Water Table

Prediction Limit

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 5/12/2023, 11:56 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Trans...	Alpha	Method
Barium (mg/L)	**MW-19**	**0.2931**	**n/a**	**3/8/2023**	**1.27**	**Yes**	**16**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	**MW-21**	**0.2931**	**n/a**	**3/8/2023**	**1.21**	**Yes**	**16**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	**MW-37R**	**0.2931**	**n/a**	**3/8/2023**	**0.863**	**Yes**	**16**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	MW-38R	0.2931	n/a	3/8/2023	0.261	No	16	0	No	0.0004877	Param Inter 1 of 2
Barium (mg/L)	MW-39	0.2931	n/a	3/8/2023	0.0949	No	16	0	No	0.0004877	Param Inter 1 of 2
Barium (mg/L)	**MW-24**	**0.2931**	**n/a**	**3/8/2023**	**0.819**	**Yes**	**16**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	MW-43	0.2931	n/a	3/8/2023	0.202	No	16	0	No	0.0004877	Param Inter 1 of 2
Cadmium (mg/L)	MW-37R	0.00025	n/a	3/8/2023	0.000186	No	12	100	n/a	0.008444	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	MW-39	0.00025	n/a	3/8/2023	0.000129	No	12	100	n/a	0.008444	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	**MW-24**	**0.00025**	**n/a**	**3/8/2023**	**0.000692**	**Yes**	**12**	**100**	**n/a**	**0.008444**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-19**	**0.00102**	**n/a**	**3/8/2023**	**0.02355**	**Yes**	**11**	**90.91**	**n/a**	**0.009674**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-21**	**0.00102**	**n/a**	**3/8/2023**	**0.00573**	**Yes**	**11**	**90.91**	**n/a**	**0.009674**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	MW-37R	0.00102	n/a	3/8/2023	0.00069	No	11	90.91	n/a	0.009674	NP Inter (NDs) 1 of 2
Cobalt (mg/L)	**MW-24**	**0.00102**	**n/a**	**3/8/2023**	**0.00283**	**Yes**	**11**	**90.91**	**n/a**	**0.009674**	**NP Inter (NDs) 1 of 2**
Lead (mg/L)	**MW-37R**	**0.000518**	**n/a**	**3/8/2023**	**0.00159**	**Yes**	**16**	**93.75**	**n/a**	**0.005453**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-19**	**0.0025**	**n/a**	**3/8/2023**	**0.06165**	**Yes**	**13**	**100**	**n/a**	**0.007682**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-21**	**0.0025**	**n/a**	**3/8/2023**	**0.00853**	**Yes**	**13**	**100**	**n/a**	**0.007682**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-38R**	**0.0025**	**n/a**	**3/8/2023**	**0.00569**	**Yes**	**13**	**100**	**n/a**	**0.007682**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-24**	**0.0025**	**n/a**	**3/8/2023**	**0.0301**	**Yes**	**13**	**100**	**n/a**	**0.007682**	**NP Inter (NDs) 1 of 2**
Selenium (mg/L)	**MW-37R**	**0.0025**	**n/a**	**3/8/2023**	**0.0201**	**Yes**	**5**	**100**	**n/a**	**0.02583**	**NP Inter (NDs) 1 of 2**
Selenium (mg/L)	**MW-38R**	**0.0025**	**n/a**	**3/8/2023**	**0.0291**	**Yes**	**5**	**100**	**n/a**	**0.02583**	**NP Inter (NDs) 1 of 2**
Selenium (mg/L)	**MW-39**	**0.0025**	**n/a**	**3/8/2023**	**0.0794**	**Yes**	**5**	**100**	**n/a**	**0.02583**	**NP Inter (NDs) 1 of 2**
Selenium (mg/L)	**MW-43**	**0.0025**	**n/a**	**3/8/2023**	**0.0244**	**Yes**	**5**	**100**	**n/a**	**0.02583**	**NP Inter (NDs) 1 of 2**

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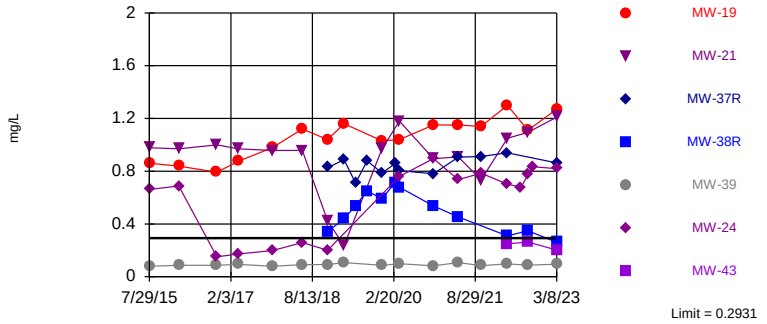
Exceeds Limit: MW-19, MW-21, MW-37R, MW-24

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2127, Std. Dev.=0.03187, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9323, critical = 0.844. Kappa = 2.523 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.00438. Individual comparison alpha = 0.0004877. Comparing 7 points to limit. Assumes 2 future values.

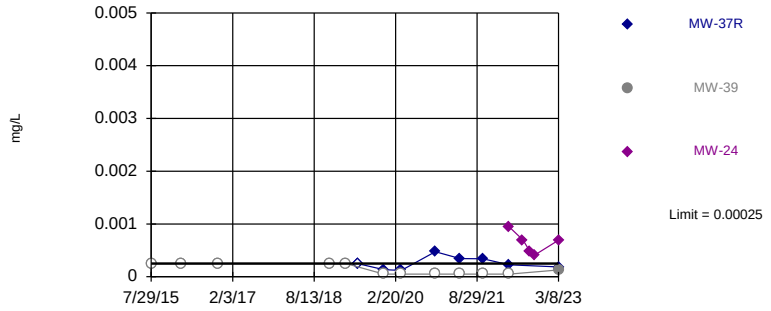
Constituent: Barium Analysis Run 5/12/2023 11:54 AM View: 2023SSN - Interwell PL - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-24

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 100% NDs. Annual per-constituent alpha = 0.1416. Individual comparison alpha = 0.008444 (1 of 2). Comparing 3 points to limit. Assumes 6 future values.

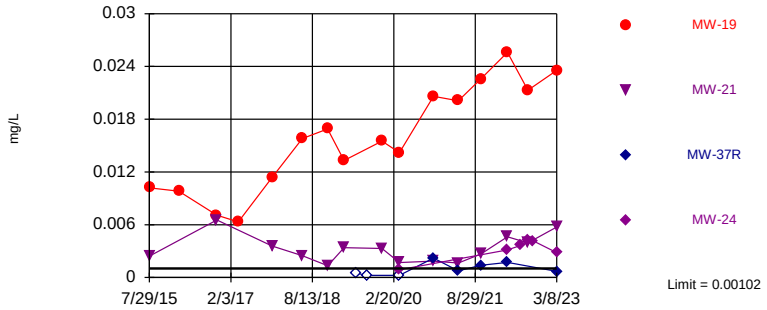
Constituent: Cadmium Analysis Run 5/12/2023 11:54 AM View: 2023SSN - Interwell PL - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-19, MW-21, MW-24

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 11 background values. 90.91% NDs. Annual per-constituent alpha = 0.1605. Individual comparison alpha = 0.009674 (1 of 2). Comparing 4 points to limit. Assumes 5 future values.

Constituent: Cobalt Analysis Run 5/12/2023 11:54 AM View: 2023SSN - Interwell PL - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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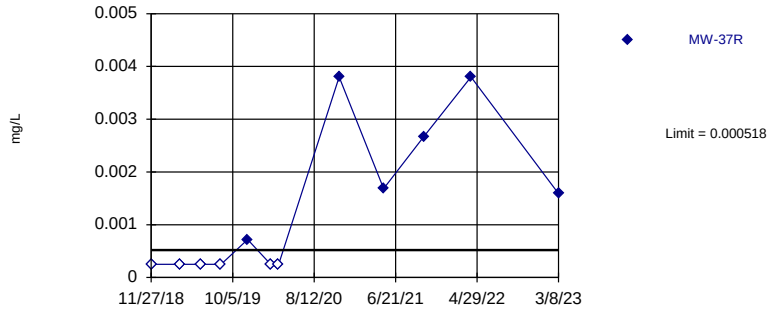
Hollow symbols indicate censored values.

Exceeds Limit: MW-37R

Prediction Limit

Interwell Non-parametric

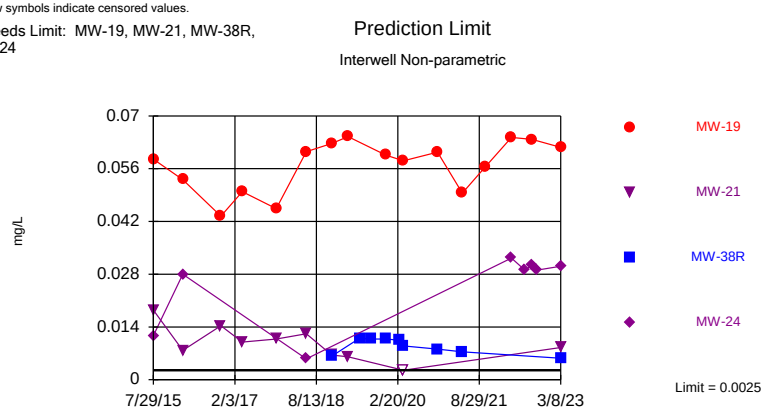


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 93.75% NDs. Annual per-constituent alpha = 0.09374. Individual comparison alpha = 0.005453 (1 of 2). Assumes 8 future values.

Constituent: Lead Analysis Run 5/12/2023 11:54 AM View: 2023SSN - Interwell PL - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-19, MW-21, MW-38R, MW-24



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 100% NDs. Annual per-constituent alpha = 0.1296. Individual comparison alpha = 0.007682 (1 of 2). Comparing 4 points to limit. Assumes 5 future values.

Constituent: Nickel Analysis Run 5/12/2023 11:54 AM View: 2023SSN - Interwell PL - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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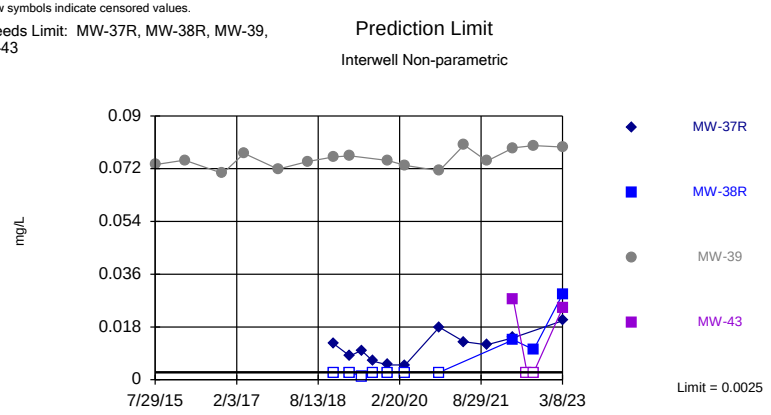
Hollow symbols indicate censored values.

Exceeds Limit: MW-37R, MW-38R, MW-39, MW-43



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 5 background values. 100% NDs. Annual per-constituent alpha = 0.3757. Individual comparison alpha = 0.02583 (1 of 2). Comparing 4 points to limit. Assumes 5 future values.

Constituent: Selenium Analysis Run 5/12/2023 11:54 AM View: 2023SSN - Interwell PL - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Interwell Prediction Limits Summary Table and Graphs – Dakota Sandstone

Prediction Limit

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS Printed 5/3/2023, 5:01 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/L)	**MW-11**	**0.00157**	**n/a**	**3/8/2023**	**0.0135**	**Yes**	**16**	**68.75**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**
Barium (mg/L)	**MW-11**	**0.3044**	**n/a**	**3/8/2023**	**0.745**	**Yes**	**16**	**0**	**No**	**0.00117**	**Param Inter 1 of 2**
Barium (mg/L)	MW-23	0.3044	n/a	3/8/2023	0.157	No	16	0	No	0.00117	Param Inter 1 of 2
Barium (mg/L)	MW-36	0.3044	n/a	3/8/2023	0.1265	No	16	0	No	0.00117	Param Inter 1 of 2
Cadmium (mg/L)	MW-11	0.000307	n/a	3/8/2023	0.000259	No	16	75	n/a	0.006129	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	**MW-36**	**0.000307**	**n/a**	**3/8/2023**	**0.000697**	**Yes**	**16**	**75**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-11**	**0.00138**	**n/a**	**3/8/2023**	**0.0134**	**Yes**	**16**	**75**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-36**	**0.00138**	**n/a**	**3/8/2023**	**0.001585**	**Yes**	**16**	**75**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**
Lead (mg/L)	MW-11	0.000765	n/a	3/8/2023	0.000534	No	16	68.75	n/a	0.006129	NP Inter (NDs) 1 of 2
Nickel (mg/L)	**MW-11**	**0.00447**	**n/a**	**3/8/2023**	**0.0188**	**Yes**	**16**	**87.5**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-36**	**0.00447**	**n/a**	**3/8/2023**	**0.00807**	**Yes**	**16**	**87.5**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**
Thallium (mg/L)	**MW-11**	**0.001**	**n/a**	**3/8/2023**	**0.00122**	**Yes**	**16**	**93.75**	**n/a**	**0.006129**	**NP Inter (NDs) 1 of 2**

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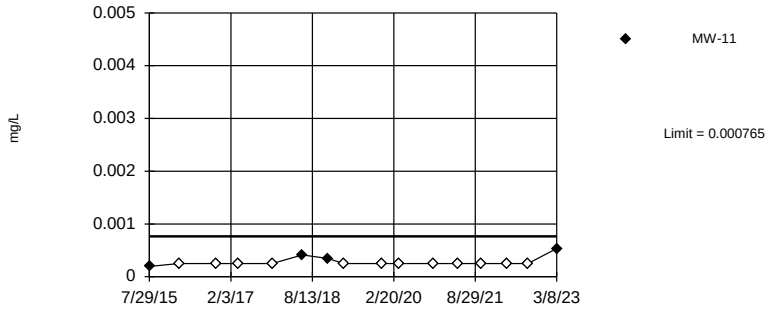
Hollow symbols indicate censored values.

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 16 background values. 68.75% NDs. Annual per-constituent alpha = 0.03622. Individual comparison alpha = 0.006129 (1 of 2). Assumes 2 future values.

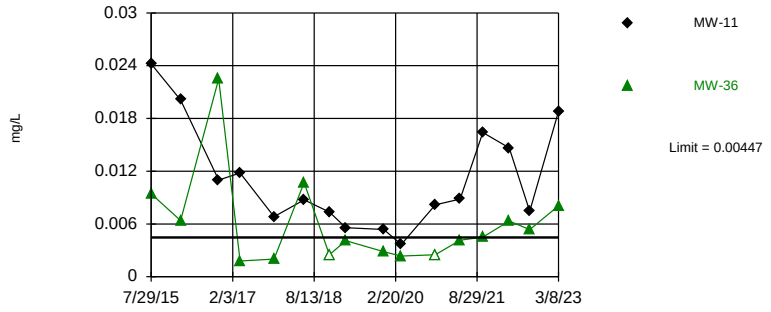
Constituent: Lead Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-11, MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 87.5% NDs. Annual per-constituent alpha = 0.03622. Individual comparison alpha = 0.006129 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

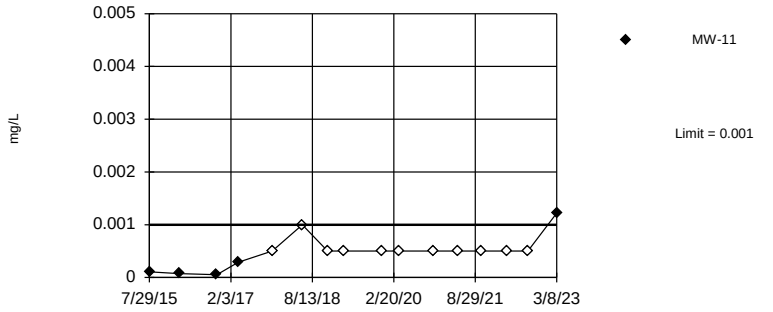
Constituent: Nickel Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-11

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 93.75% NDs. Annual per-constituent alpha = 0.03622. Individual comparison alpha = 0.006129 (1 of 2). Assumes 2 future values.

Constituent: Thallium Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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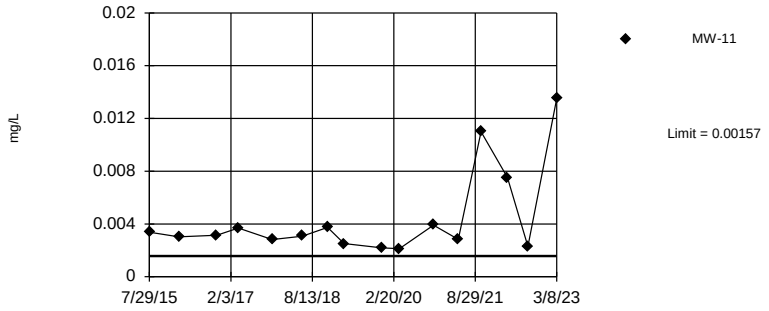
Exceeds Limit: MW-11

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 68.75% NDs. Annual per-constituent alpha = 0.03622. Individual comparison alpha = 0.006129 (1 of 2). Assumes 2 future values.

Constituent: Arsenic Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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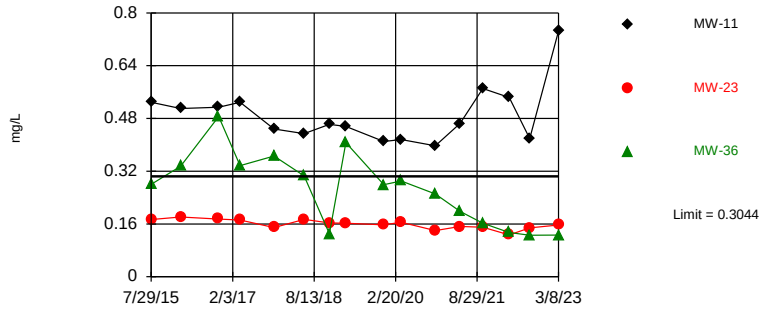
Exceeds Limit: MW-11

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2544, Std. Dev.=0.02241, n=16. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9553, critical = 0.844. Kappa = 2.23 (c=15, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.003506. Individual comparison alpha = 0.00117. Comparing 3 points to limit.

Constituent: Barium Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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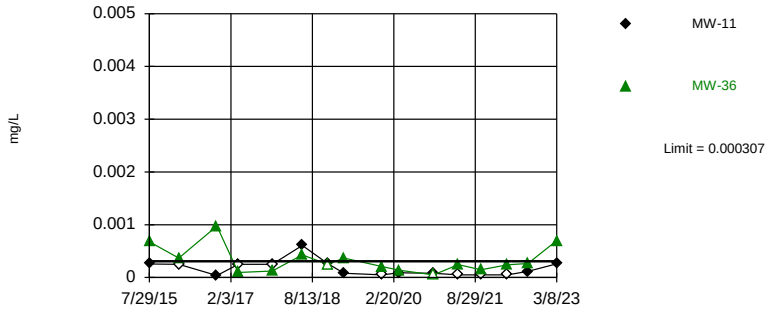
Hollow symbols indicate censored values.

Exceeds Limit: MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 75% NDs. Annual per-constituent alpha = 0.03622. Individual comparison alpha = 0.006129 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Cadmium Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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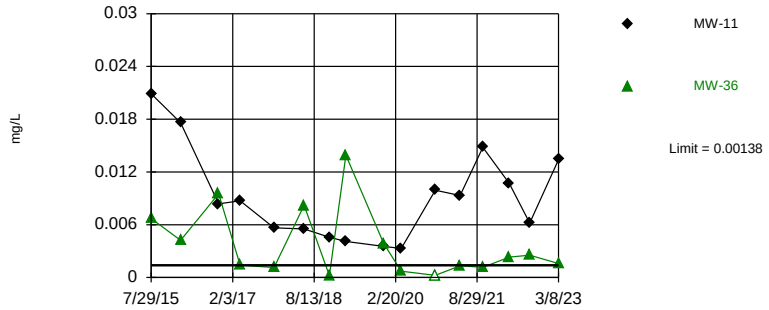
Hollow symbols indicate censored values.

Exceeds Limit: MW-11, MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 16 background values. 75% NDs. Annual per-constituent alpha = 0.03622. Individual comparison alpha = 0.006129 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Cobalt Analysis Run 5/3/2023 4:58 PM View: 2023 SSN Prediction Limits
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Mann-Kendall Trending Test Summary Table and Graphs – Water Table

Trend Test

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM Printed 5/12/2023, 4:17 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Acetone (ug/L)	MW-21	0	-7	-21	No	8	87.5	0.01	NP
Arsenic (mg/L)	MW-21	-0.0002682	-4	-21	No	8	0	0.01	NP
Arsenic (mg/L)	MW-24	-0.00033	-4	-21	No	8	0	0.01	NP
Barium (mg/L)	MW-19	0.06546	13	21	No	8	0	0.01	NP
Barium (mg/L)	MW-21	0.06001	8	21	No	8	0	0.01	NP
Barium (mg/L)	MW-24	0.005728	0	21	No	8	0	0.01	NP
Barium (mg/L)	MW-37R	0.0375	14	21	No	8	0	0.01	NP
Barium (mg/L)	**MW-38R**	**-0.1401**	**-22**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Barium (mg/L)	MW-39	0.001485	2	21	No	8	0	0.01	NP
Benzene (ug/L)	MW-19	0.1746	18	21	No	8	12.5	0.01	NP
Cadmium (mg/L)	MW-19	-0.000004287	-10	-21	No	8	62.5	0.01	NP
Cadmium (mg/L)	MW-24	-0.0008221	-6	-12	No	5	0	0.01	NP
Cadmium (mg/L)	MW-37R	-0.000003702	0	21	No	8	0	0.01	NP
Cadmium (mg/L)	MW-38R	-0.00009238	-20	-21	No	8	0	0.01	NP
Cadmium (mg/L)	MW-39	0	13	21	No	8	75	0.01	NP
Carbon Disulfide (ug/L)	MW-21	0	9	21	No	8	75	0.01	NP
Chlorobenzene (ug/L)	MW-19	0.4826	15	21	No	8	25	0.01	NP
Chlorobenzene (ug/L)	MW-24	0.1702	0	8	No	4	0	0.01	NP
Chromium (mg/L)	MW-38R	0	-1	-21	No	8	75	0.01	NP
Cobalt (mg/L)	MW-19	0.003069	18	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-21	0.001056	14	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-24	0.001102	11	18	No	7	0	0.01	NP
Cobalt (mg/L)	MW-37R	0.0004493	11	21	No	8	25	0.01	NP
Cobalt (mg/L)	MW-38R	-0.0009935	-16	-21	No	8	0	0.01	NP
gamma-Chlordane (ug/L)	MW-19	0	-1	-21	No	8	50	0.01	NP
Lead (mg/L)	MW-37R	0.0008659	10	21	No	8	25	0.01	NP
Lead (mg/L)	MW-38R	0.00001281	1	21	No	8	25	0.01	NP
Nickel (mg/L)	MW-19	0.001374	8	21	No	8	0	0.01	NP
Nickel (mg/L)	MW-21	0.0004896	14	21	No	8	12.5	0.01	NP
Nickel (mg/L)	MW-24	0.005188	12	21	No	8	0	0.01	NP
Nickel (mg/L)	MW-37R	-0.0009552	-10	-21	No	8	0	0.01	NP
Nickel (mg/L)	**MW-38R**	**-0.002162**	**-22**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Selenium (mg/L)	MW-37R	0.004606	16	21	No	8	0	0.01	NP
Selenium (mg/L)	MW-38R	0.00374	12	21	No	8	50	0.01	NP
Selenium (mg/L)	MW-39	0.001986	10	21	No	8	0	0.01	NP
Sulfide (mg/L)	MW-21	-0.07014	-12	-21	No	8	50	0.01	NP
Toluene (ug/L)	MW-21	0	-11	-21	No	8	75	0.01	NP
Toluene (ug/L)	MW-37R	0	-1	-21	No	8	87.5	0.01	NP
Toluene (ug/L)	MW-38R	0	1	21	No	8	75	0.01	NP
Vanadium (mg/L)	MW-37R	0.001109	8	21	No	8	0	0.01	NP
Xylenes, total (ug/L)	MW-37R	0	-1	-21	No	8	87.5	0.01	NP
Xylenes, total (ug/L)	MW-38R	0	-3	-21	No	8	75	0.01	NP

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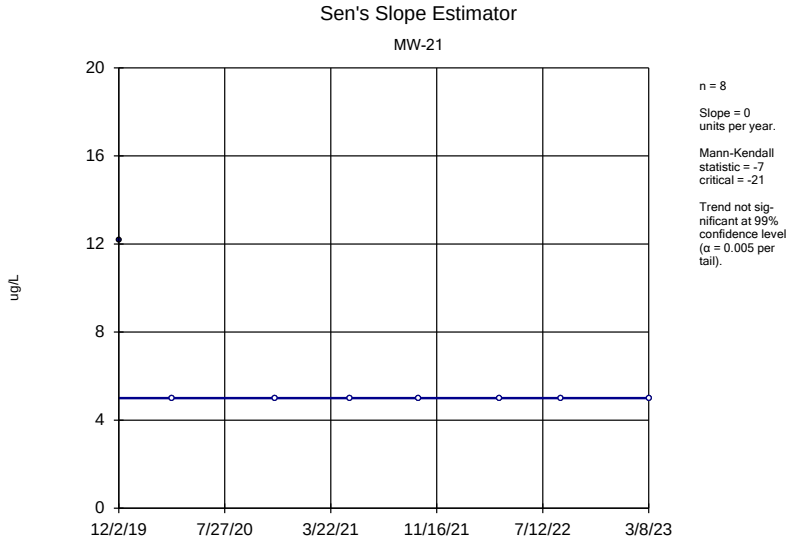
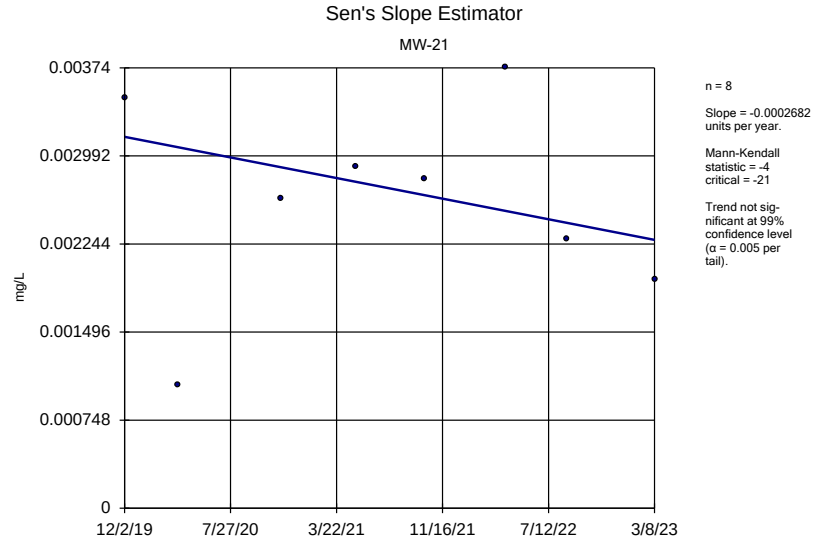
Hollow symbols indicate censored values.



Constituent: Acetone Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG



Constituent: Arsenic Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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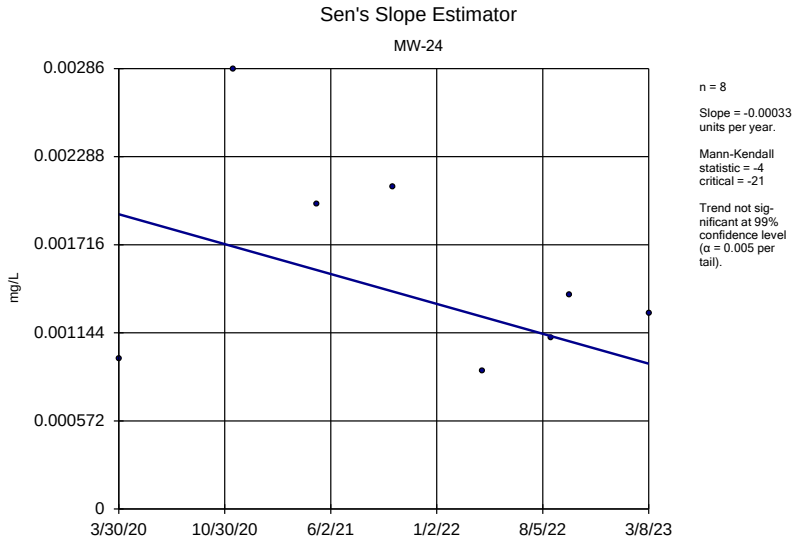

Constituent: Arsenic Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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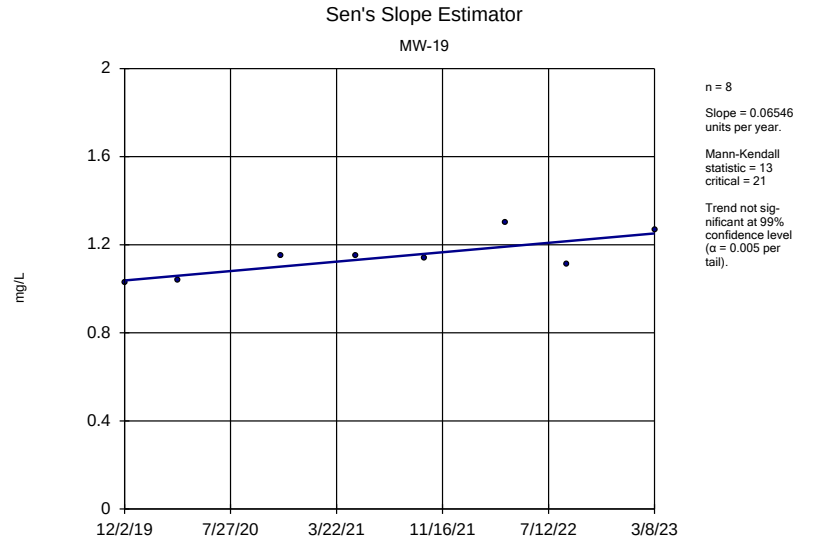

Constituent: Barium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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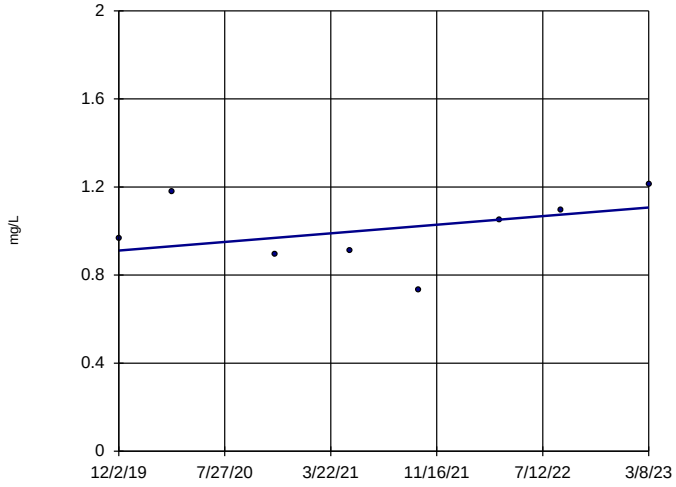
Sen's Slope Estimator

MW-21



n = 8

Slope = 0.06001 units per year.

Mann-Kendall statistic = 8 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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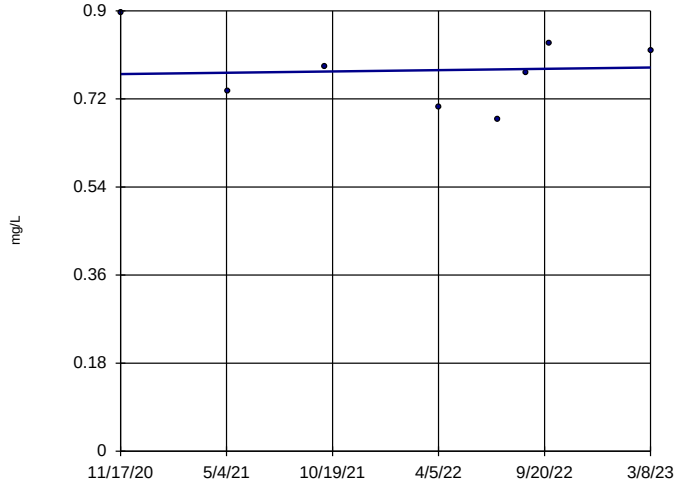
Sen's Slope Estimator

MW-24



n = 8

Slope = 0.005728 units per year.

Mann-Kendall statistic = 0 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

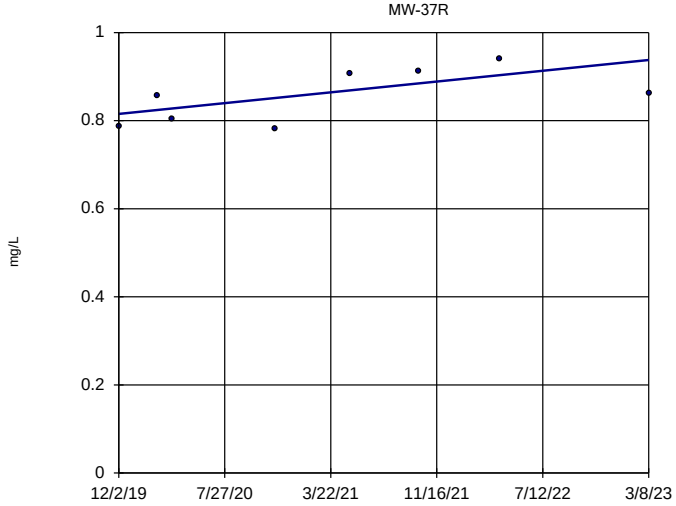
Constituent: Barium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.0375 units per year.

Mann-Kendall statistic = 14 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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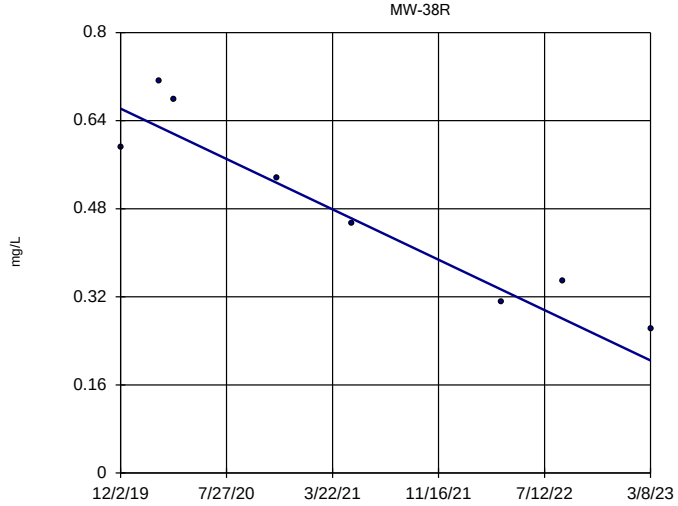
Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.1401 units per year.

Mann-Kendall statistic = -22 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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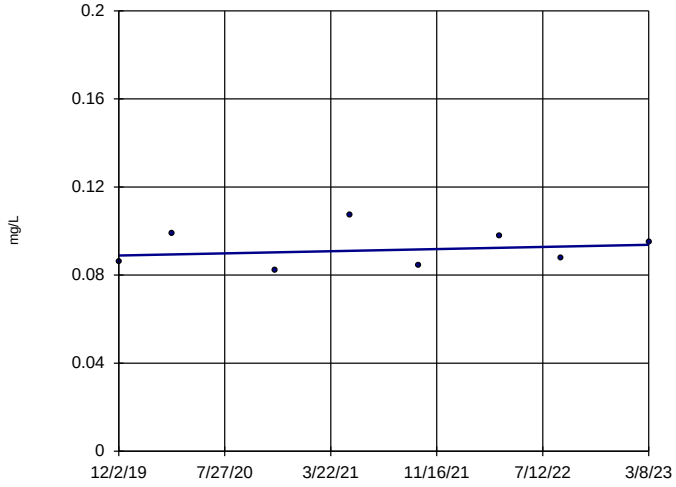
Sen's Slope Estimator

MW-39



n = 8

Slope = 0.001485 units per year.

Mann-Kendall statistic = 2 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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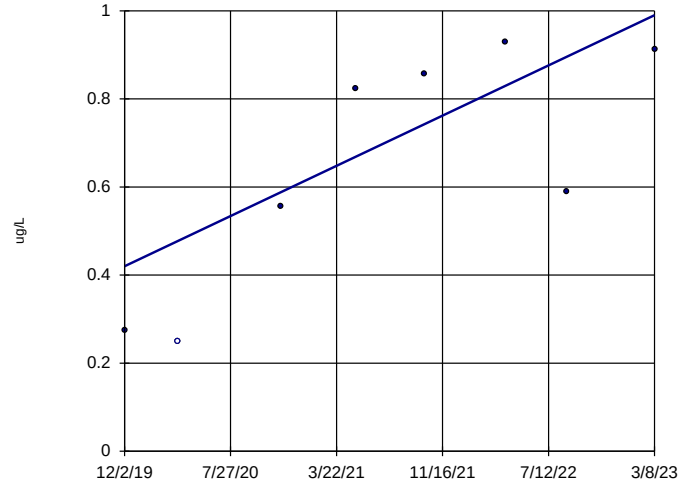
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0.1746 units per year.

Mann-Kendall statistic = 18 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Benzene Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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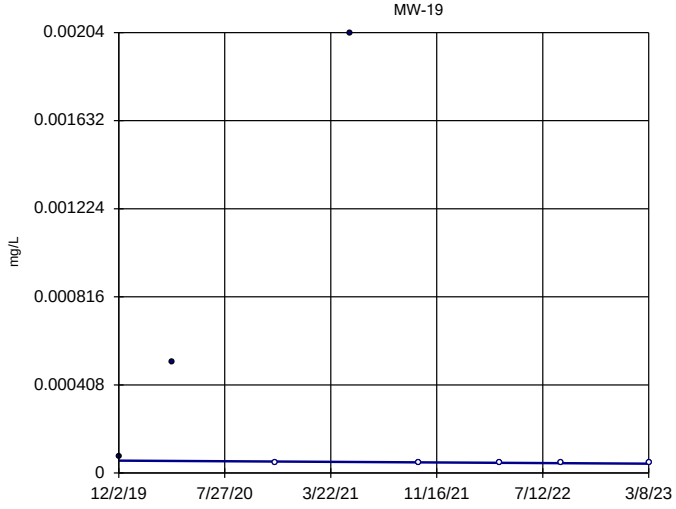
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = -0.000004287 units per year.

Mann-Kendall statistic = -10 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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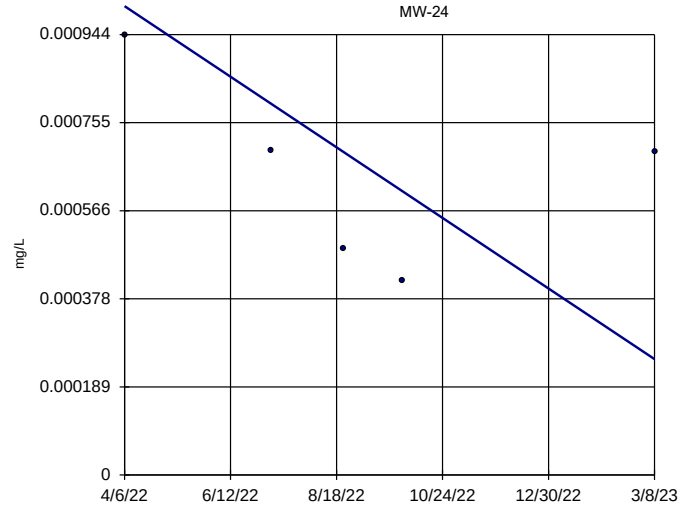
Sen's Slope Estimator

MW-24



n = 5

Slope = -0.0008221 units per year.

Mann-Kendall statistic = -6 critical = -12

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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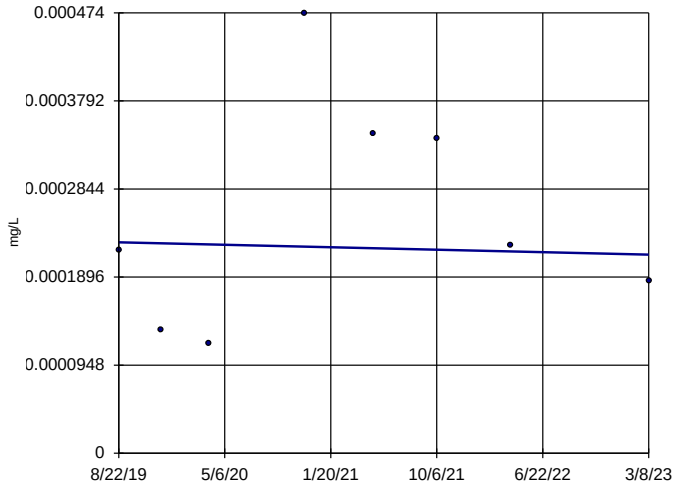
Sen's Slope Estimator

MW-37R



n = 8

Slope = -0.000003702 units per year.

Mann-Kendall statistic = 0 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

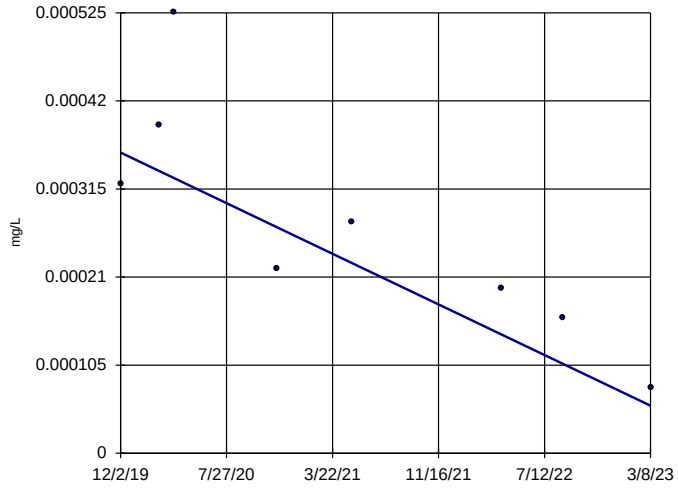
Constituent: Cadmium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.00009238 units per year.

Mann-Kendall statistic = -20 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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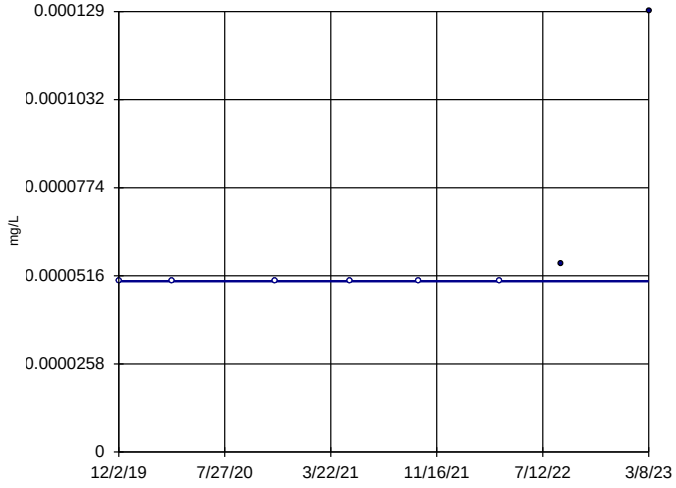
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-39



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 13 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

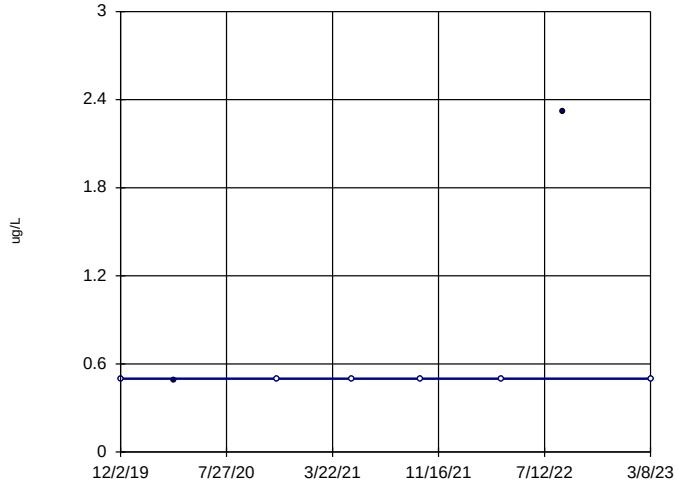
Constituent: Cadmium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 9 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Carbon Disulfide Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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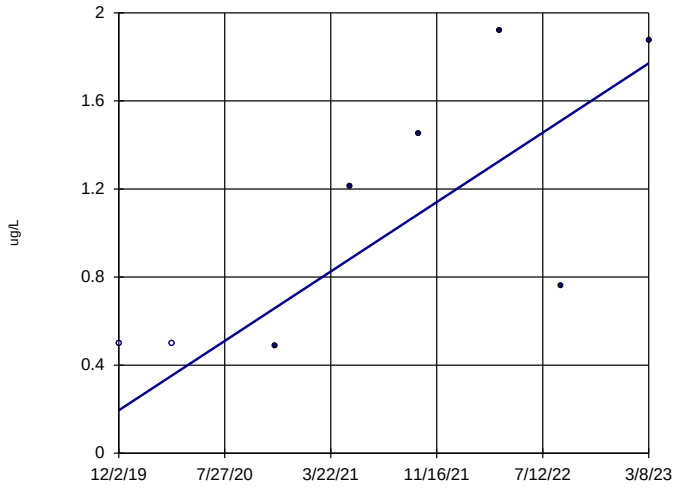
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0.4826 units per year.

Mann-Kendall statistic = 15 critical = 21

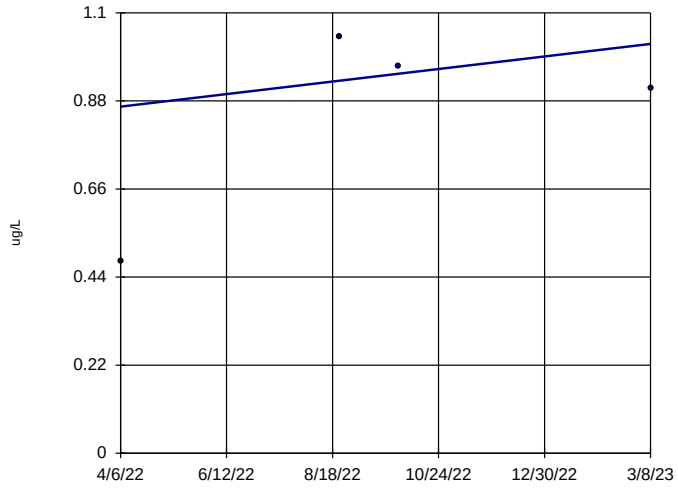
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chlorobenzene Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-24



n = 4

Slope = 0.1702 units per year.

Mann-Kendall statistic = 0 critical = 8

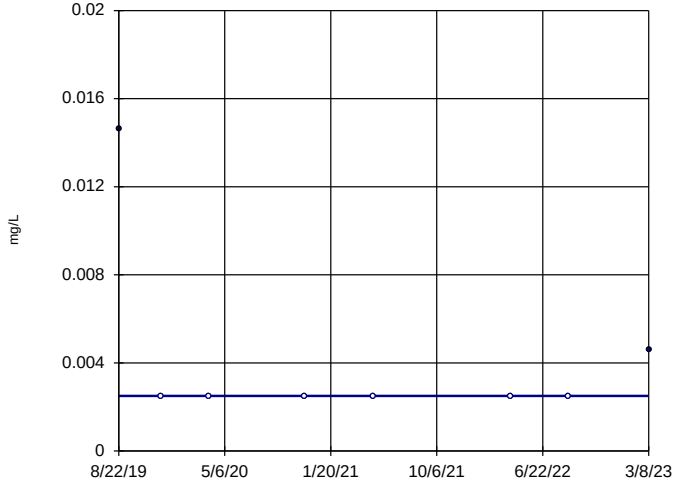
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chlorobenzene Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -1 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chromium Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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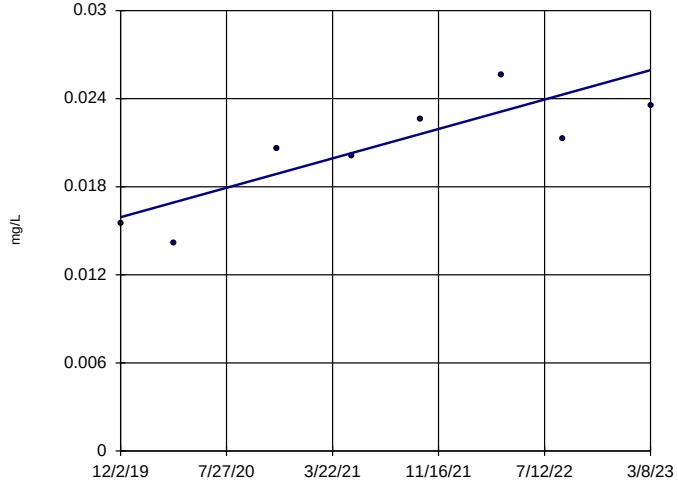
Sen's Slope Estimator

MW-19



n = 8

Slope = 0.003069 units per year.

Mann-Kendall statistic = 18 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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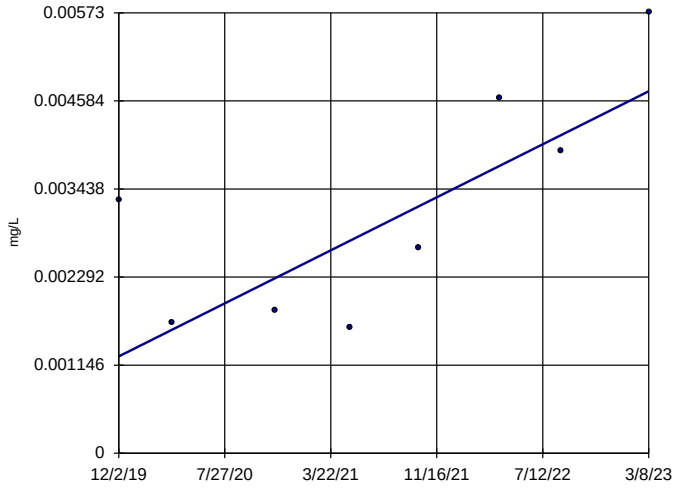
Sen's Slope Estimator

MW-21



n = 8

Slope = 0.001056 units per year.

Mann-Kendall statistic = 14 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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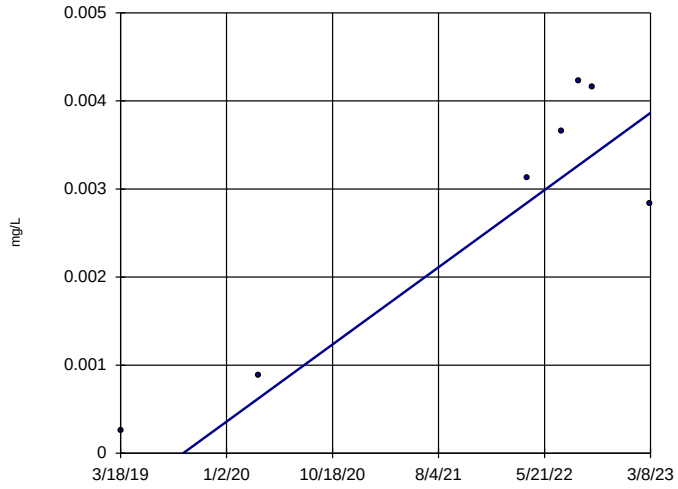
Sen's Slope Estimator

MW-24



n = 7

Slope = 0.001102 units per year.

Mann-Kendall statistic = 11 critical = 18

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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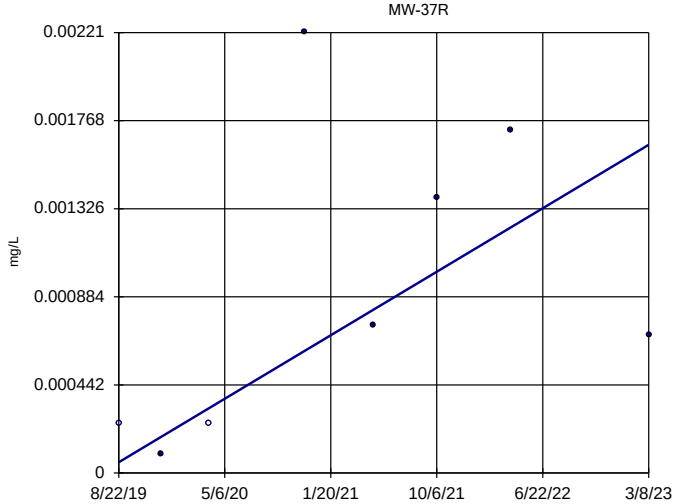
Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.0004493 units per year.

Mann-Kendall statistic = 11 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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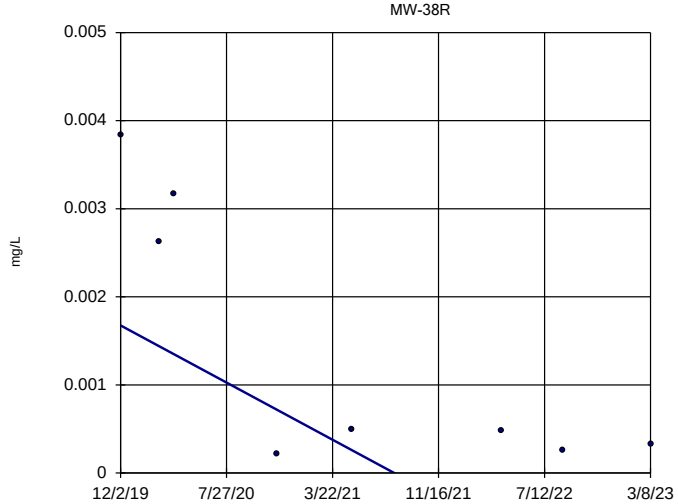
Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.0009935 units per year.

Mann-Kendall statistic = -16 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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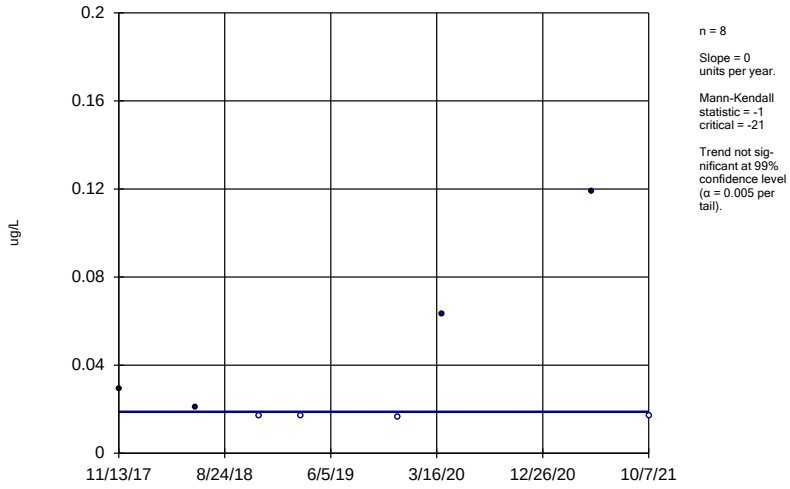
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -1
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: gamma-Chlordane Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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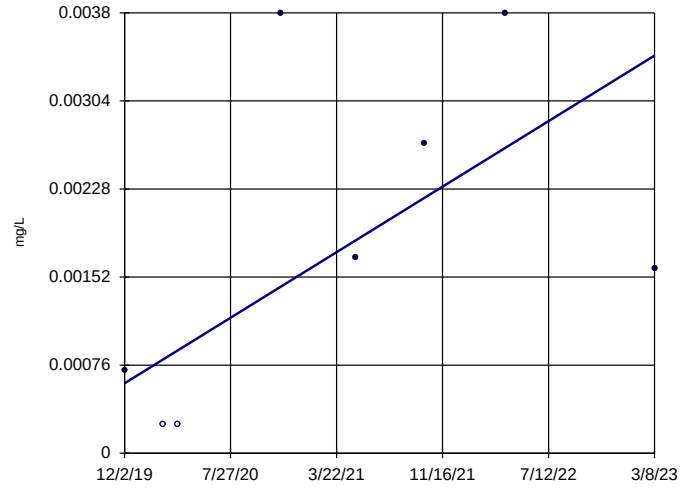
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.0008659
units per year.

Mann-Kendall
statistic = 10
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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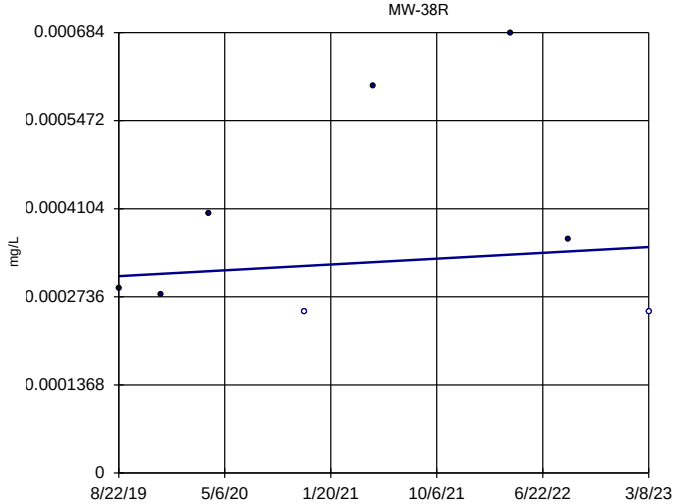
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0.00001281
units per year.

Mann-Kendall
statistic = 1
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Lead Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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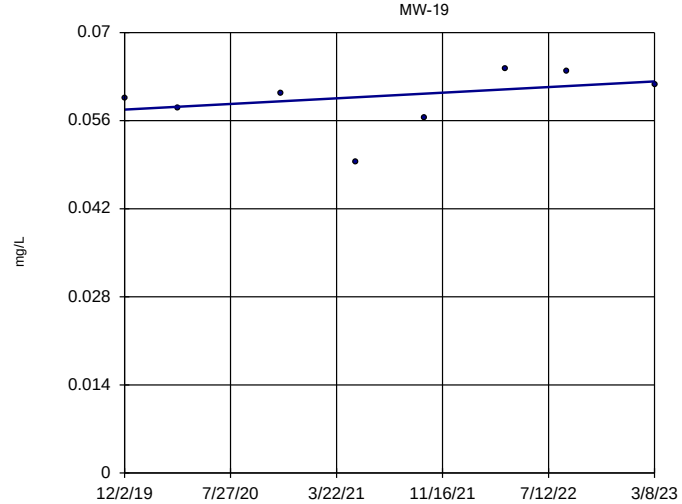
Sen's Slope Estimator

MW-19



n = 8

Slope = 0.001374
units per year.

Mann-Kendall
statistic = 8
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Nickel Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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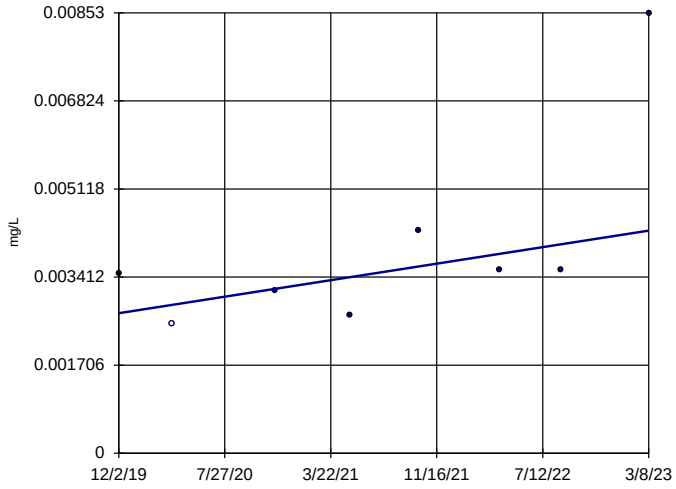
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = 0.0004896 units per year.

Mann-Kendall statistic = 14 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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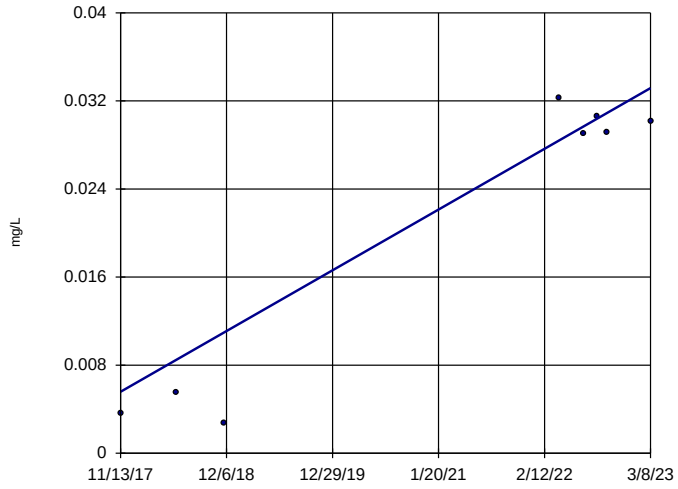
Sen's Slope Estimator

MW-24



n = 8

Slope = 0.005188 units per year.

Mann-Kendall statistic = 12 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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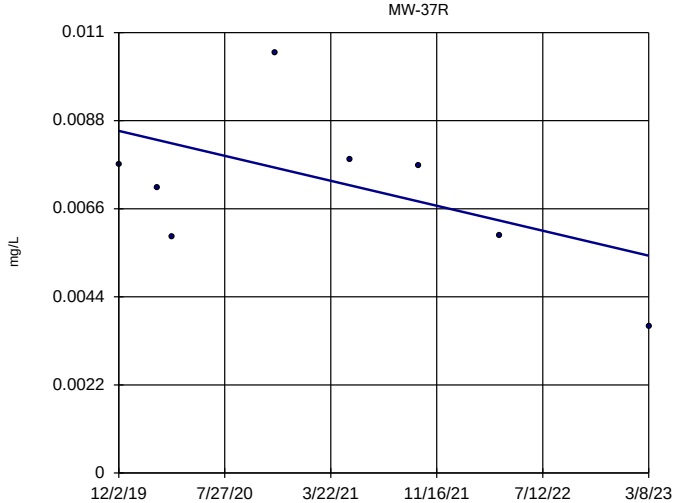
Sen's Slope Estimator

MW-37R



n = 8

Slope = -0.0009552 units per year.

Mann-Kendall statistic = -10 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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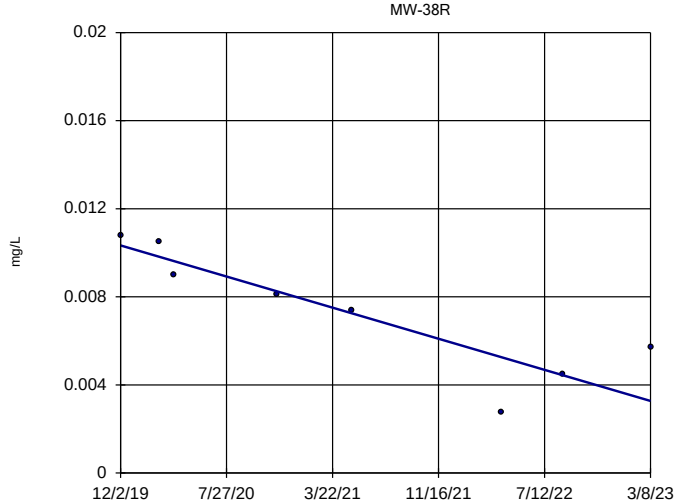
Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.002162 units per year.

Mann-Kendall statistic = -22 critical = -21

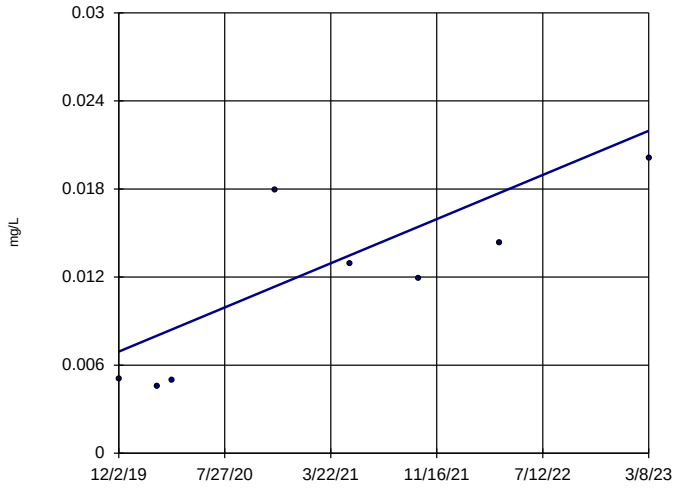
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 5/12/2023 4:13 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.004606 units per year.

Mann-Kendall statistic = 16 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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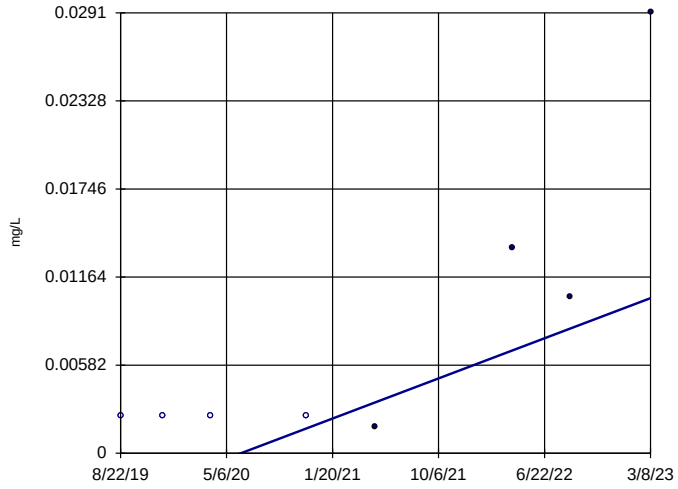
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0.00374 units per year.

Mann-Kendall statistic = 12 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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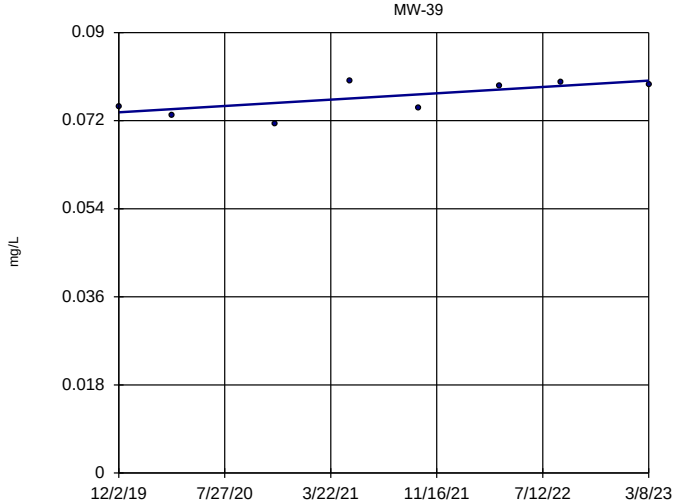
Sen's Slope Estimator

MW-39



n = 8

Slope = 0.001986 units per year.

Mann-Kendall statistic = 10 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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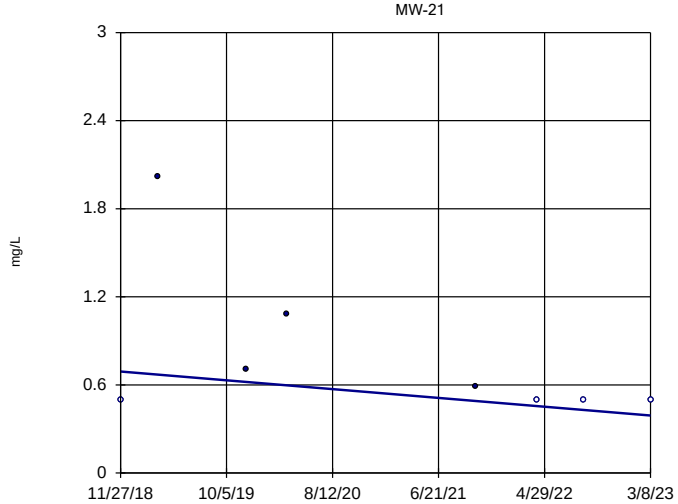
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = -0.07014 units per year.

Mann-Kendall statistic = -12 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfide Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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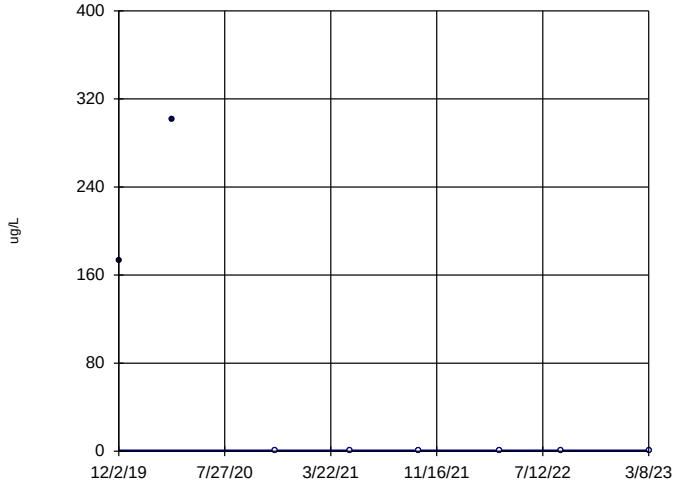
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -11
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Toluene Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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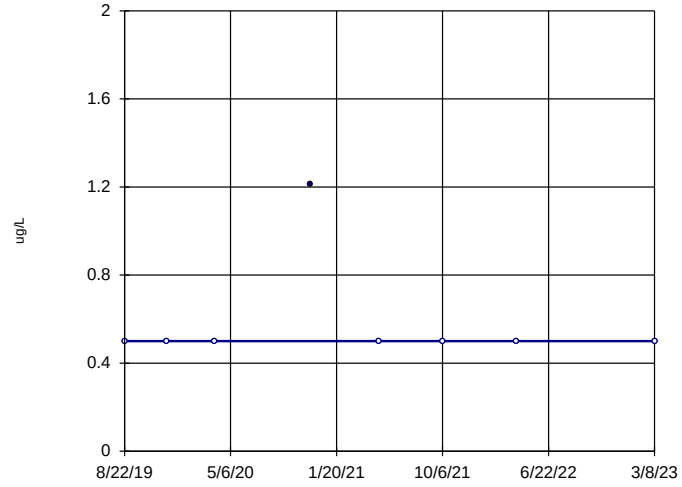
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -1
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Toluene Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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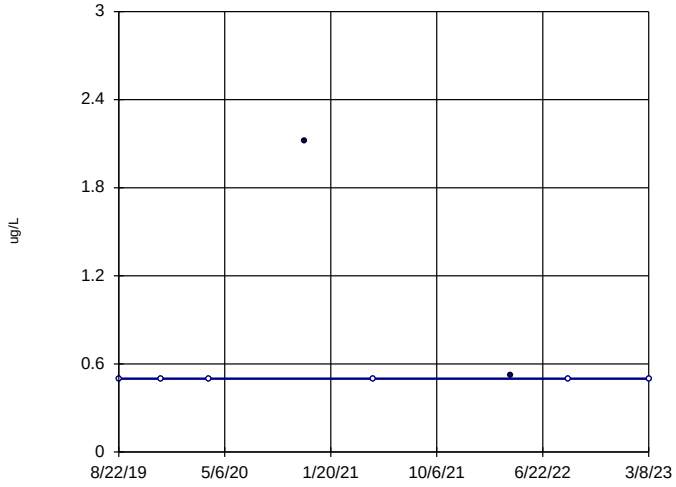
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 1
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Toluene Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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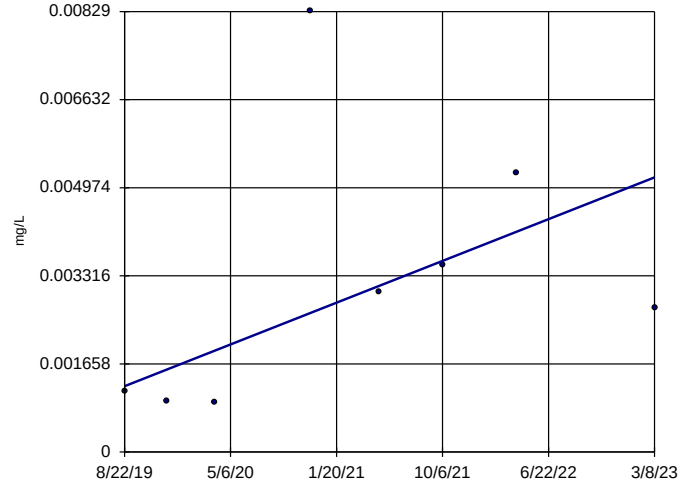
Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.001109
units per year.

Mann-Kendall
statistic = 8
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Vanadium Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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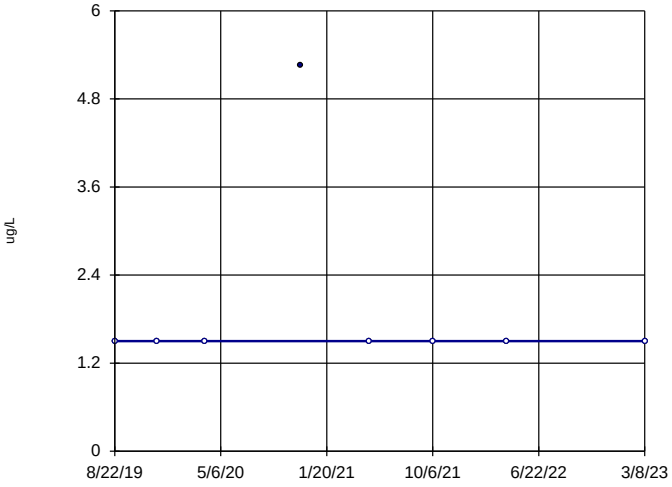
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -1
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Xylenes, total Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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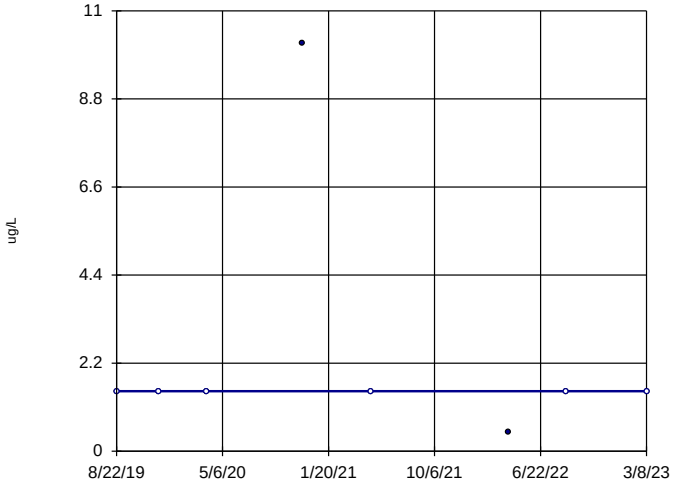
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -3
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Xylenes, total Analysis Run 5/12/2023 4:14 PM View: 2023SSN - Mann Kendall - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Mann-Kendall Trending Test Summary Table and Graphs – Dakota Sandstone

Trend Test

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN Printed 5/12/2023, 5:14 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Antimony (mg/L)	MW-23	0	4	21	No	8	75	0.01	NP
Antimony (mg/L)	MW-36	0	7	21	No	8	87.5	0.01	NP
Arsenic (mg/L)	MW-11	0.002447	14	21	No	8	0	0.01	NP
Barium (mg/L)	MW-11	0.07434	16	21	No	8	0	0.01	NP
Barium (mg/L)	MW-23	-0.003475	-8	-21	No	8	0	0.01	NP
Barium (mg/L)	**MW-36**	**-0.05661**	**-24**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Cadmium (mg/L)	MW-11	0.00001534	8	21	No	8	50	0.01	NP
Cadmium (mg/L)	MW-36	0.00007872	16	21	No	8	12.5	0.01	NP
Cobalt (mg/L)	MW-11	0.002576	12	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-36	0.0002978	6	21	No	8	12.5	0.01	NP
Copper (mg/L)	MW-36	0	5	21	No	8	87.5	0.01	NP
Lead (mg/L)	MW-11	0	7	21	No	8	87.5	0.01	NP
Lead (mg/L)	MW-36	0	2	21	No	8	50	0.01	NP
Nickel (mg/L)	MW-11	0.00431	16	21	No	8	0	0.01	NP
Nickel (mg/L)	**MW-36**	**0.001608**	**22**	**21**	**Yes**	**8**	**12.5**	**0.01**	**NP**
Thallium (mg/L)	MW-11	0	7	21	No	8	87.5	0.01	NP

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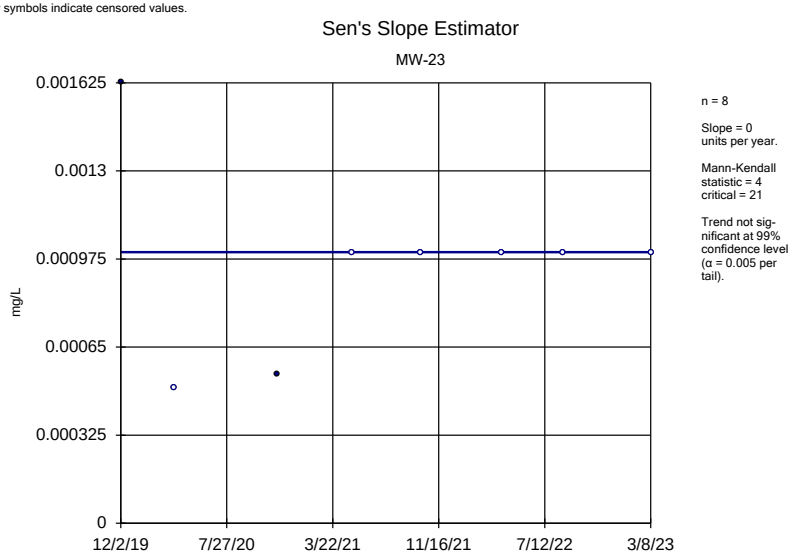
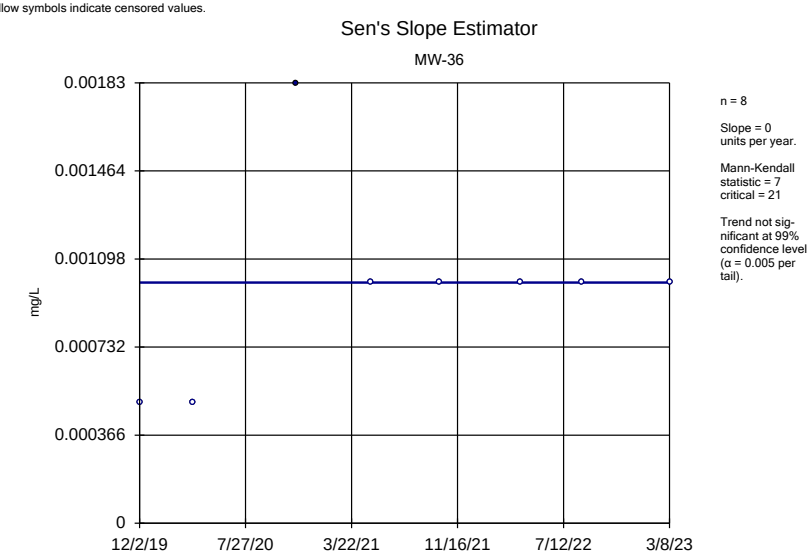
Hollow symbols indicate censored values.



Constituent: Antimony Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Antimony Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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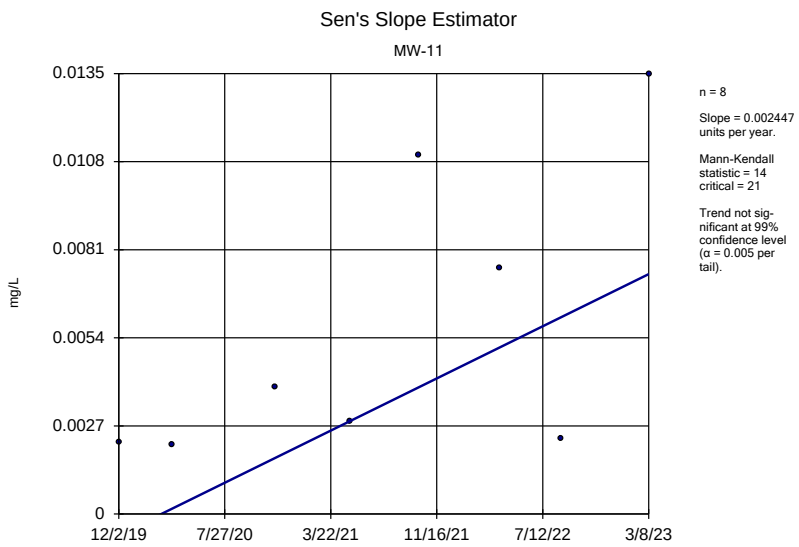
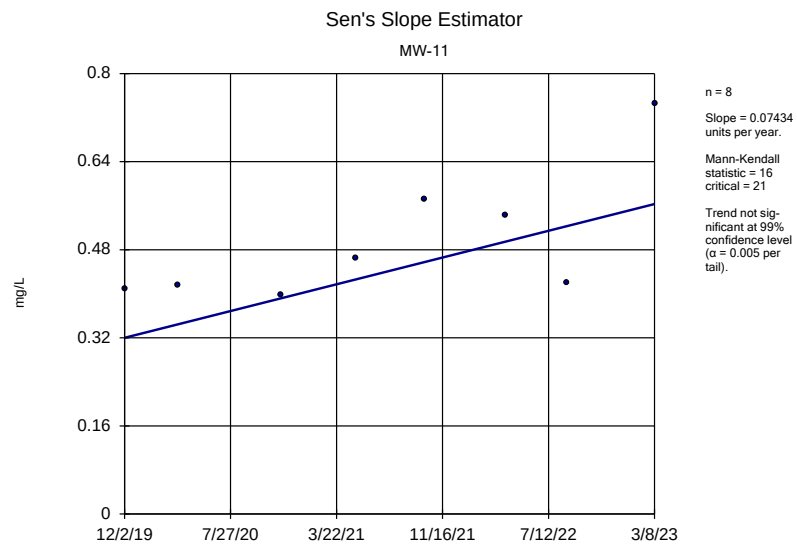


Constituent: Arsenic Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG



Constituent: Barium Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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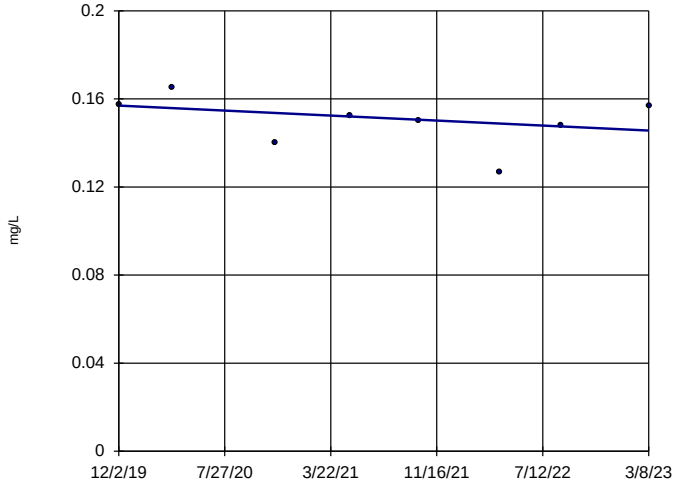
Sen's Slope Estimator

MW-23



n = 8

Slope = -0.003475 units per year.

Mann-Kendall statistic = -8 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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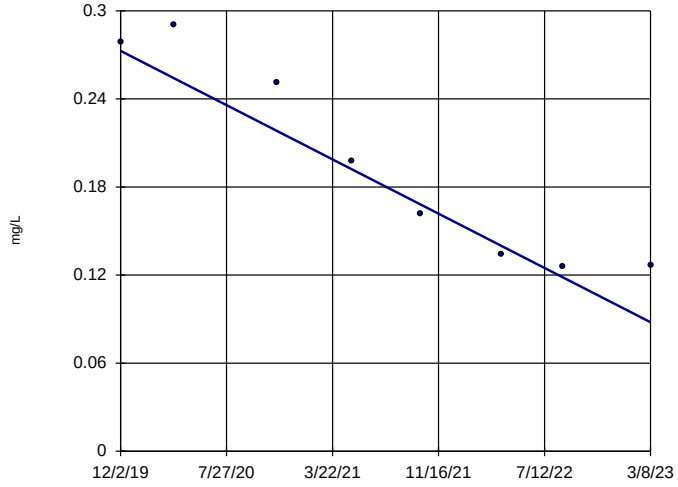
Sen's Slope Estimator

MW-36



n = 8

Slope = -0.05661 units per year.

Mann-Kendall statistic = -24 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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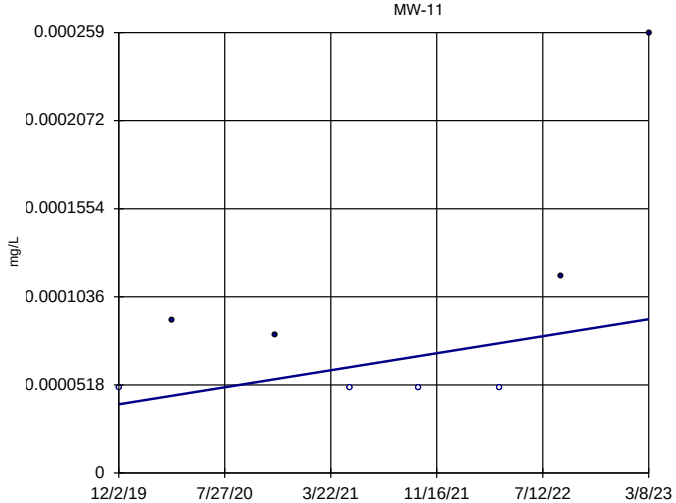
Sen's Slope Estimator

MW-11



n = 8

Slope = 0.00001534 units per year.

Mann-Kendall statistic = 8 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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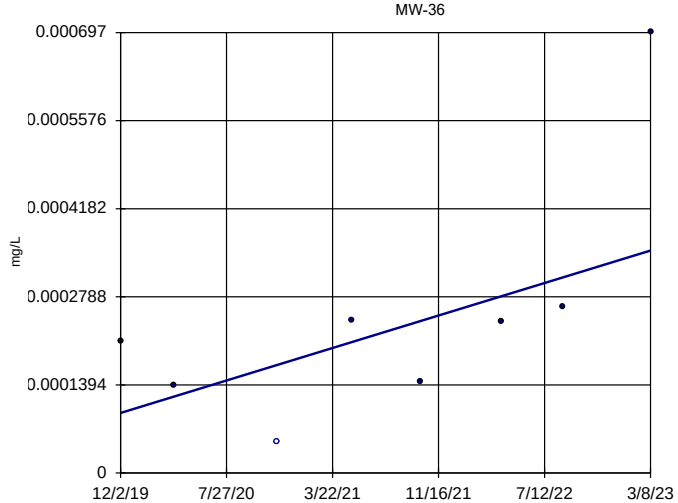
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0.00007872 units per year.

Mann-Kendall statistic = 16 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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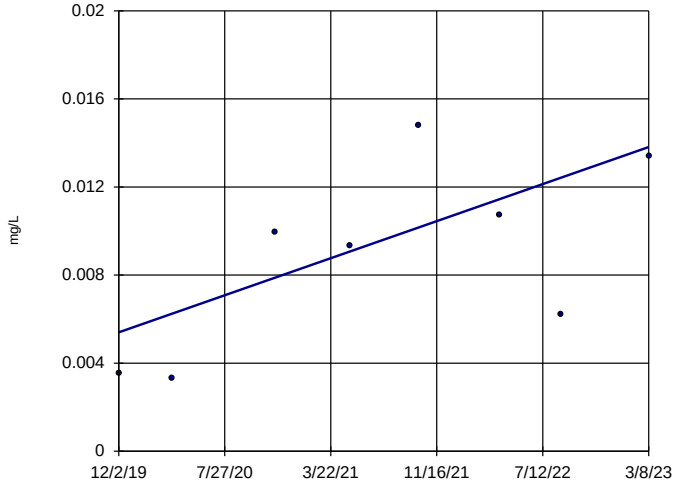
Sen's Slope Estimator

MW-11



n = 8

Slope = 0.002576 units per year.

Mann-Kendall statistic = 12 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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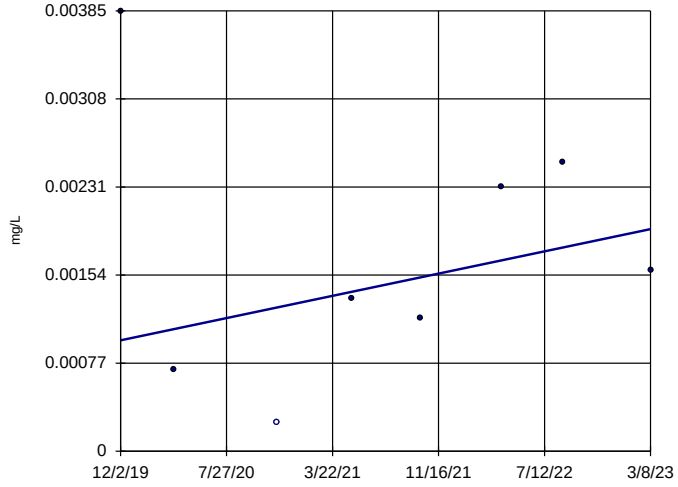
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0.0002978 units per year.

Mann-Kendall statistic = 6 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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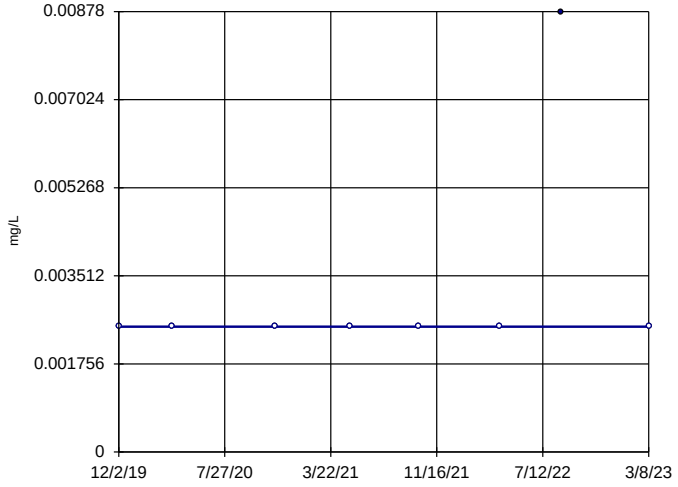
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 5 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Copper Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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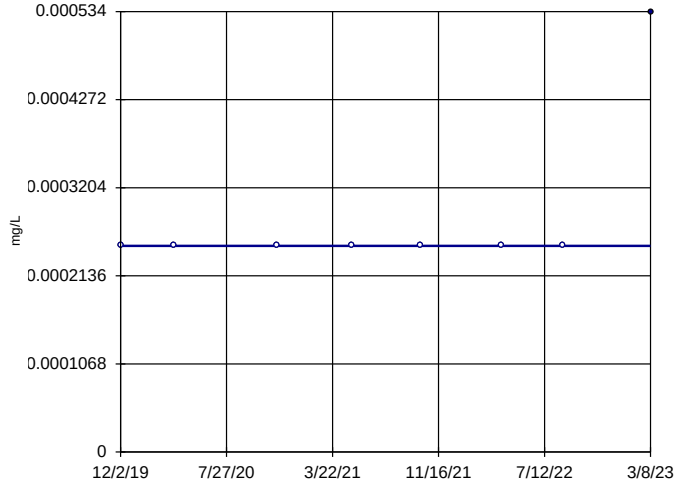
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-11



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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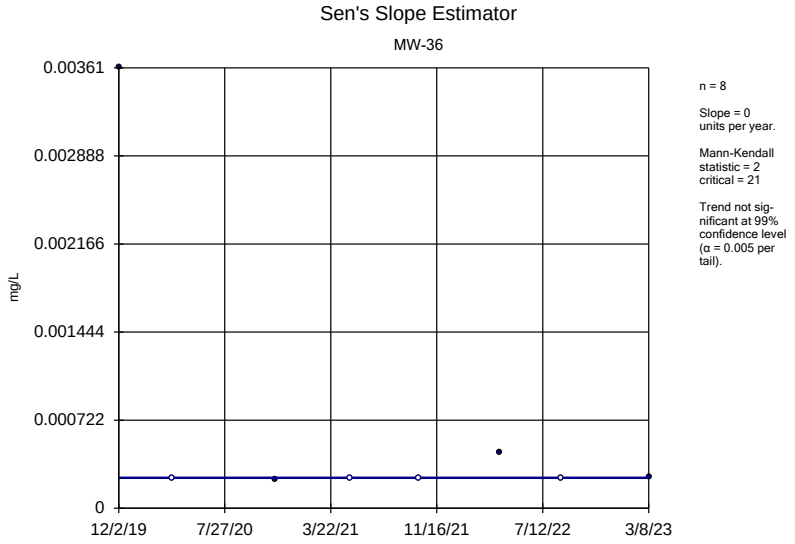
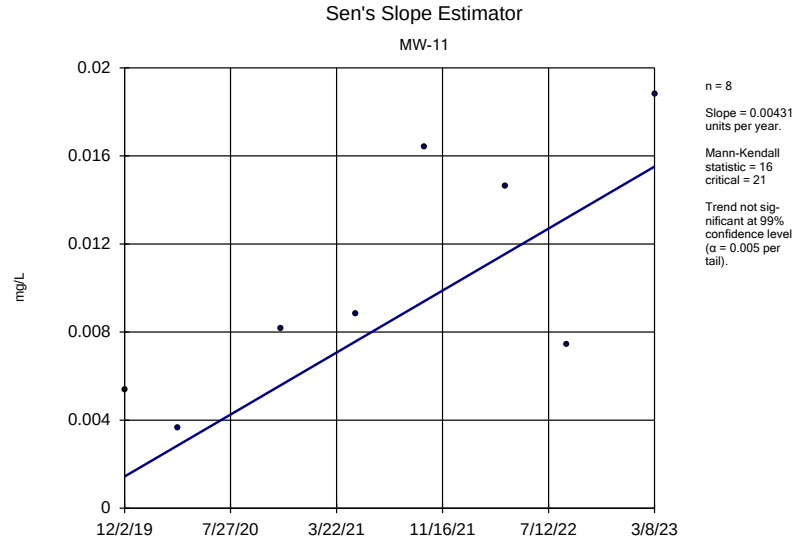
Hollow symbols indicate censored values.



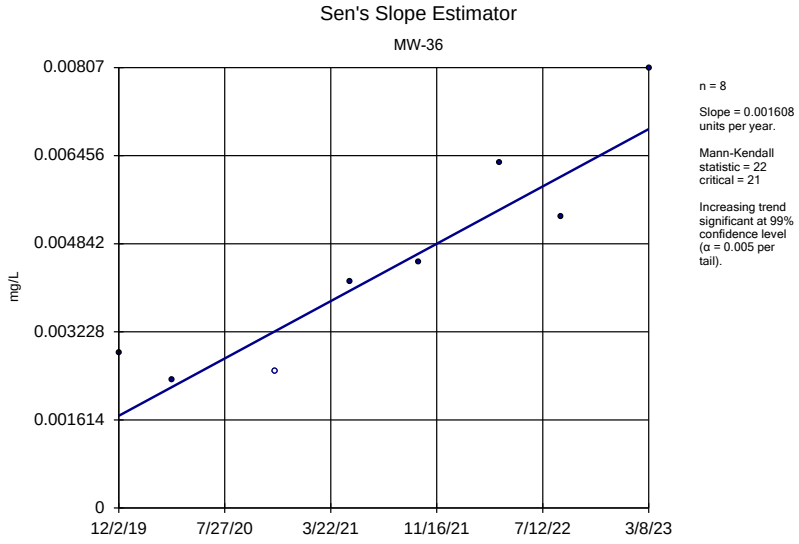
Constituent: Lead Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG



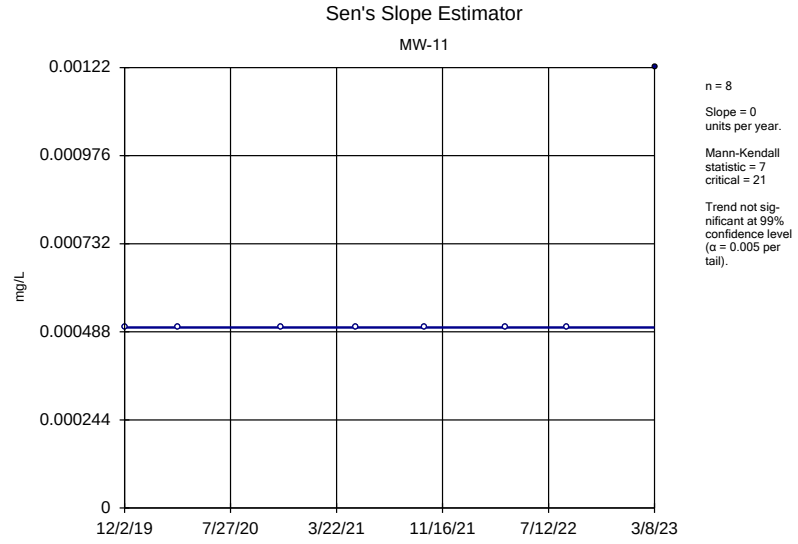
Constituent: Nickel Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Nickel Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Thallium Analysis Run 5/12/2023 5:13 PM View: 2023SSN - Mann Kendall - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Confidence Interval Summary Table and Graphs – Water Table

Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM Printed 5/12/2023, 4:41 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Acetone (ug/L)	MW-21	12.2	5	6300	No	8	87.5	No	0.004	NP (NDs)
Arsenic (mg/L)	MW-21	0.003512	0.001695	0.01	No	8	0	No	0.01	Param.
Arsenic (mg/L)	MW-24	0.002293	0.0008489	0.01	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-19	1.251	1.047	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-21	1.175	0.8352	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-24	0.8543	0.7017	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-37R	0.9204	0.7916	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-39	0.1014	0.08328	2	No	8	0	No	0.01	Param.
Benzene (ug/L)	MW-19	0.9414	0.3566	5	No	8	12.5	No	0.01	Param.
Cadmium (mg/L)	MW-19	0.00204	0.00005	0.005	No	8	62.5	No	0.004	NP (NDs)
Cadmium (mg/L)	MW-24	0.0009941	0.0002995	0.005	No	5	0	No	0.01	Param.
Cadmium (mg/L)	MW-37R	0.0003837	0.0001257	0.005	No	8	0	No	0.01	Param.
Cadmium (mg/L)	MW-38R	0.0004204	0.0001218	0.005	No	8	0	No	0.01	Param.
Cadmium (mg/L)	MW-39	0.000129	0.00005	0.005	No	8	75	No	0.004	NP (NDs)
Carbon Disulfide (ug/L)	MW-21	2.315	0.493	700	No	8	75	No	0.004	NP (NDs)
Chlorobenzene (ug/L)	MW-19	1.698	0.5411	100	No	8	25	No	0.01	Param.
Chlorobenzene (ug/L)	MW-24	1.421	0.2775	100	No	4	0	No	0.01	Param.
Chromium (mg/L)	MW-38R	0.0146	0.0025	0.1	No	8	75	No	0.004	NP (NDs)
Cobalt (mg/L)	MW-19	0.02454	0.01632	0.04962	No	8	0	No	0.01	Param.
Cobalt (mg/L)	MW-21	0.004772	0.001595	0.04962	No	8	0	No	0.01	Param.
Cobalt (mg/L)	MW-24	0.004604	0.0008678	0.04962	No	7	0	No	0.01	Param.
Cobalt (mg/L)	MW-37R	0.001685	0.00007374	0.04962	No	8	25	No	0.01	Param.
Cobalt (mg/L)	MW-38R	0.003033	-0.0001817	0.04962	No	8	0	No	0.01	Param.
gamma-Chlordane (ug/L)	MW-19	0.119	0.0164	2	No	8	50	No	0.004	NP (normality)
Lead (mg/L)	MW-37R	0.002773	0.0004128	0.015	No	8	25	No	0.01	Param.
Lead (mg/L)	MW-38R	0.0005618	0.0002582	0.015	No	8	25	No	0.01	Param.
Nickel (mg/L)	MW-19	0.06425	0.05418	0.1	No	8	0	No	0.01	Param.
Nickel (mg/L)	MW-21	0.00853	0.0025	0.1	No	8	12.5	No	0.004	NP (normality)
Nickel (mg/L)	MW-24	0.0323	0.00272	0.1	No	8	0	No	0.004	NP (normality)
Nickel (mg/L)	MW-37R	0.009141	0.004945	0.1	No	8	0	No	0.01	Param.
Selenium (mg/L)	MW-37R	0.01789	0.005053	0.05	No	8	0	No	0.01	Param.
Selenium (mg/L)	MW-38R	0.0291	0.00177	0.05	No	8	50	No	0.004	NP (normality)
Selenium (mg/L)	**MW-39**	**0.08023**	**0.07285**	**0.05**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Sulfide (mg/L)	MW-21	2.02	0.5	1	No	8	50	No	0.004	NP (normality)
Toluene (ug/L)	MW-21	301.5	0.5	1000	No	8	75	No	0.004	NP (NDs)
Toluene (ug/L)	MW-37R	1.21	0.5	1000	No	8	87.5	No	0.004	NP (NDs)
Toluene (ug/L)	MW-38R	2.12	0.5	1000	No	8	75	No	0.004	NP (NDs)
Vanadium (mg/L)	MW-37R	0.005914	0.0005437	0.035	No	8	0	No	0.01	Param.
Xylenes, total (ug/L)	MW-37R	5.25	1.5	10000	No	8	87.5	No	0.004	NP (NDs)
Xylenes, total (ug/L)	MW-38R	10.2	0.461	10000	No	8	75	No	0.004	NP (NDs)

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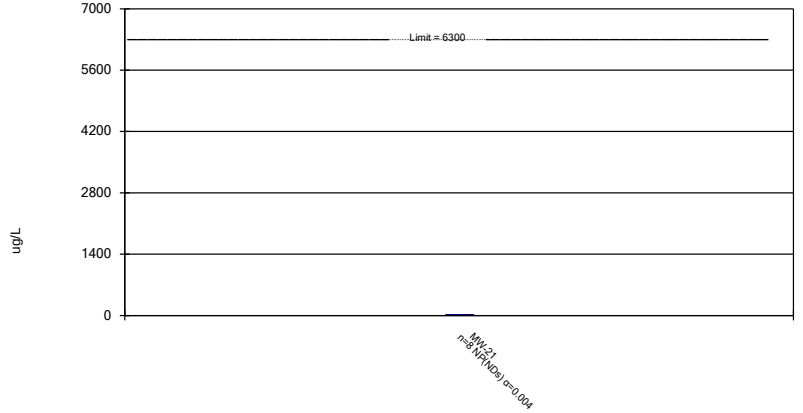
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

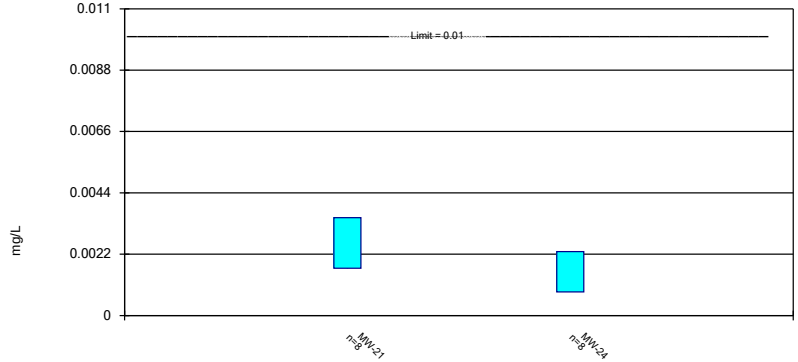


Constituent: Acetone Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Arsenic Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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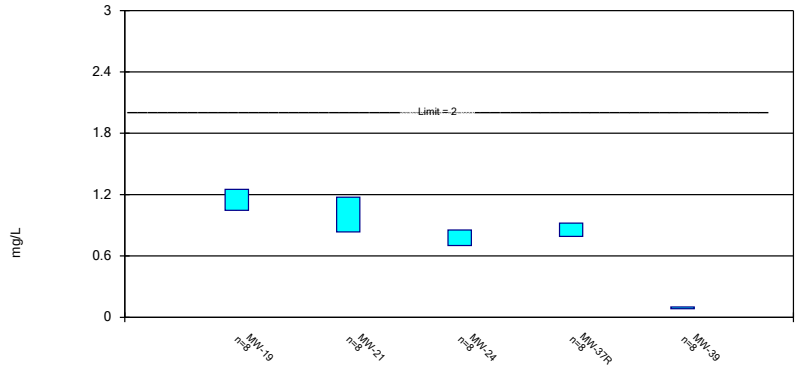
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Barium Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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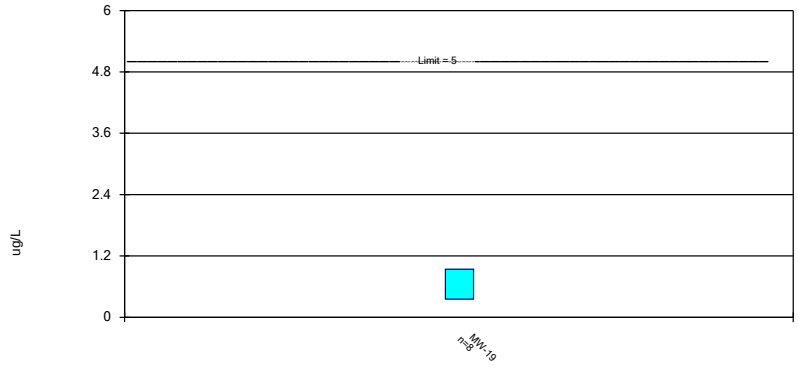
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.

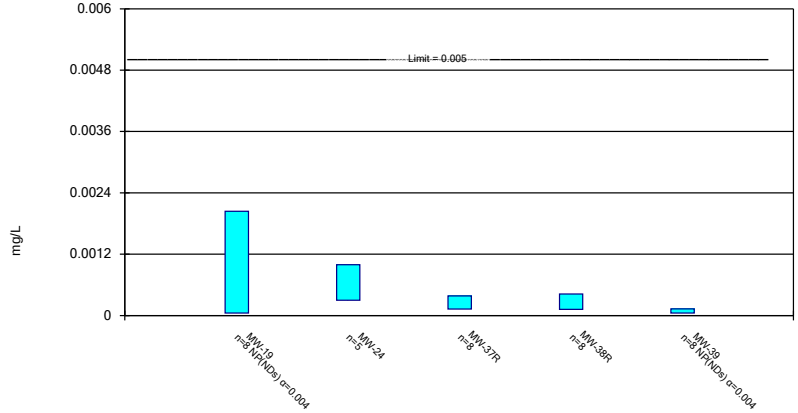


Constituent: Benzene Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cadmium Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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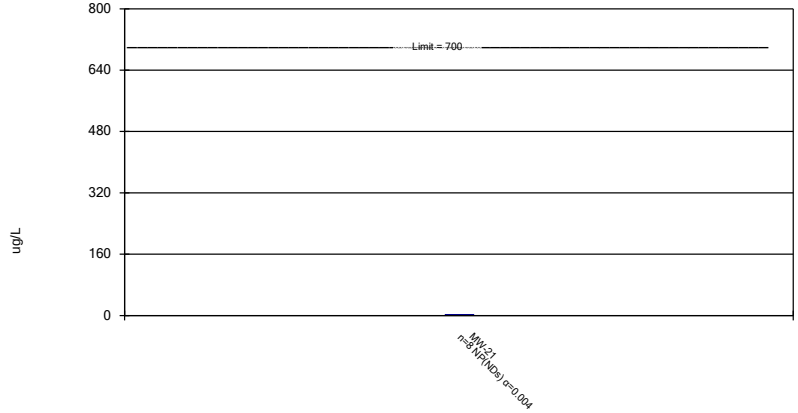
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Carbon Disulfide Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - W
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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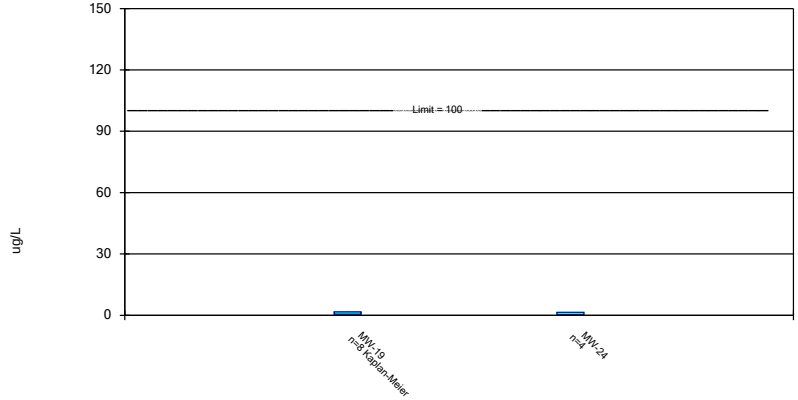
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.

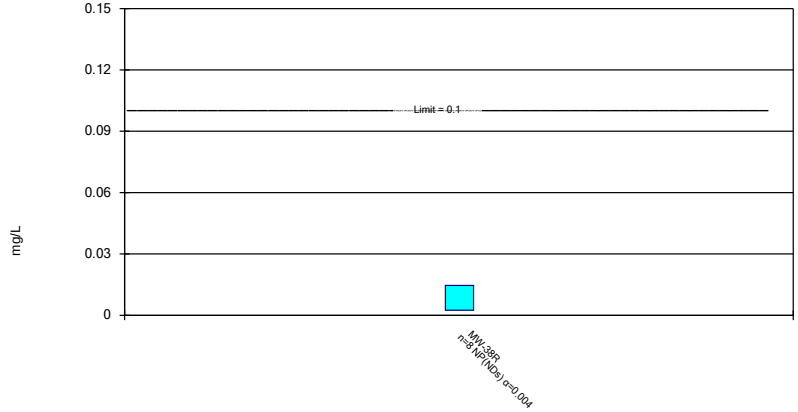


Constituent: Chlorobenzene Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Chromium Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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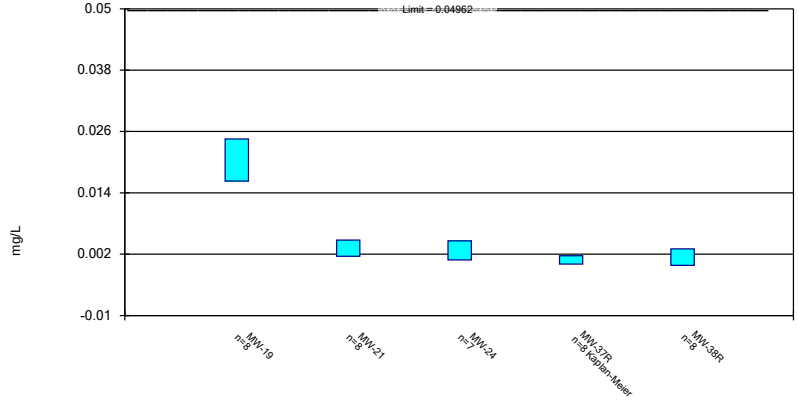
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cobalt Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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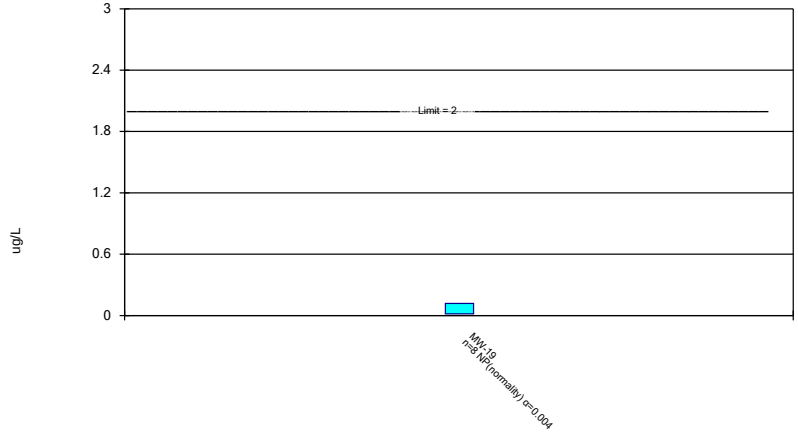
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: gamma-Chlordane Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval -
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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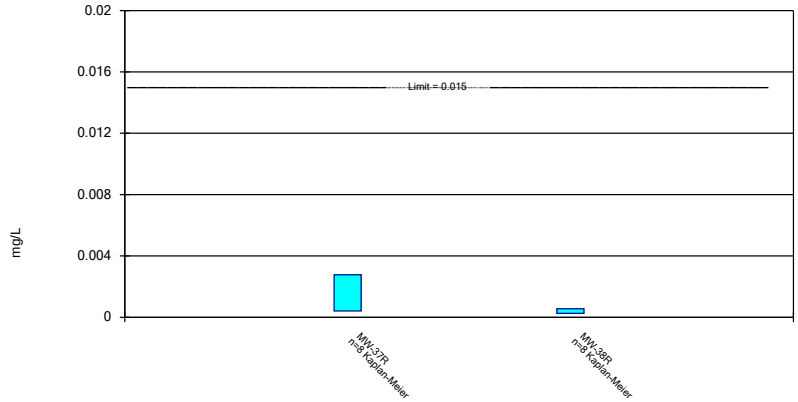
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Lead Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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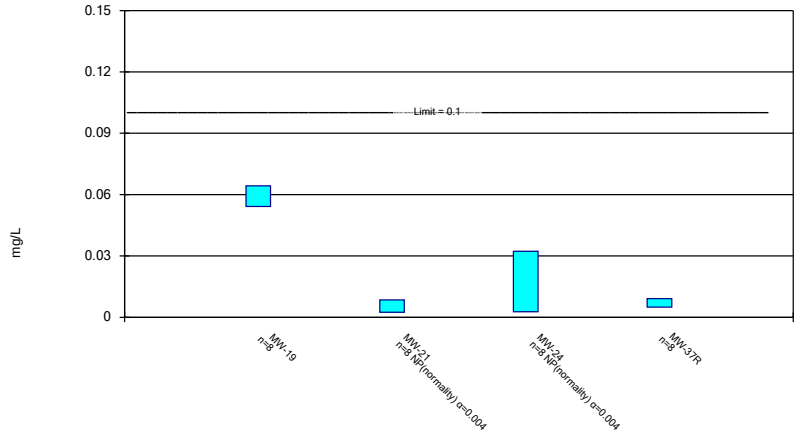
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Nickel Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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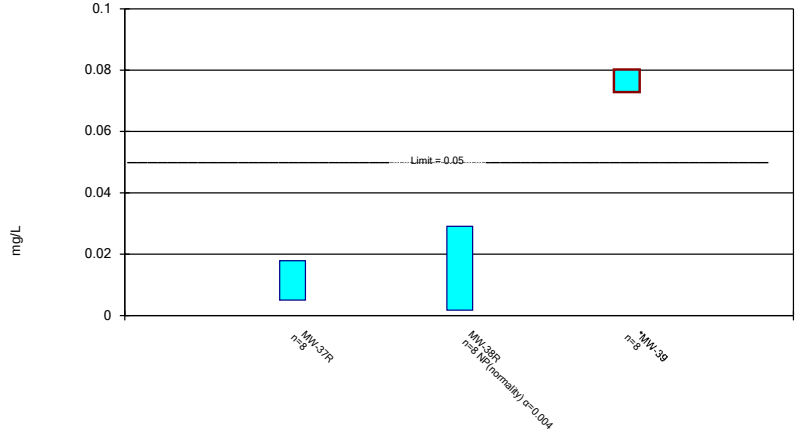
Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Selenium Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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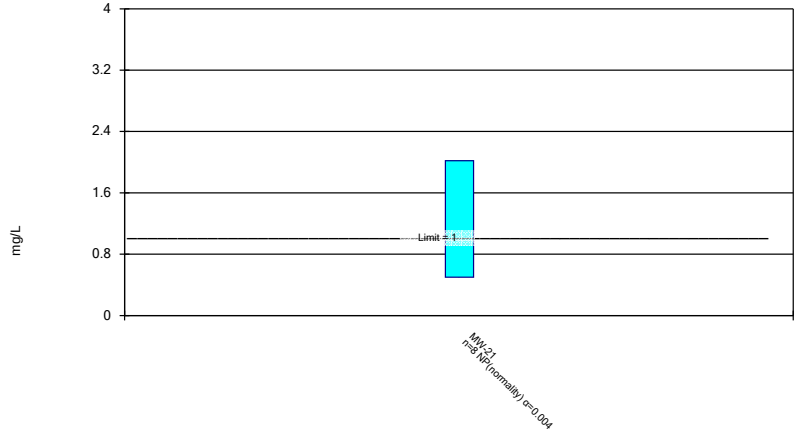
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Sulfide Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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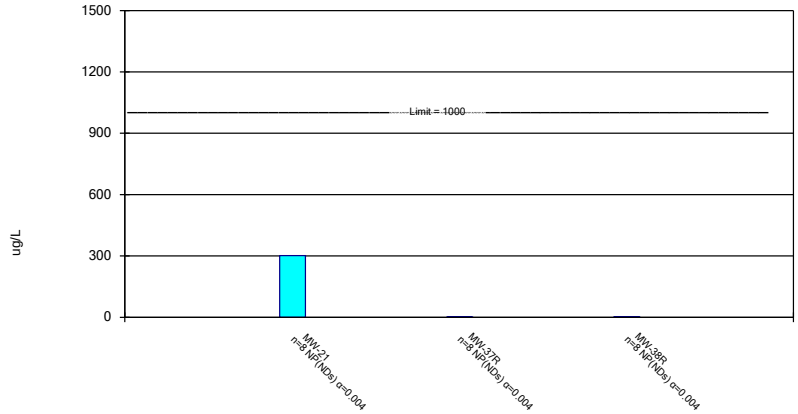
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Toluene Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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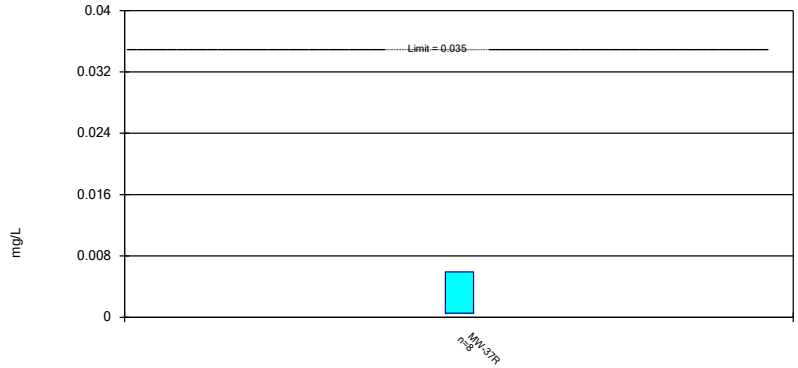
Parametric Confidence Interval

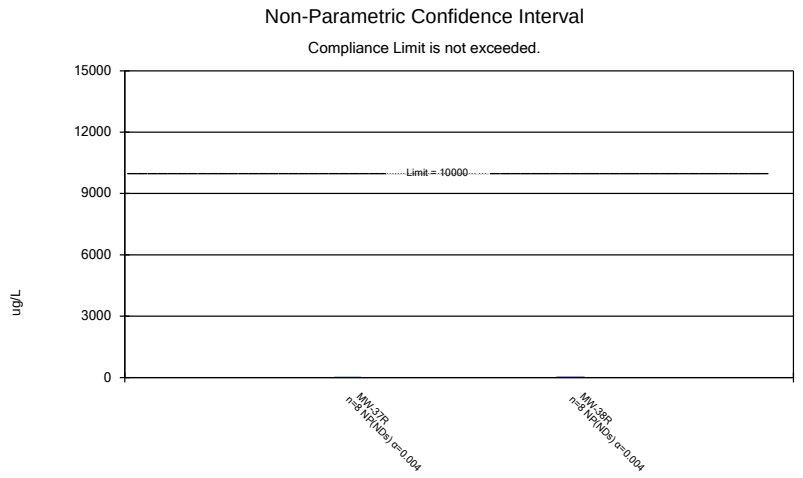
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Vanadium Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG



Constituent: Xylenes, total Analysis Run 5/12/2023 4:37 PM View: 2023SSN - Confidence Interval - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Confidence Interval Summary Table and Graphs – Dakota Sandstone

Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN Printed 5/12/2023, 5:27 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-23	0.001625	0.0005	0.006304	No	8	75	No	0.004	NP (NDs)
Antimony (mg/L)	MW-36	0.00183	0.0005	0.006304	No	8	87.5	No	0.004	NP (NDs)
Arsenic (mg/L)	MW-11	0.01042	0.0009278	0.01	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-11	0.6227	0.3689	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-23	0.1621	0.1372	2	No	8	0	No	0.01	Param.
Cadmium (mg/L)	MW-11	0.000259	0.00005	0.005	No	8	50	No	0.004	NP (normality)
Cadmium (mg/L)	MW-36	0.0004544	0.00004159	0.005	No	8	12.5	No	0.01	Param.
Cobalt (mg/L)	**MW-11**	**0.01341**	**0.00438**	**0.003981**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Cobalt (mg/L)	MW-36	0.002931	0.0005016	0.003981	No	8	12.5	No	0.01	Param.
Copper (mg/L)	MW-36	0.00878	0.0025	1.3	No	8	87.5	No	0.004	NP (NDs)
Lead (mg/L)	MW-11	0.000534	0.00025	0.015	No	8	87.5	No	0.004	NP (NDs)
Lead (mg/L)	MW-36	0.00361	0.000233	0.015	No	8	50	No	0.004	NP (normality)
Nickel (mg/L)	MW-11	0.01624	0.004589	0.1	No	8	0	No	0.01	Param.
Thallium (mg/L)	MW-11	0.00122	0.0005	0.002	No	8	87.5	No	0.004	NP (NDs)

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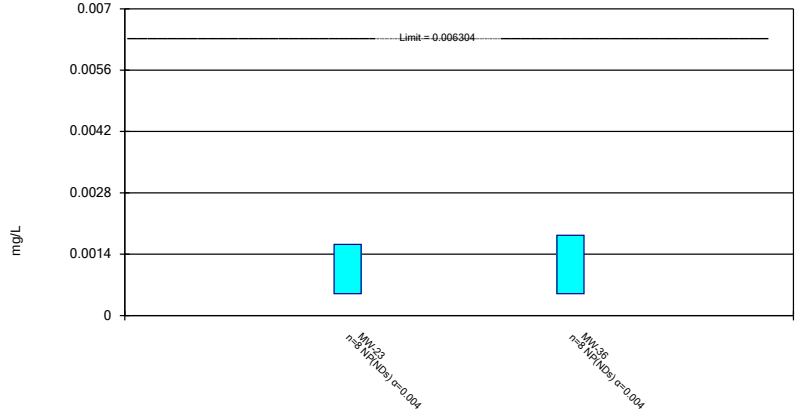
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Antimony Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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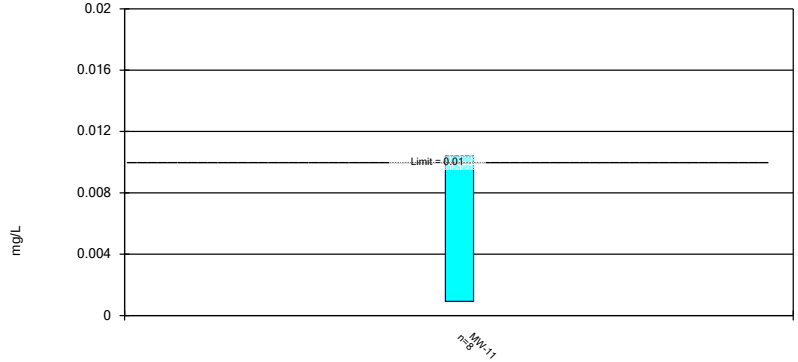
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Arsenic Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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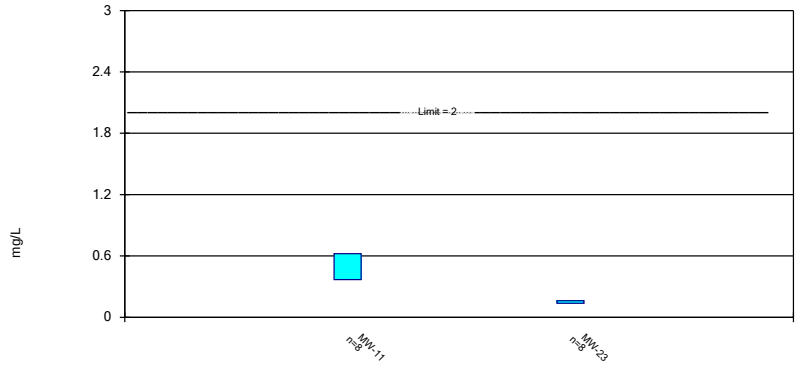
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Barium Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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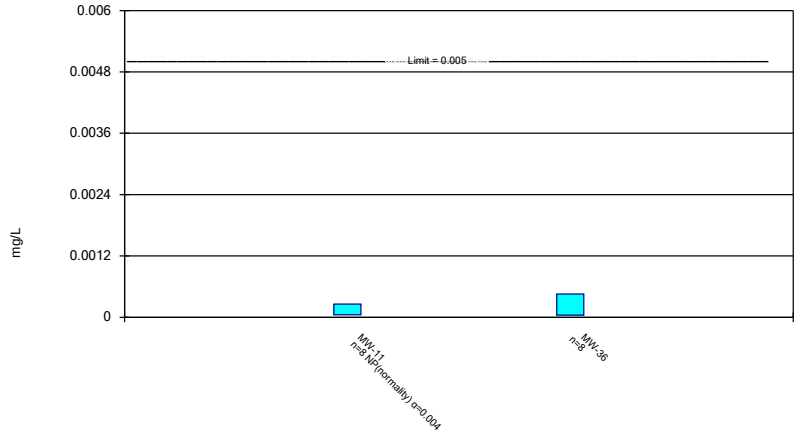
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cadmium Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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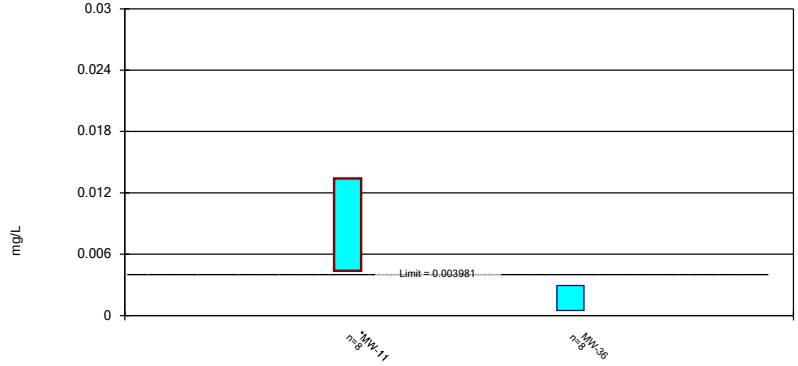
Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cobalt Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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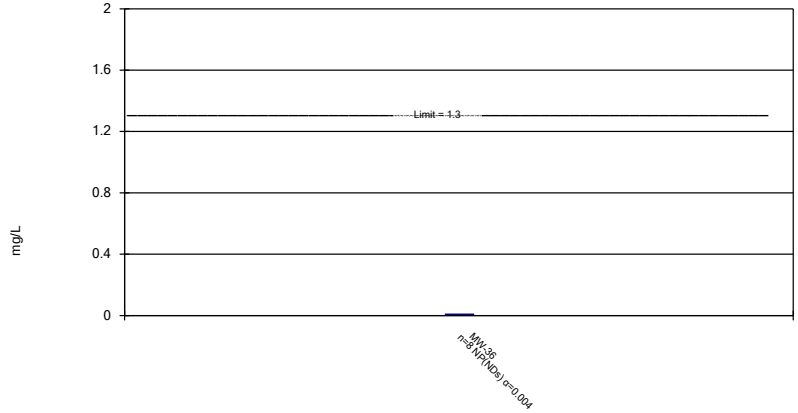
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Copper Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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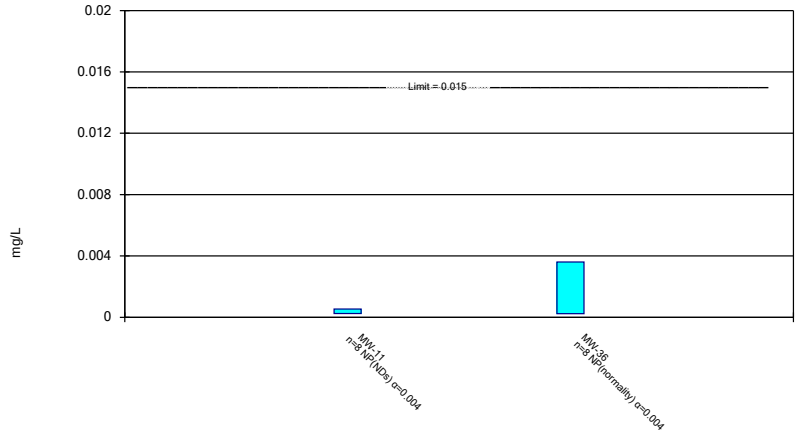
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Lead Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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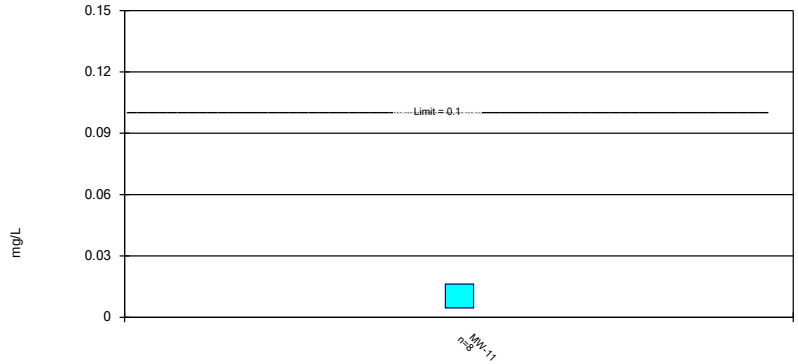
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Nickel Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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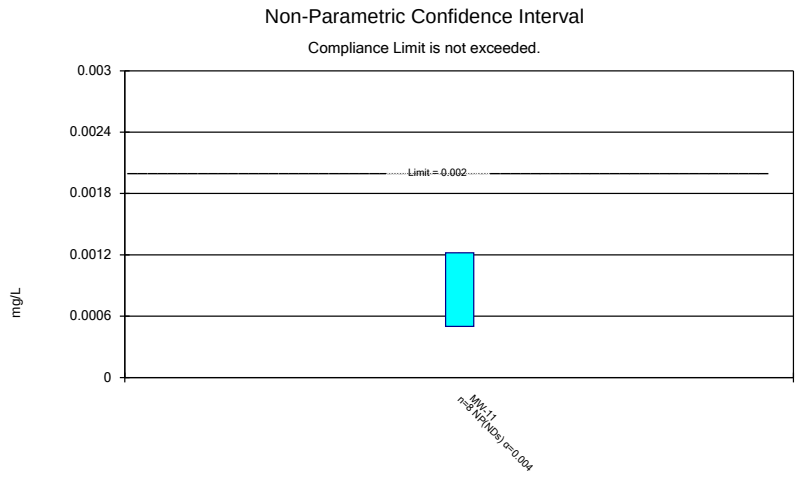


Constituent: Thallium Analysis Run 5/12/2023 5:25 PM View: 2023SSN - Confidence Interval - DS
Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

Theil-Sen Confidence Bands Summary Table and Graphs – Water Table

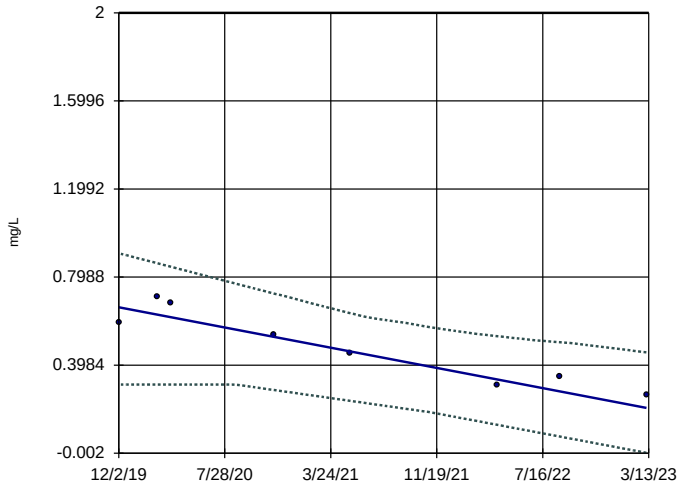
Trend Test/Theil Sen

Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM Printed 5/12/2023, 4:50 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Barium (mg/L)	**MW-38R**	**-0.1401**	**-22**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Nickel (mg/L)	**MW-38R**	**-0.002162**	**-22**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**

Sen's Slope and 99% Confidence Band

MW-38R



n = 8

Slope = -0.1401
units per year.

Mann-Kendall
statistic = -22
critical = -21

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Confidence band is
below GWPS mg/L (2).

Constituent: Barium Analysis Run 5/12/2023 4:49 PM View: 2023SSN - Theil Sen - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

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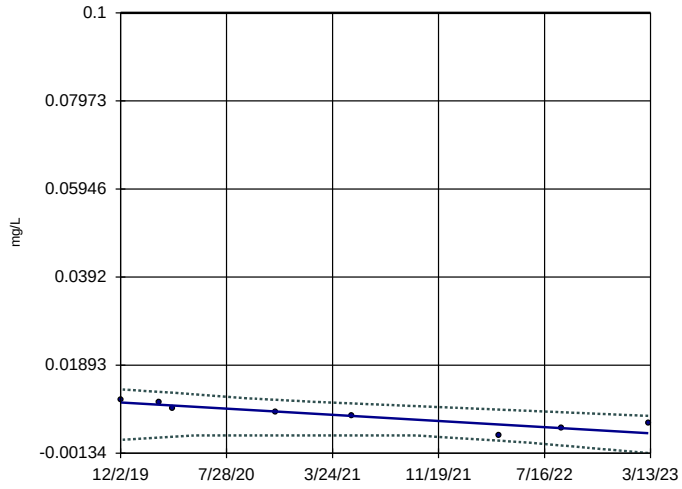
Sen's Slope and 99% Confidence Band

MW-38R



n = 8

Slope = -0.002162
units per year.

Mann-Kendall
statistic = -22
critical = -21

Decreasing trend
significant at 99%
confidence level
(α = 0.005 per
tail).

Confidence band is
below GWPS mg/L (0.1).

Constituent: Nickel Analysis Run 5/12/2023 4:49 PM View: 2023SSN - Theil Sen - WT
Cass County SLF Client: SCS Engineers Consulting Data: CASSC WT 2023SSN-AM

Theil-Sen Confidence Bands Summary Table and Graphs – Dakota Sandstone

Trend Test/Theil Sen

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN Printed 5/12/2023, 5:32 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Barium (mg/L)	**MW-36**	**-0.05661**	**-24**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Nickel (mg/L)	**MW-36**	**0.001608**	**22**	**21**	**Yes**	**8**	**12.5**	**0.01**	**NP**

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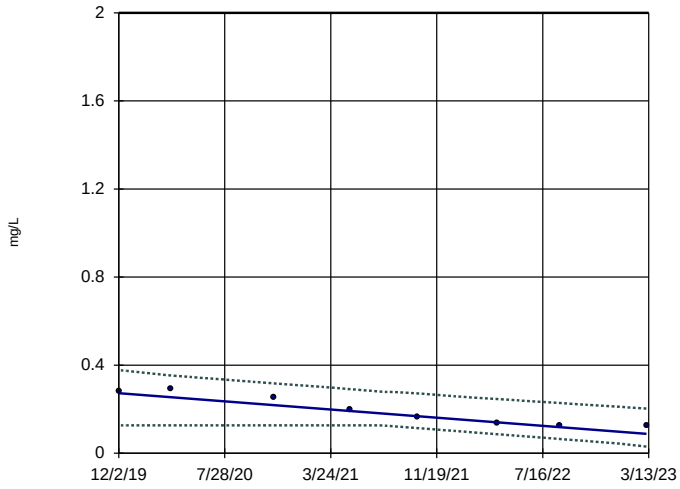
Sen's Slope and 99% Confidence Band

MW-36



n = 8

Slope = -0.05661 units per year.

Mann-Kendall statistic = -24 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Confidence band is below GWPS mg/L (2).

Constituent: Barium Analysis Run 5/12/2023 5:31 PM View: 2023SSN - Theil Sen - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

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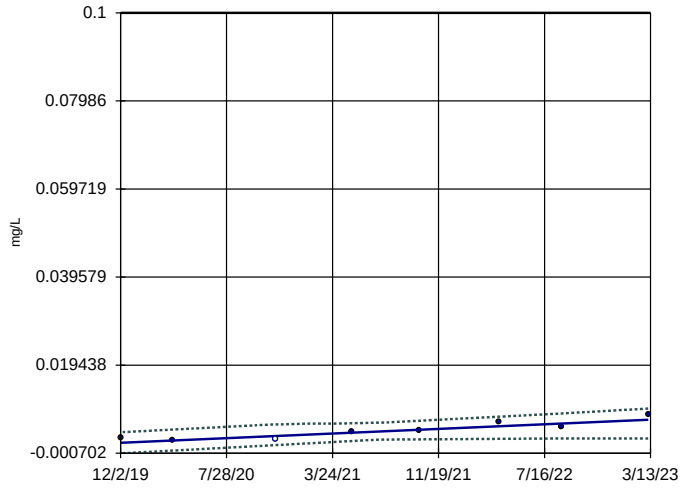
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-36



n = 8

Slope = 0.001608 units per year.

Mann-Kendall statistic = 22 critical = 21

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Confidence band is below GWPS mg/L (0.1).

Constituent: Nickel Analysis Run 5/12/2023 5:31 PM View: 2023SSN - Theil Sen - DS

Cass County SLF Client: SCS Engineers Consulting Data: CASSC DS 2023SSN

UD-0 Background Establishment

Outlier Analysis

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 5/12/2023, 5:53 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Normality Test
Antimony (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.001579	0.0008658	ShapiroWilk
Arsenic (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.00348	0.002349	ShapiroWilk
Barium (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.574	0.2737	ShapiroWilk
Cadmium (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.0001721	0.00009507	ShapiroWilk
Chromium (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.005288	0.003247	ShapiroWilk
Cobalt (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.009419	0.007703	ShapiroWilk
Copper (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.006164	0.005286	ShapiroWilk
Lead (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.0009396	0.000637	ShapiroWilk
Nickel (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.07274	0.03059	ShapiroWilk
Selenium (mg/L)	UD-0	No	n/a	n/a	NP (nrm)/OH	NaN	5	0.00226	0.0004574	ShapiroWilk
Thallium (mg/L)	**UD-0**	**Yes**	**0.001**	**10/14/2014**	**OH**	**NaN**	**5**	**0.0005172**	**0.000324**	**n/a**
Vanadium (mg/L)	**UD-0**	**Yes**	**0.025**	**10/14/2014**	**Dixon/OH**	**0.01**	**5**	**0.007094**	**0.01003**	**ShapiroWilk**

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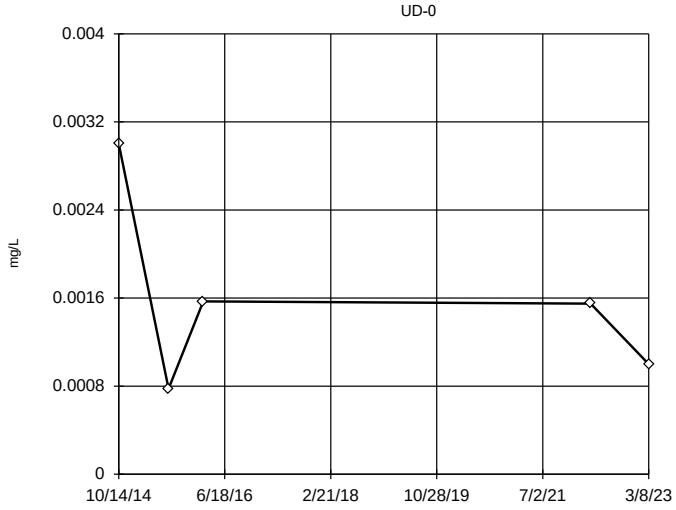
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.001579, std. dev. 0.0008658, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8698
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Antimony Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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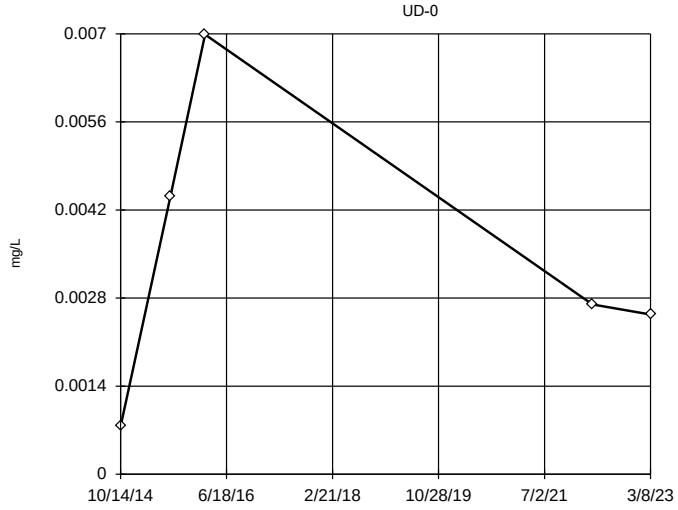
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.00348, std. dev. 0.002349, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.955
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Arsenic Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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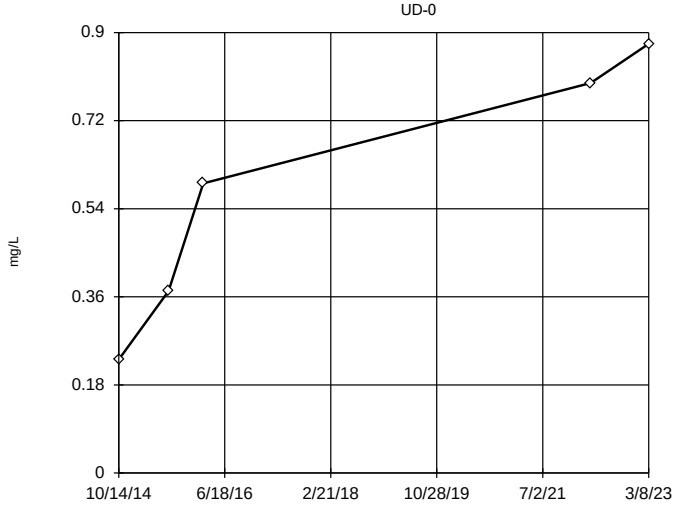
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.574, std. dev. 0.2737, critical Tn 1.672

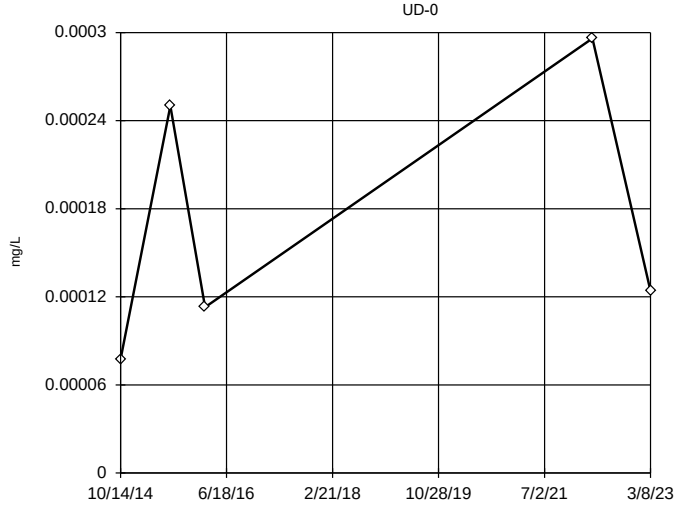
Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9418
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.0001721, std. dev. 0.00009507, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8783
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Cadmium Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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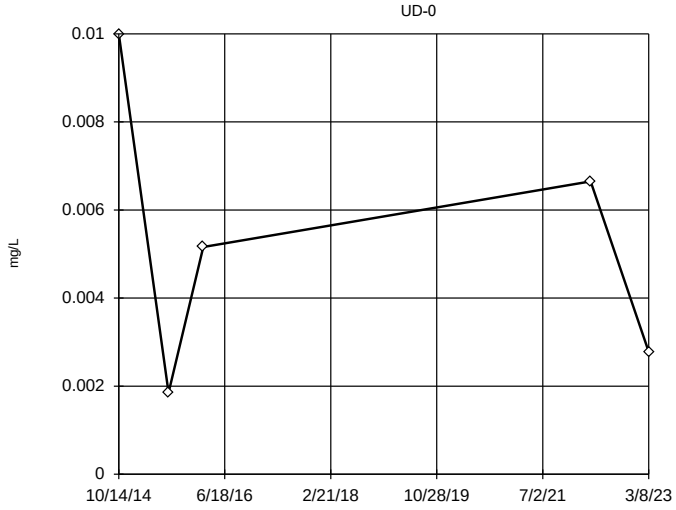
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.005288, std. dev. 0.003247, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.956
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Chromium Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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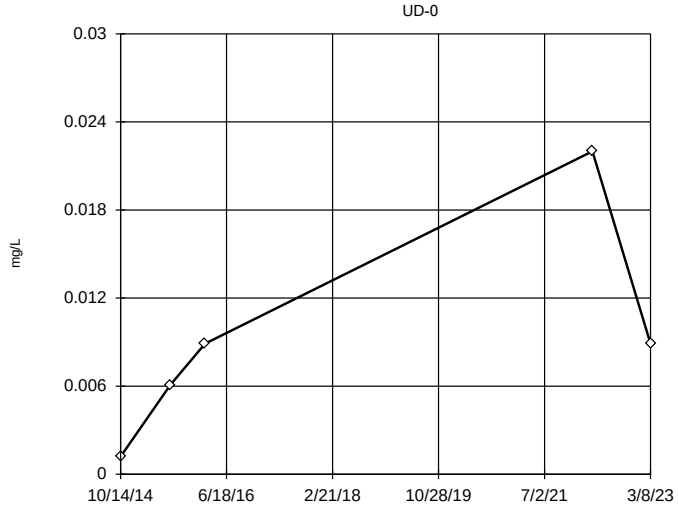
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.009419, std. dev. 0.007703, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8855
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Cobalt Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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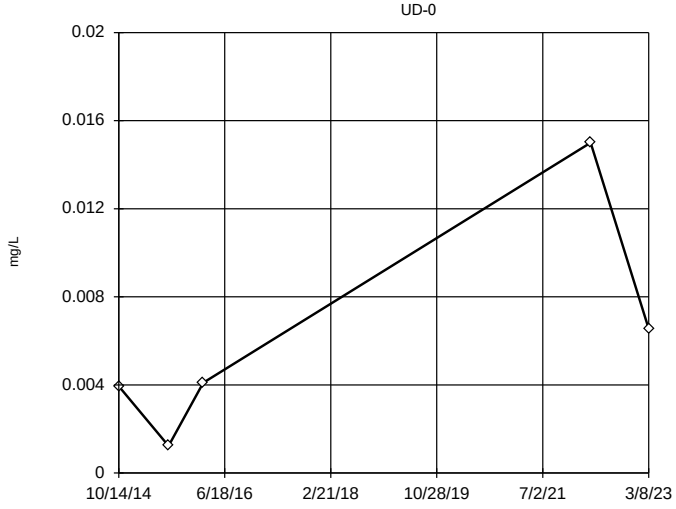
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.006164, std. dev. 0.005286, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.856
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Copper Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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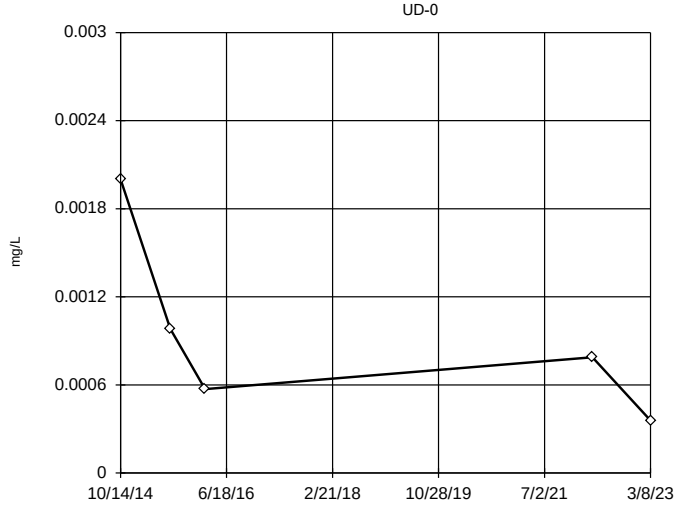
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.0009396, std. dev. 0.000637, critical Tn 1.672

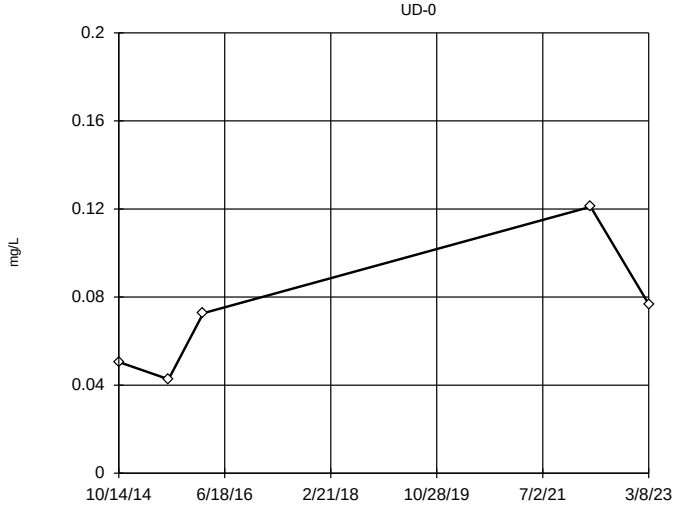
Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8727
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Lead Analysis Run 5/12/2023 5:50 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)



n = 5

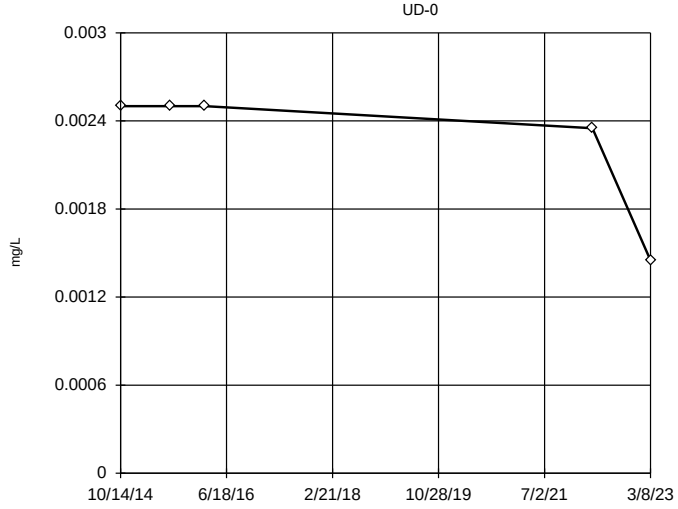
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.07274, std. dev. 0.03059, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9108
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Nickel Analysis Run 5/12/2023 5:51 PM View: 2023SSN - UD-0 BG
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



n = 5

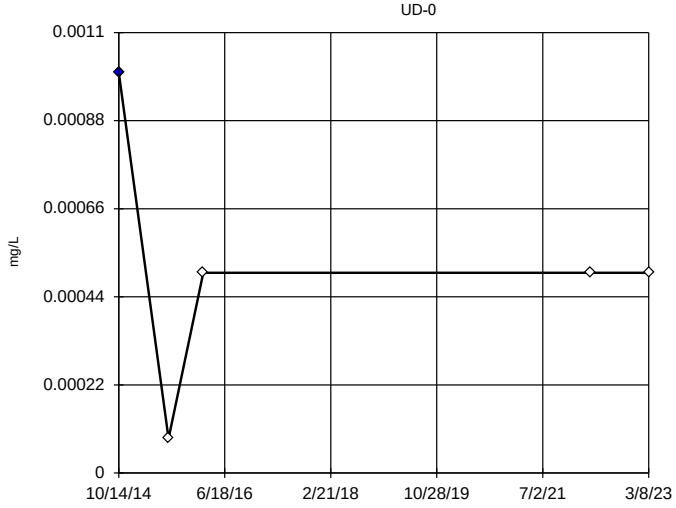
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.0043, low cutoff = 0.0001, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 5/12/2023 5:51 PM View: 2023SSN - UD-0 BG
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm



n = 5

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Thallium Analysis Run 5/12/2023 5:51 PM View: 2023SSN - UD-0 BG
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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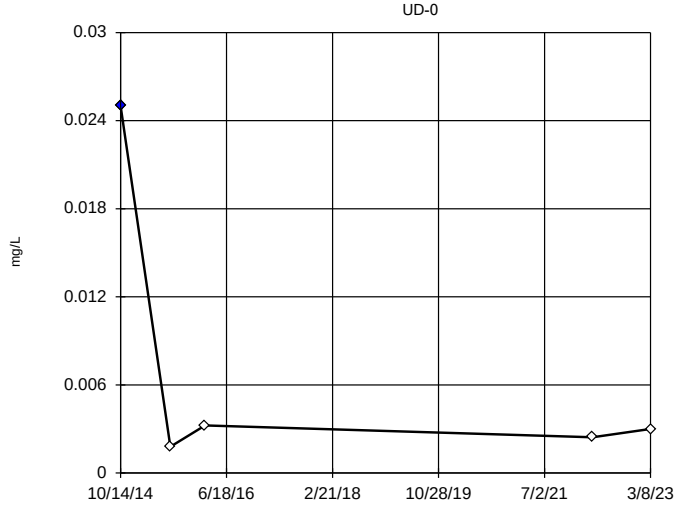
Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm



n = 5

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.007094.
Std. Dev. = 0.01003.
<0.05: c = 0.9375
tabl = 0.78.
Alpha = 0.01.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.951
Critical = 0.687
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Vanadium Analysis Run 5/12/2023 5:51 PM View: 2023SSN - UD-0 BG
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Trend Test

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 5/12/2023, 5:55 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Antimony (mg/L)	UD-0	-0.0001372	-4	-12	No	5	40	0.01	NP
Arsenic (mg/L)	UD-0	0.00001895	0	12	No	5	0	0.01	NP
Barium (mg/L)	UD-0	0.07614	10	12	No	5	0	0.01	NP
Cadmium (mg/L)	UD-0	0.000006197	4	12	No	5	20	0.01	NP
Chromium (mg/L)	UD-0	-0.0003923	-2	-12	No	5	20	0.01	NP
Cobalt (mg/L)	UD-0	0.002255	7	12	No	5	20	0.01	NP
Copper (mg/L)	UD-0	0.0005228	6	12	No	5	0	0.01	NP
Lead (mg/L)	UD-0	-0.0001787	-8	-12	No	5	20	0.01	NP
Nickel (mg/L)	UD-0	0.006171	6	12	No	5	0	0.01	NP
Selenium (mg/L)	UD-0	-0.00002342	-7	-12	No	5	60	0.01	NP
Thallium (mg/L)	UD-0	0	-1	-12	No	5	80	0.01	NP
Vanadium (mg/L)	UD-0	-0.00008211	-2	-12	No	5	20	0.01	NP

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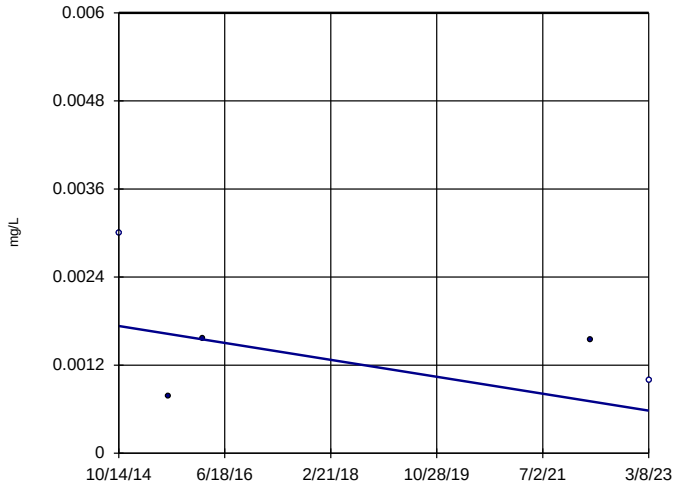
Hollow symbols indicate censored values.

Sen's Slope Estimator

UD-0



n = 5

Slope = -0.0001372 units per year.

Mann-Kendall statistic = -4 critical = -12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 0.006.

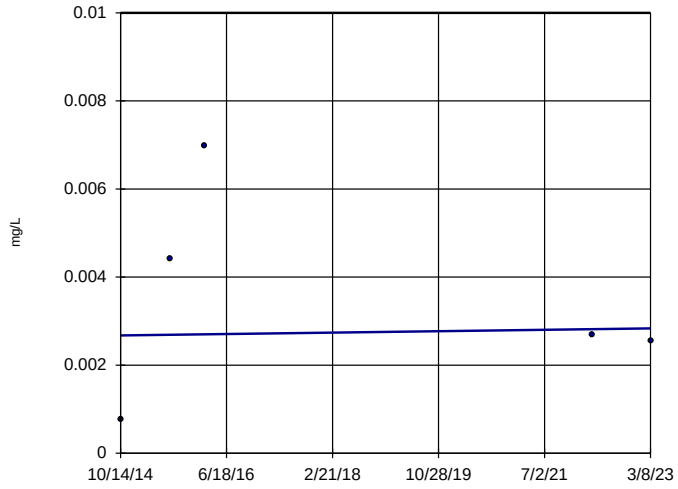
Constituent: Antimony Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

UD-0



n = 5

Slope = 0.00001895 units per year.

Mann-Kendall statistic = 0 critical = 12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 0.01.

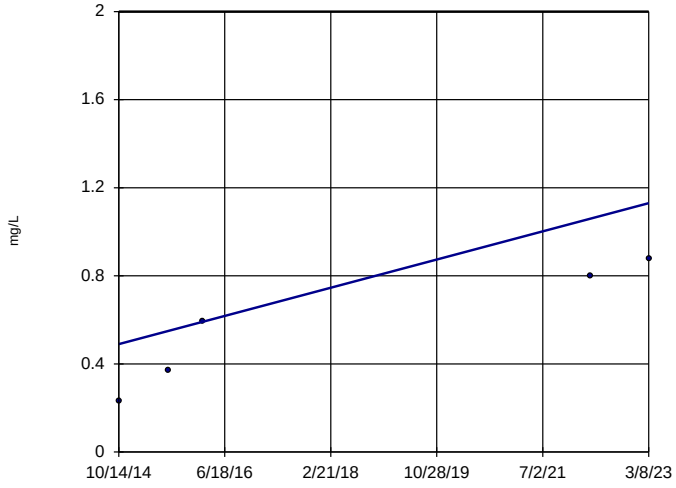
Constituent: Arsenic Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

UD-0



n = 5

Slope = 0.07614 units per year.

Mann-Kendall statistic = 10 critical = 12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 2.

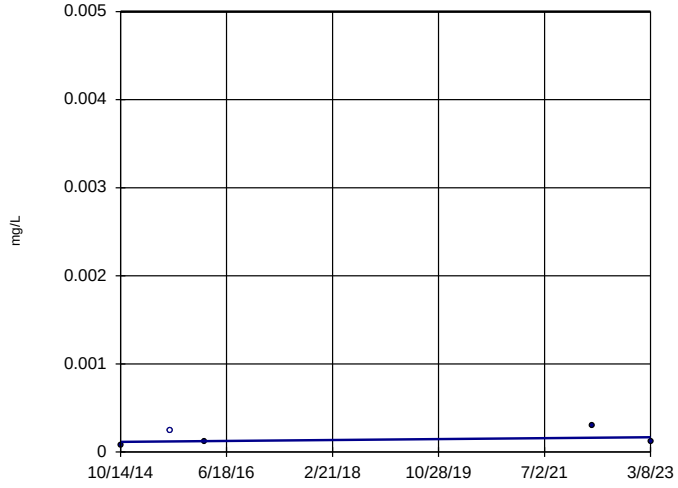
Constituent: Barium Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

UD-0



n = 5

Slope = 0.000006197 units per year.

Mann-Kendall statistic = 4 critical = 12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 0.005.

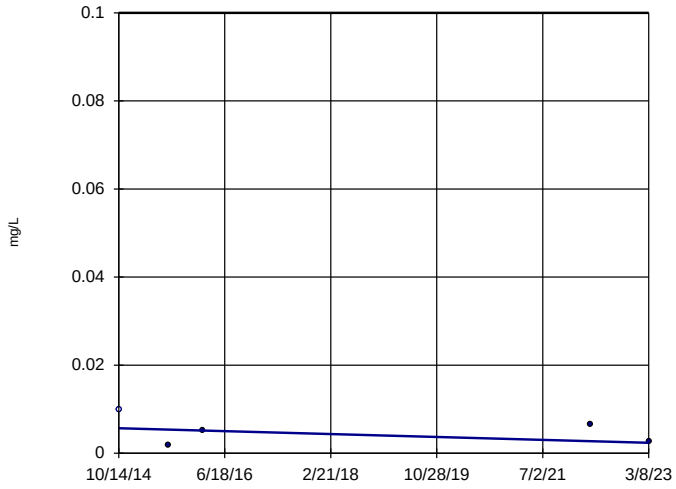
Constituent: Cadmium Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

UD-0



n = 5

Slope = -0.0003923 units per year.

Mann-Kendall statistic = -2 critical = -12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 0.1.

Constituent: Chromium Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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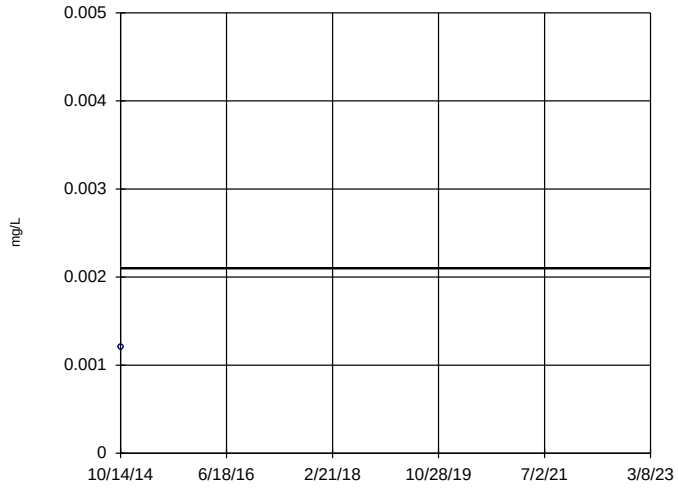
Hollow symbols indicate censored values.

Sen's Slope Estimator

UD-0



n = 5

Slope = 0.002255 units per year.

Mann-Kendall statistic = 7 critical = 12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 0.0021.

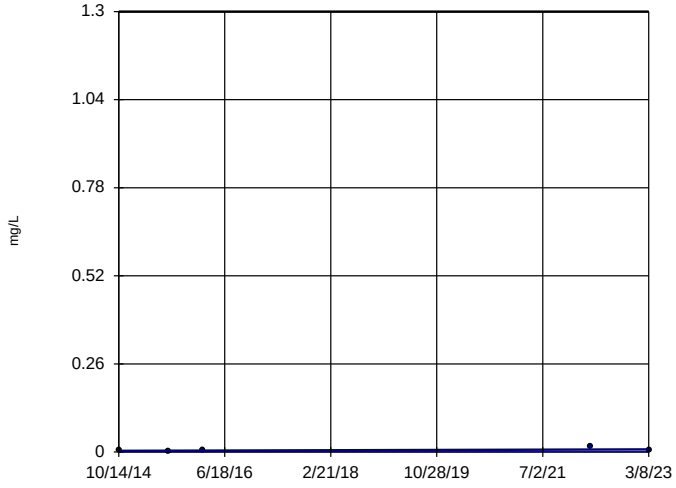
Constituent: Cobalt Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

UD-0



n = 5

Slope = 0.0005228 units per year.

Mann-Kendall statistic = 6 critical = 12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 1.3.

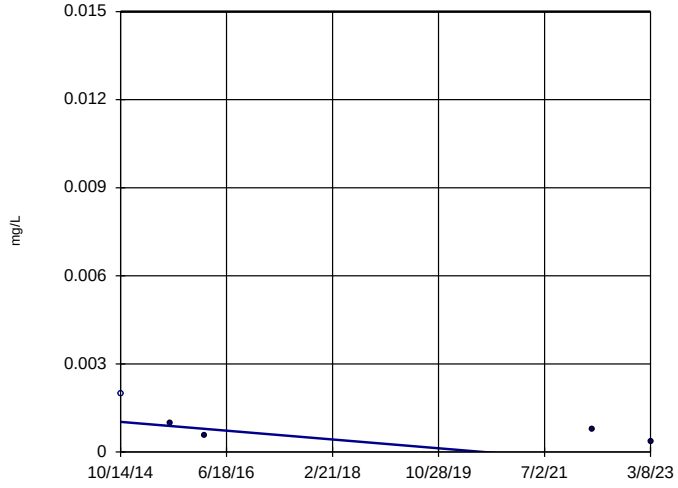
Constituent: Copper Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

UD-0



n = 5

Slope = -0.0001787 units per year.

Mann-Kendall statistic = -8 critical = -12

Trend not significant at 99% confidence level (α = 0.005 per tail).

GWPS mg/L = 0.015.

Constituent: Lead Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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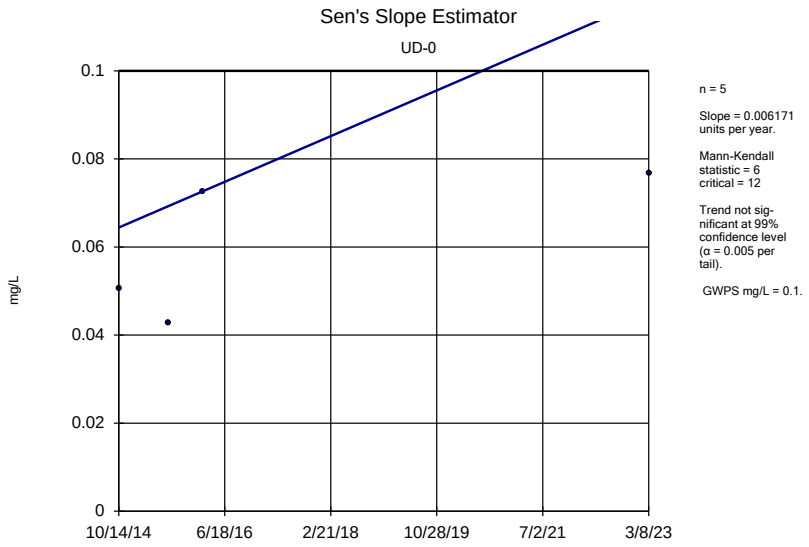
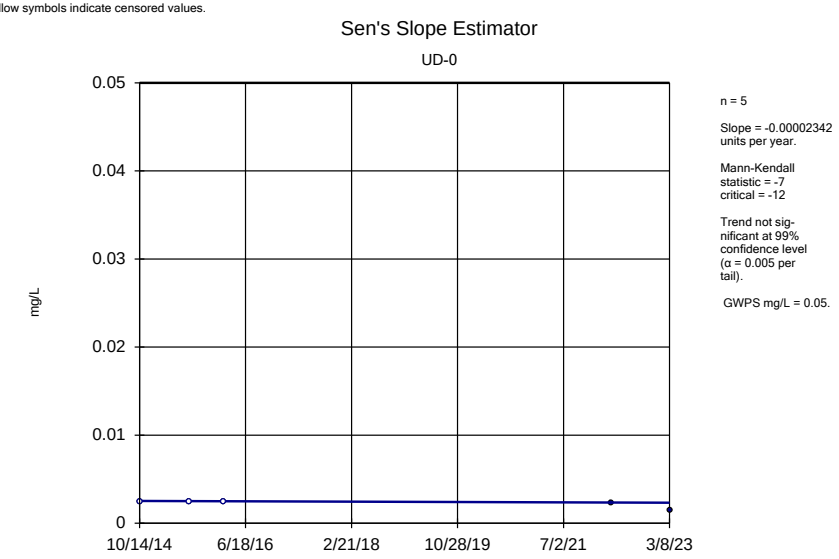


Constituent: Nickel Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

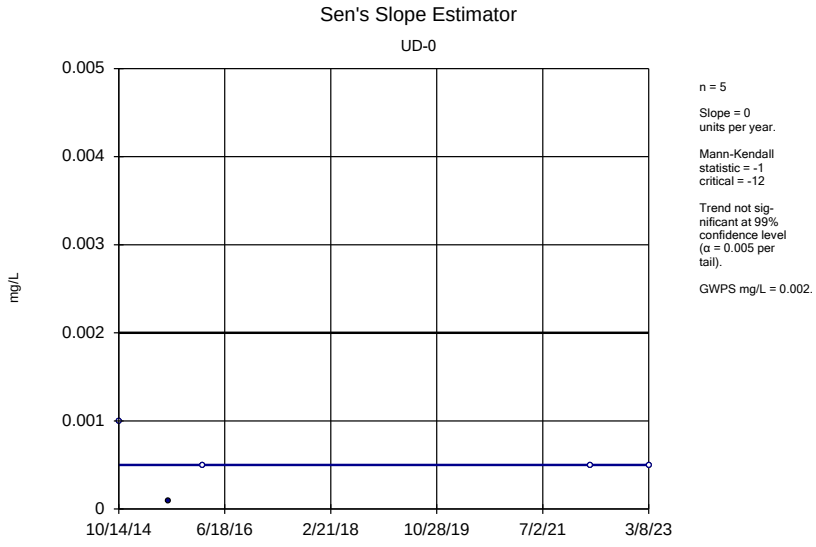
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Selenium Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

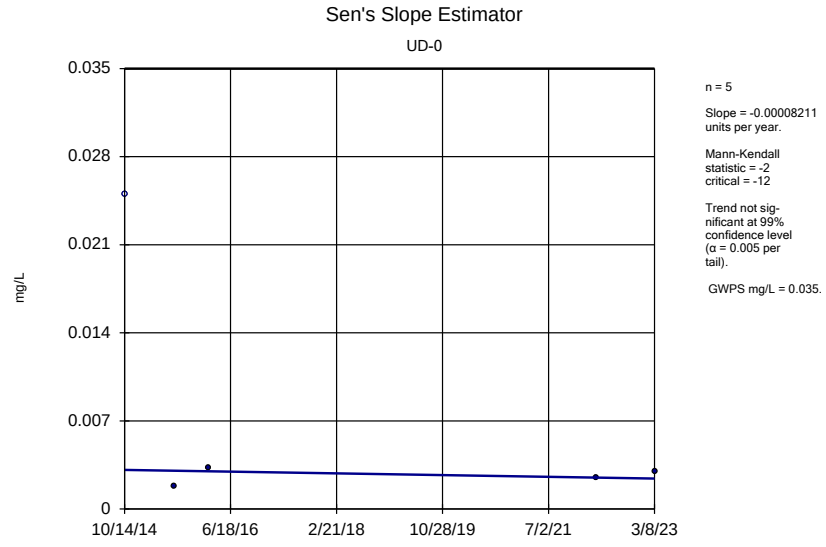
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Thallium Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Vanadium Analysis Run 5/12/2023 5:54 PM View: 2023SSN - UD-0 BG

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Attachment B

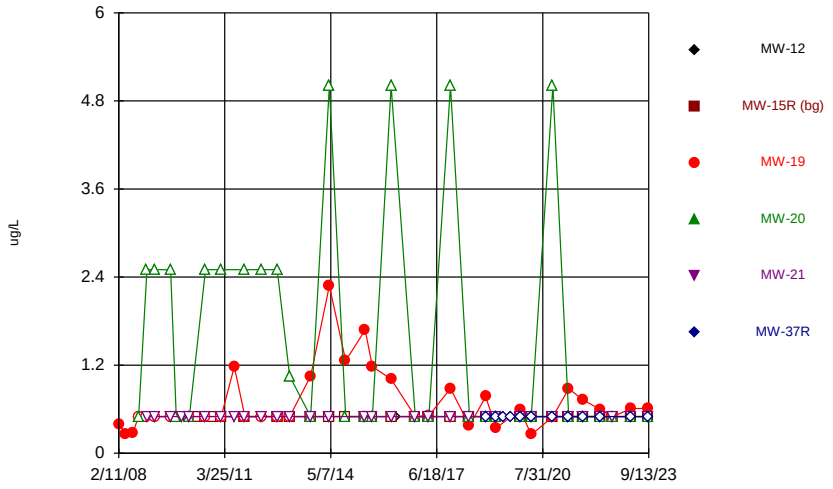
2nd 2023 Statistical Evaluation Output

Time Series Plots –

Water Table

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

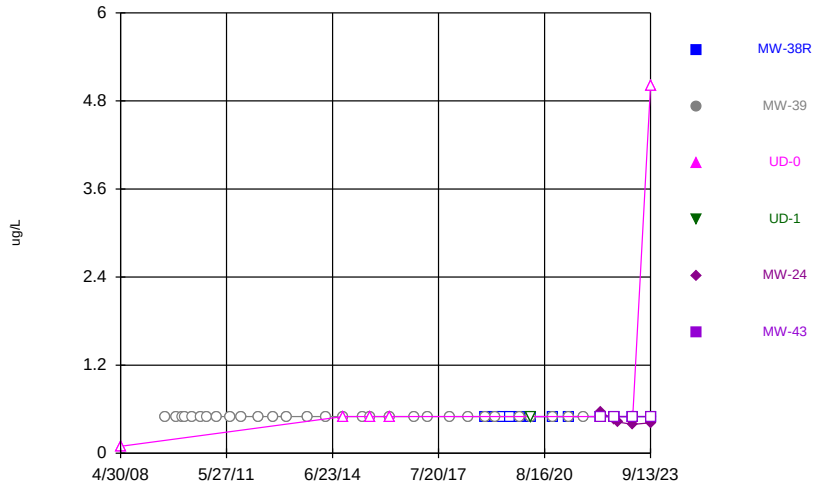
Time Series



Constituent: 1,1-Dichloroethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

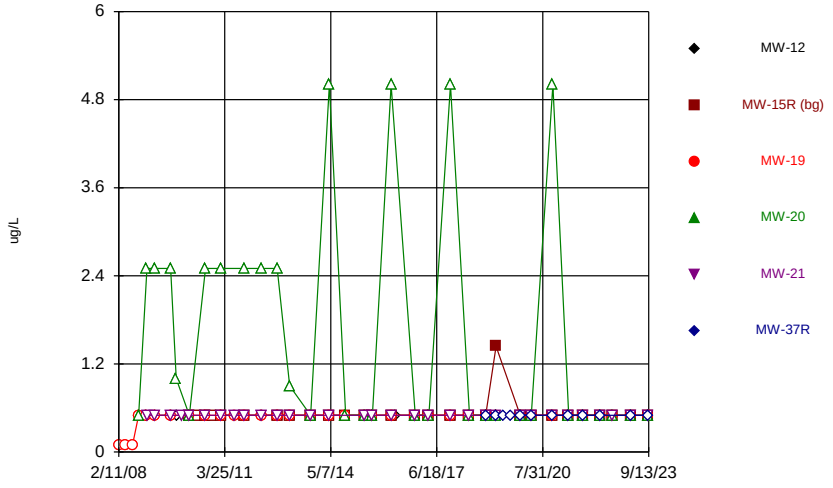
Time Series



Constituent: 1,1-Dichloroethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

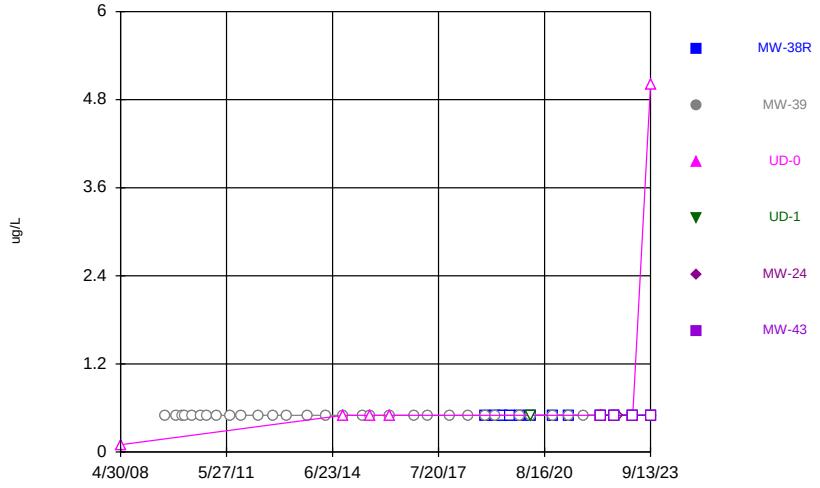
Time Series



Constituent: 1,2-Dichloroethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

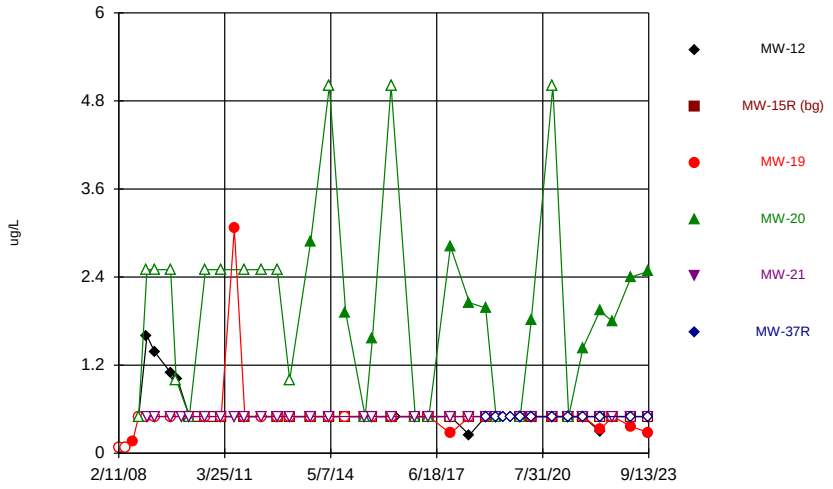
Time Series



Constituent: 1,2-Dichloroethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

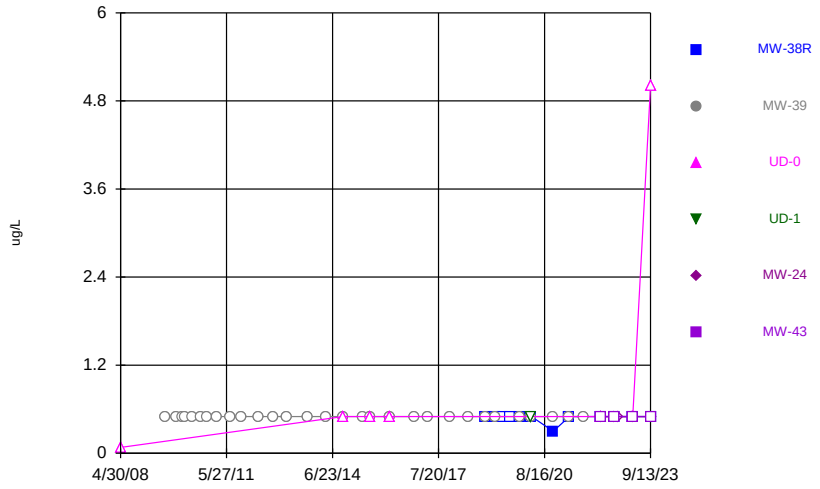
Time Series



Constituent: 1,4-Dichlorobenzene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

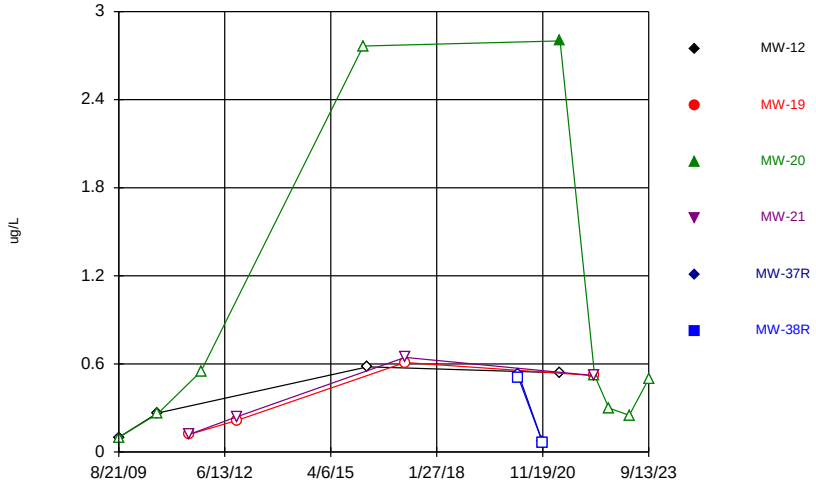
Time Series



Constituent: 1,4-Dichlorobenzene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

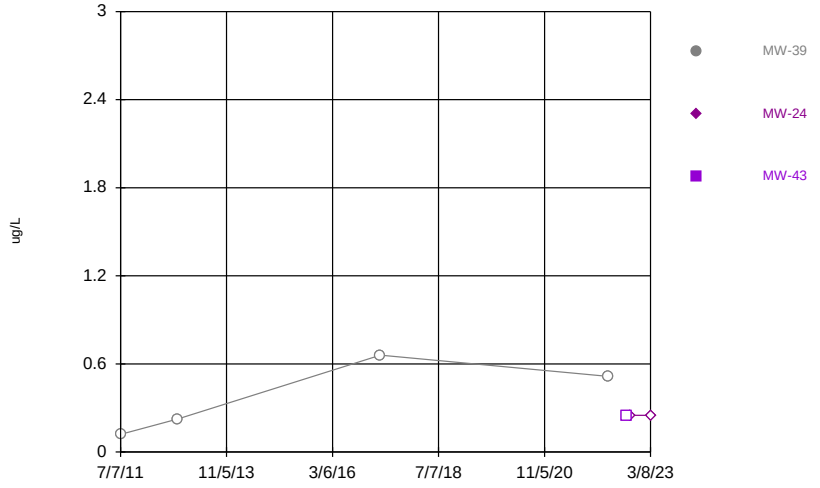
Time Series



Constituent: 2,4,5-T [2C] Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

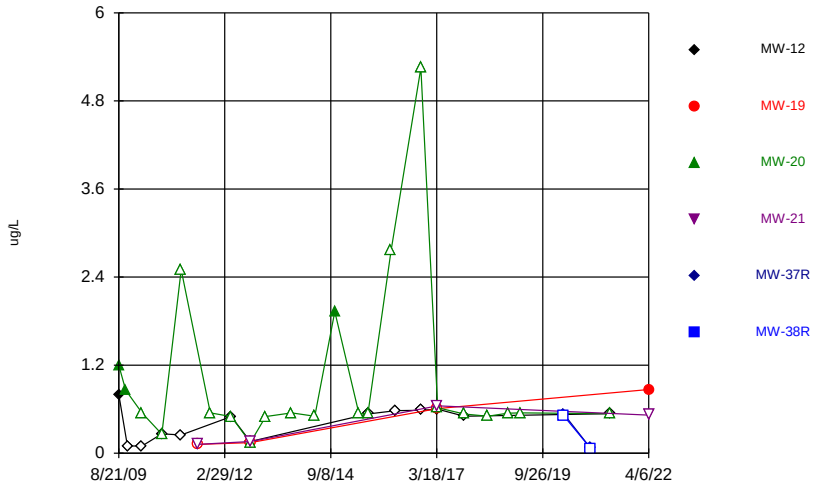
Time Series



Constituent: 2,4,5-T [2C] Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: 2,4,5-TP [Silvex] [2C] Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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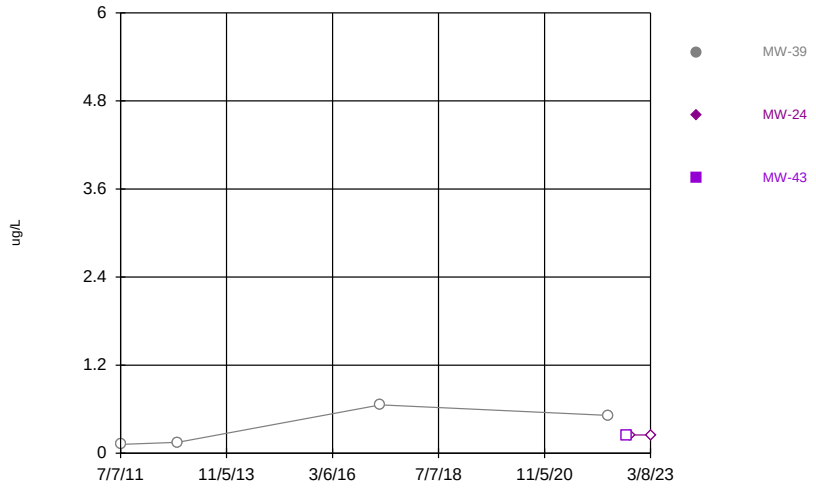
Hollow symbols indicate censored values.

Time Series



Constituent: 2,4,5-TP [Silvex] [2C] Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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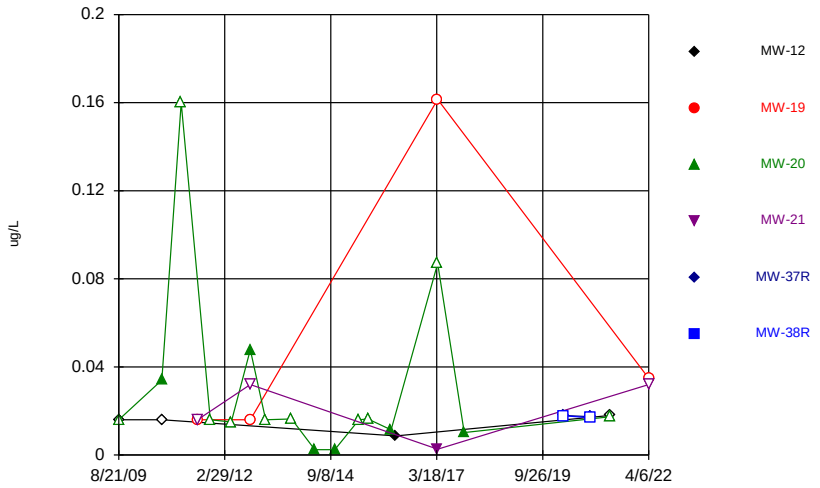
Hollow symbols indicate censored values.

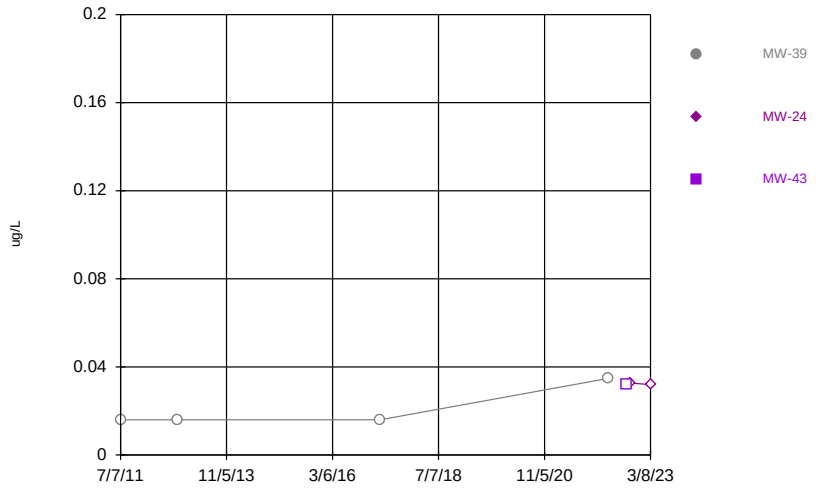
Time Series



Constituent: 4,4`-DDD Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

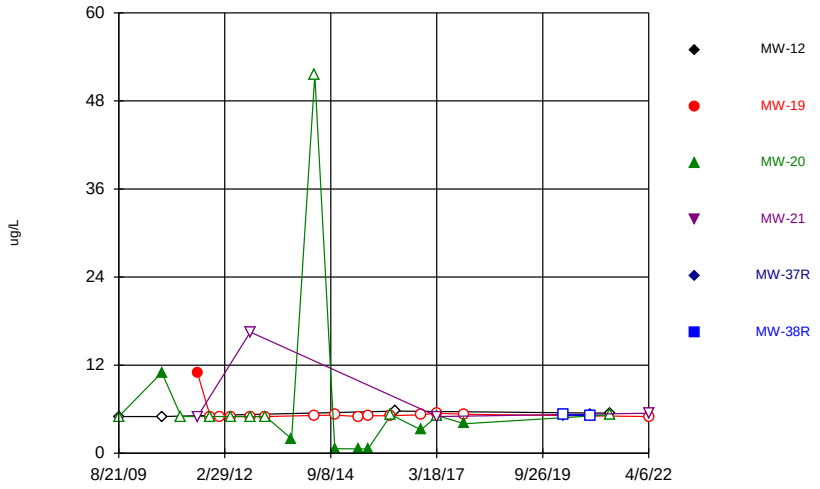
Time Series



Constituent: 4,4`-DDD Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

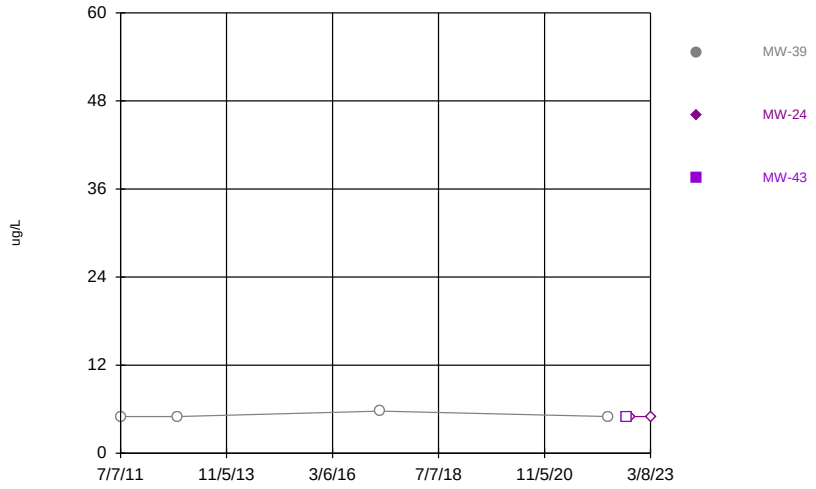
Time Series



Constituent: 4-Chloro-3-methylphenol Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

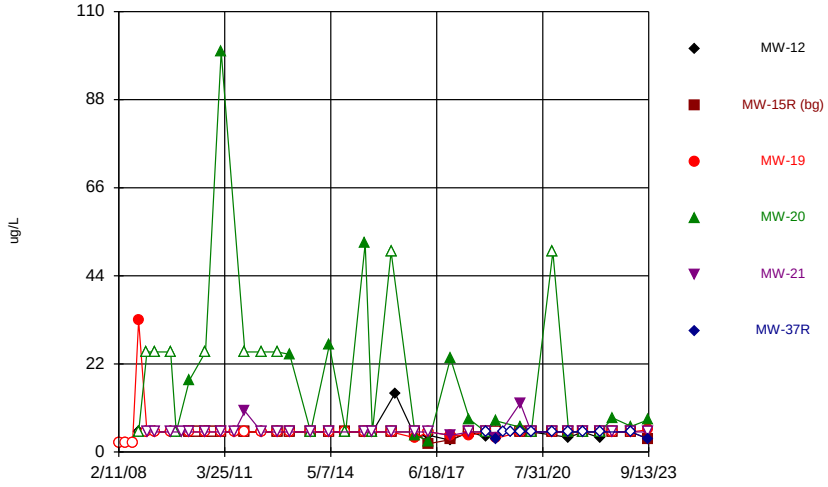
Time Series



Constituent: 4-Chloro-3-methylphenol Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

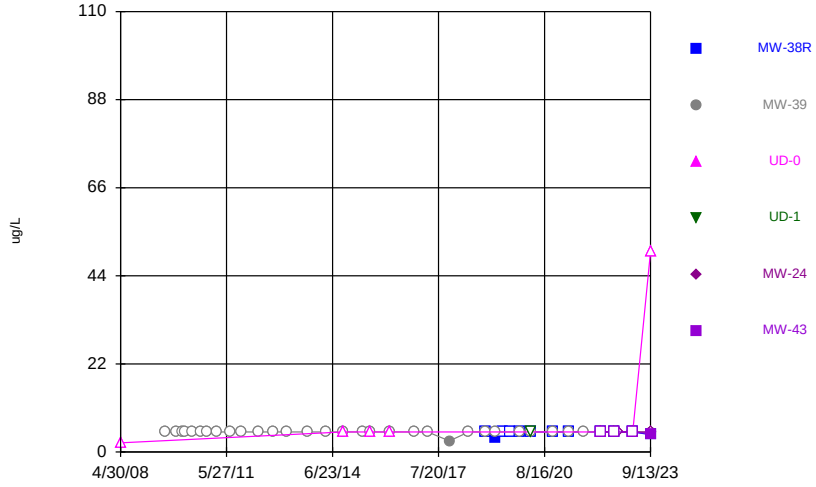
Time Series



Constituent: Acetone Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

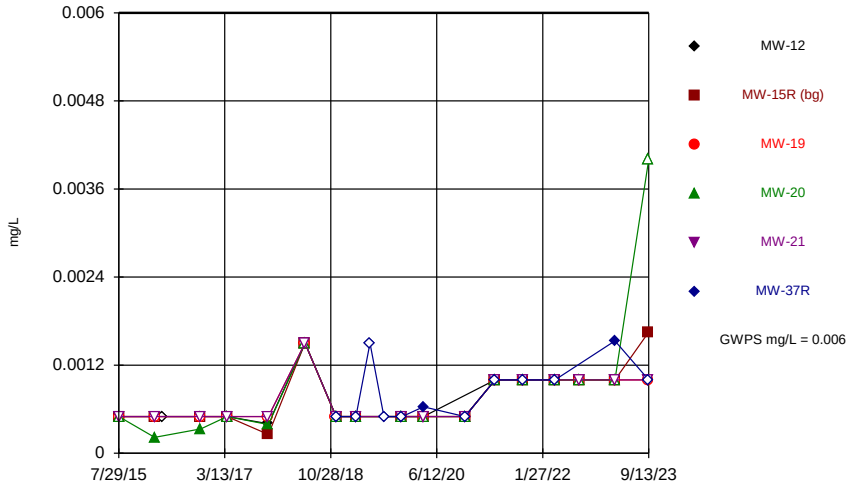
Time Series



Constituent: Acetone Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

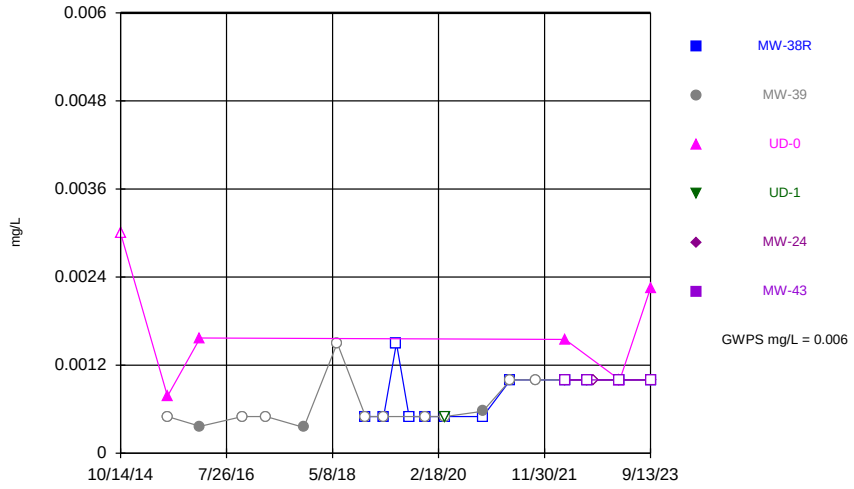
Time Series



Constituent: Antimony Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

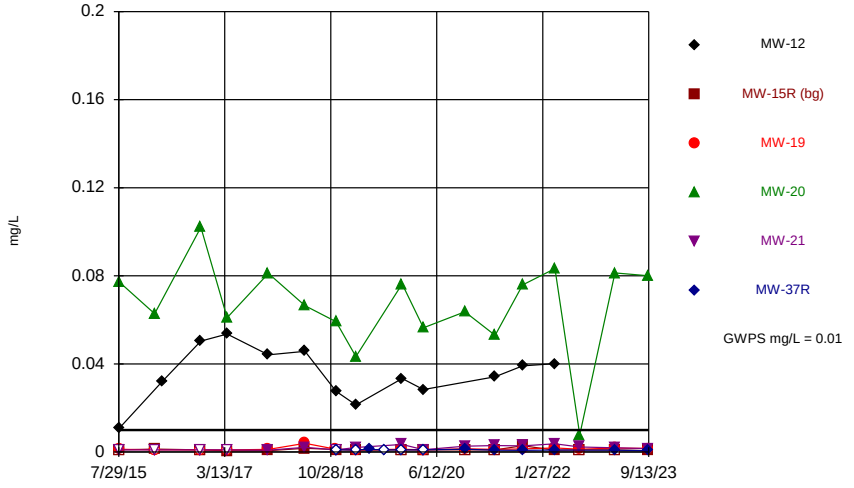
Time Series



Constituent: Antimony Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

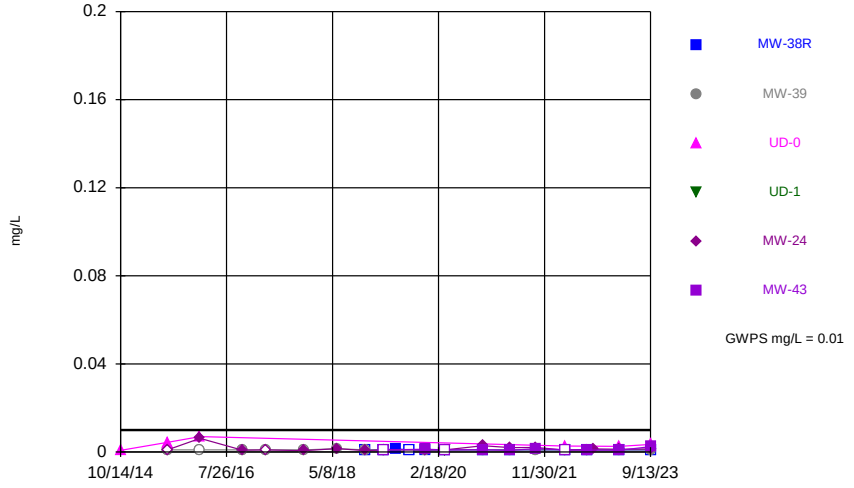
Time Series



Constituent: Arsenic Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

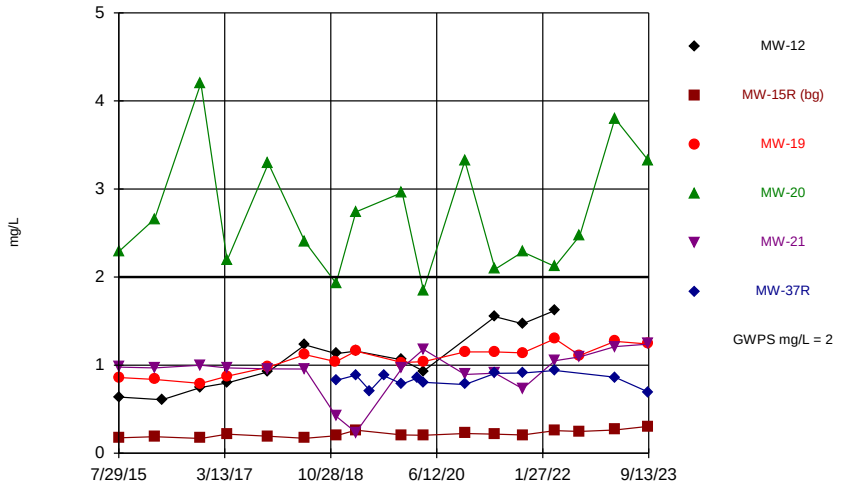
Time Series



Constituent: Arsenic Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

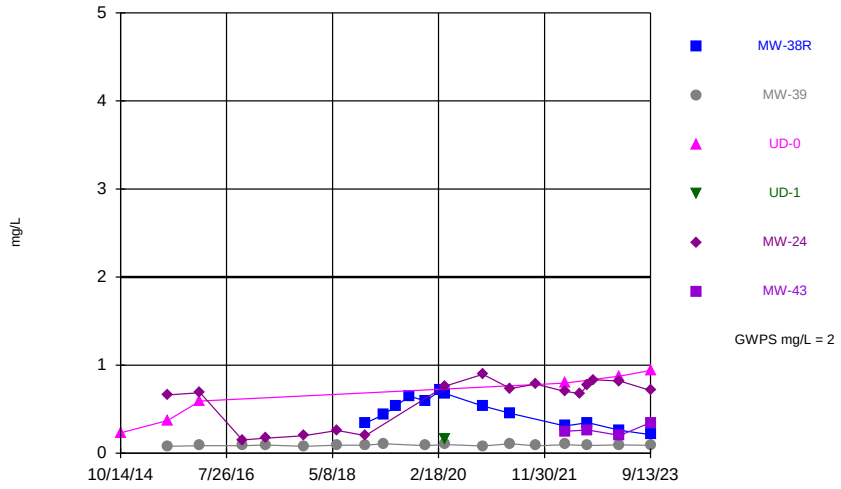
Time Series



Constituent: Barium Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

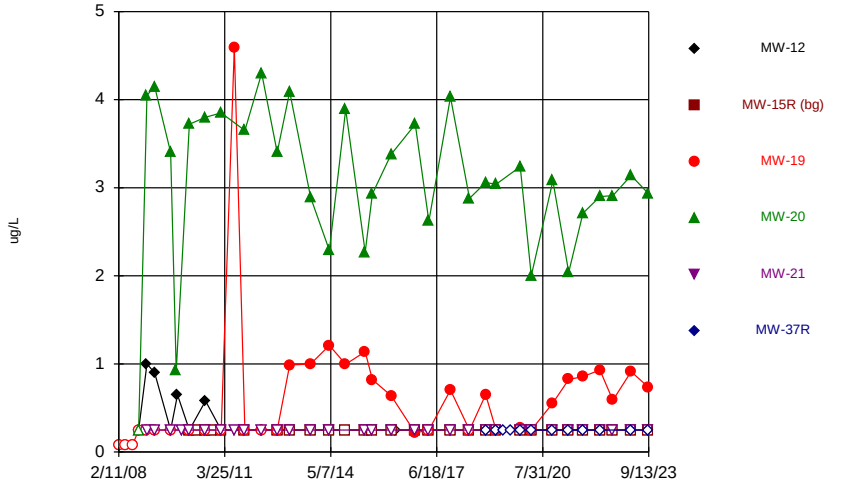
Time Series



Constituent: Barium Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

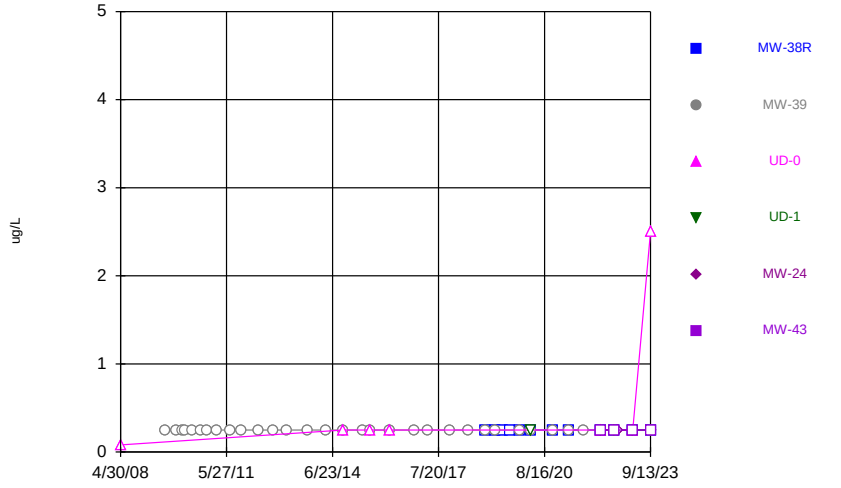
Time Series



Constituent: Benzene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

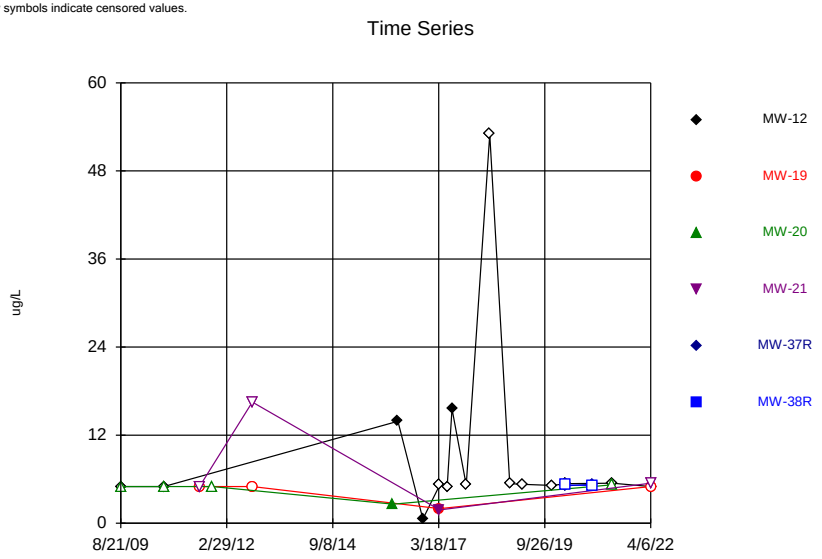
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



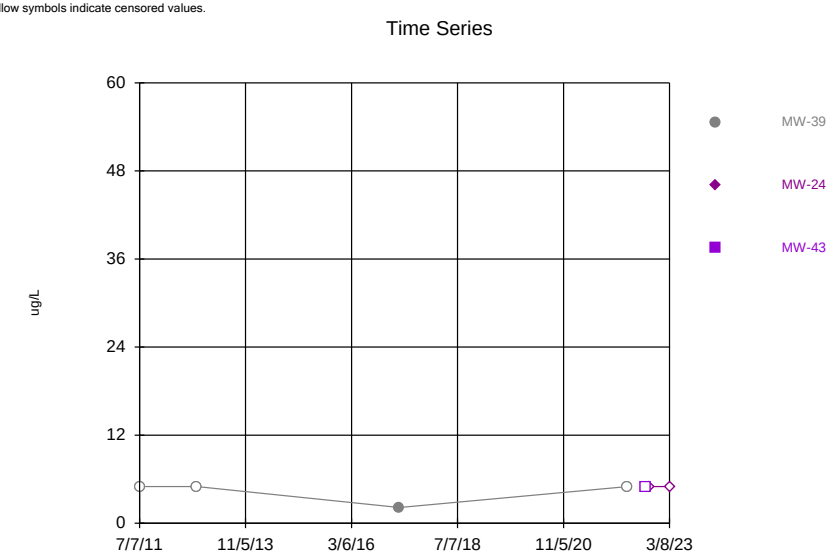
Constituent: Benzene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



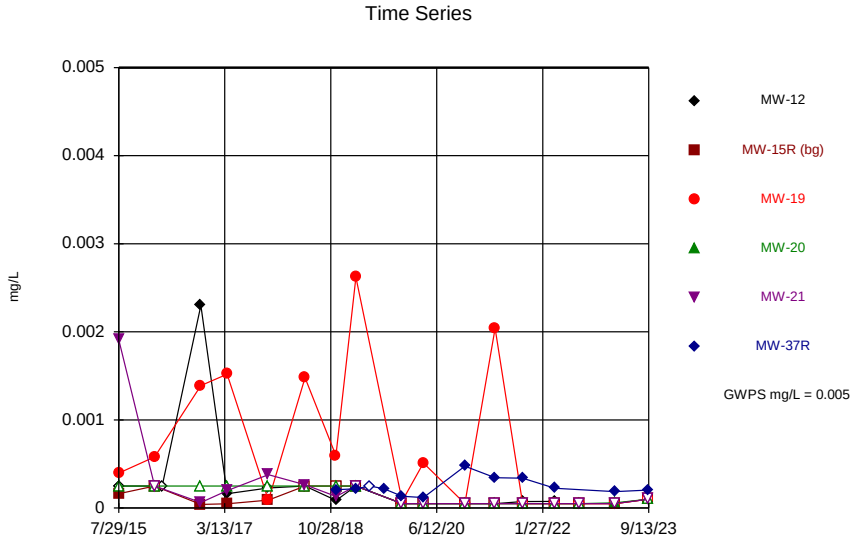
Constituent: Bis[2-ethylhexyl]phthalate Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



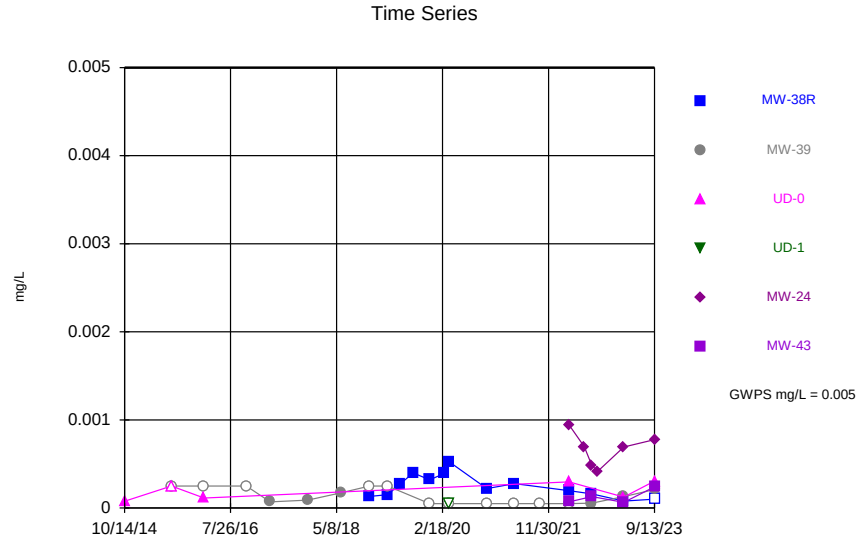
Constituent: Bis[2-ethylhexyl]phthalate Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Cadmium Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

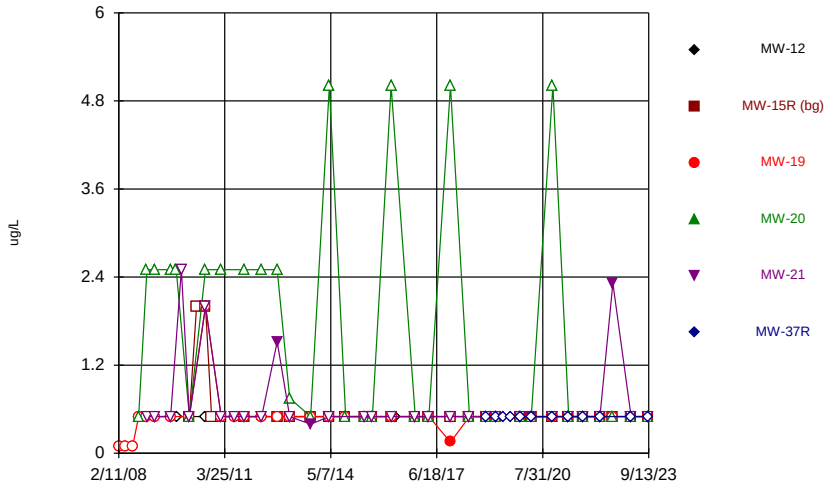
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Cadmium Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

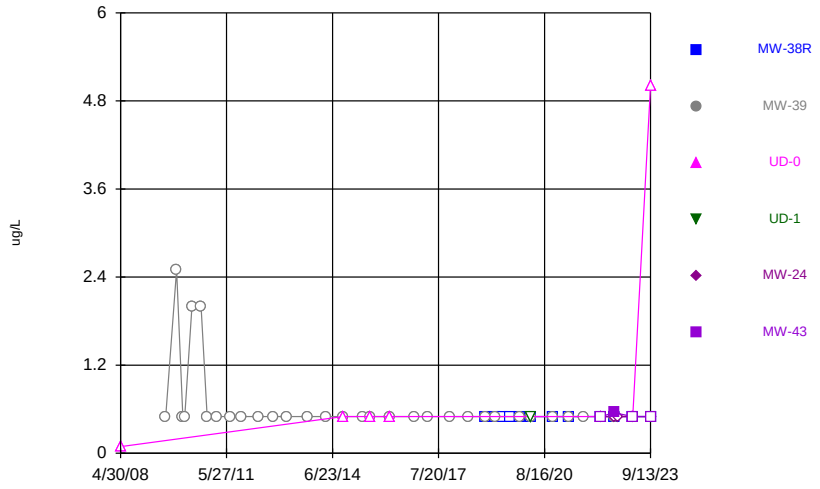
Time Series



Constituent: Carbon Disulfide Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

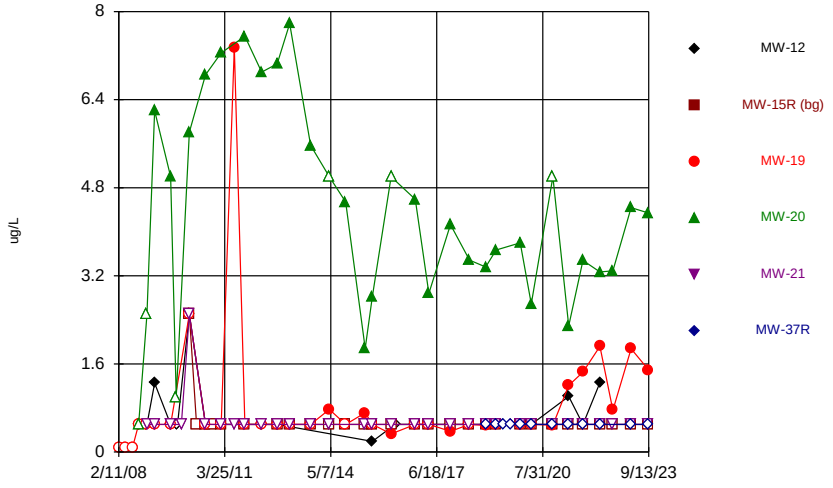
Time Series



Constituent: Carbon Disulfide Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

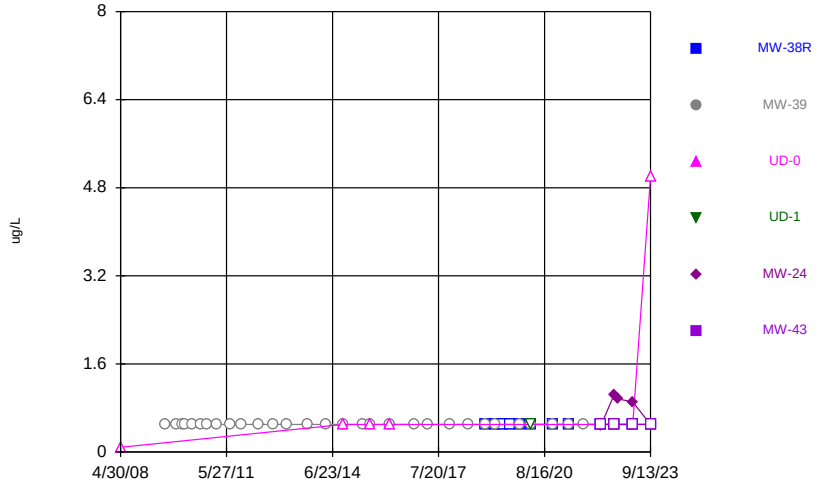
Time Series



Constituent: Chlorobenzene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

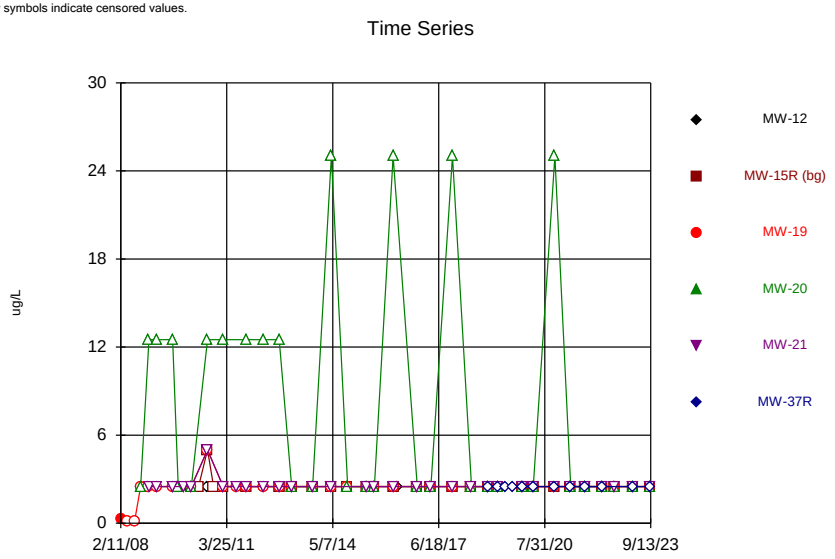
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



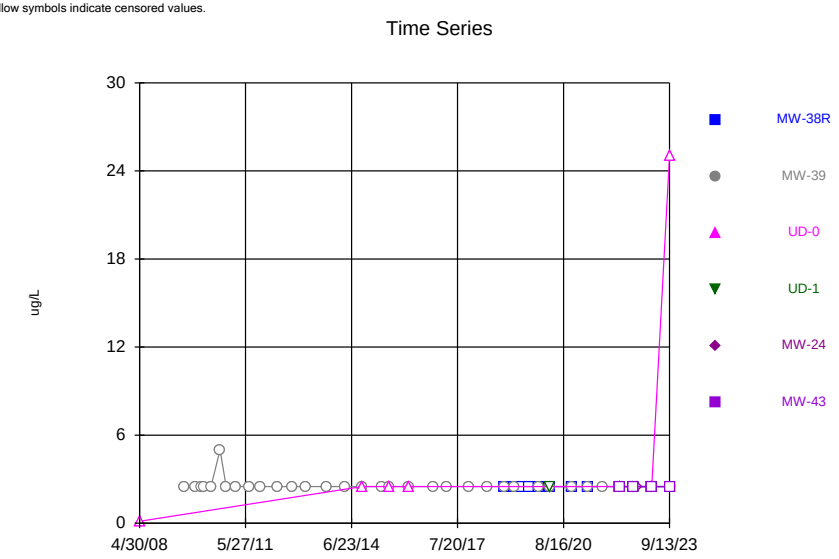
Constituent: Chlorobenzene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



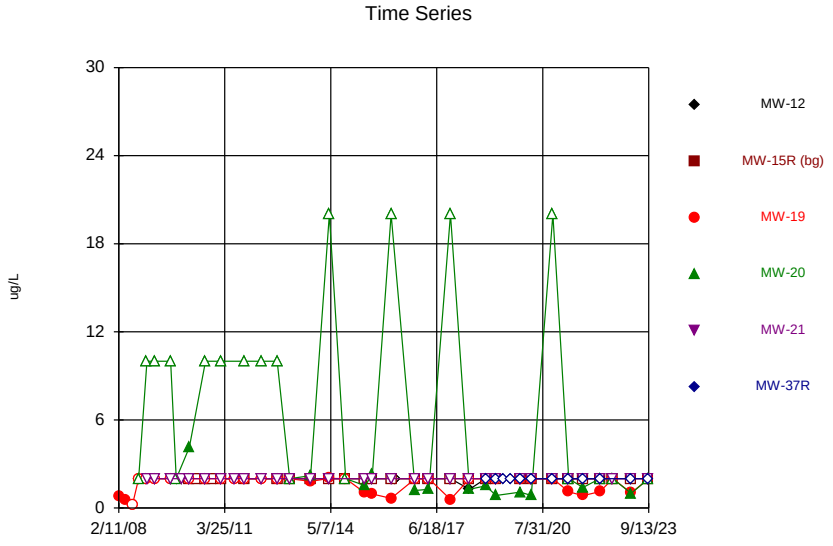
Constituent: Chlorodibromomethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



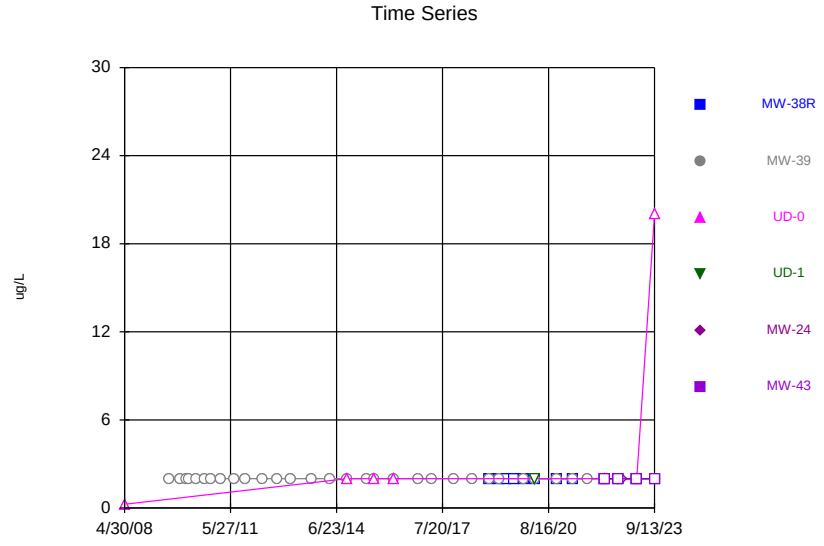
Constituent: Chlorodibromomethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



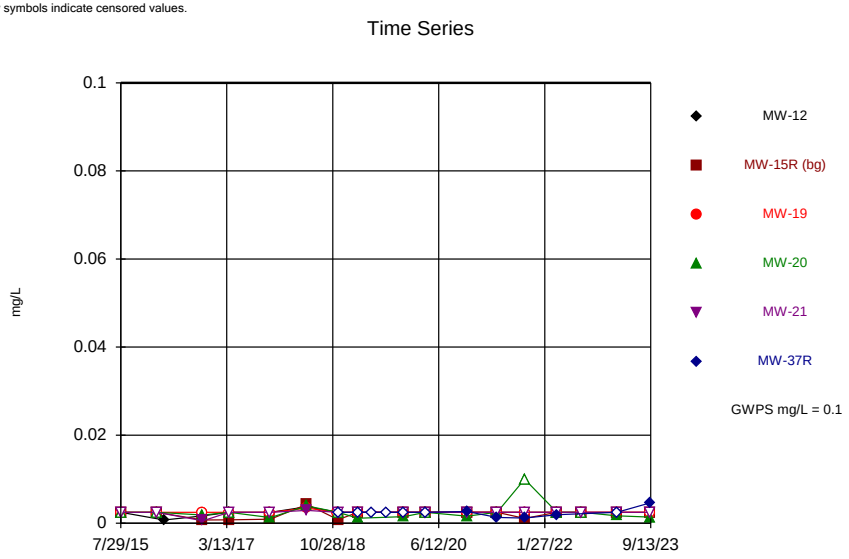
Constituent: Chloroethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



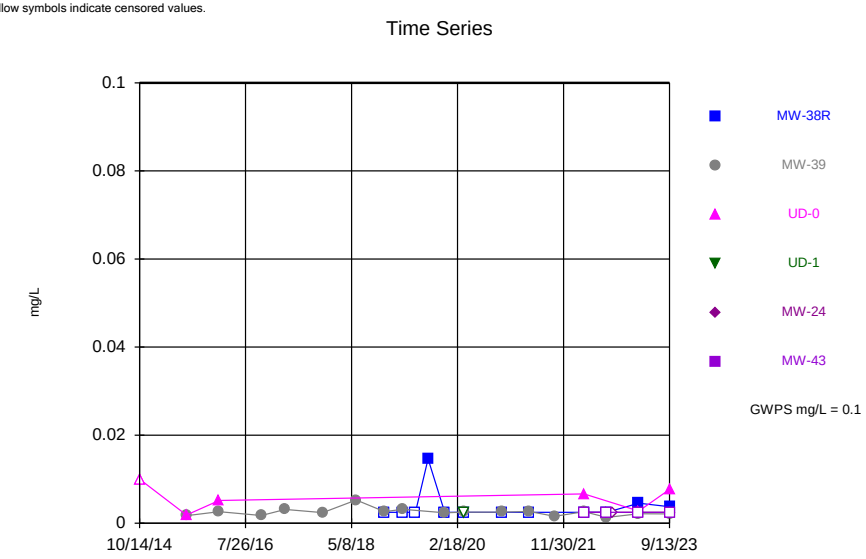
Constituent: Chloroethane Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



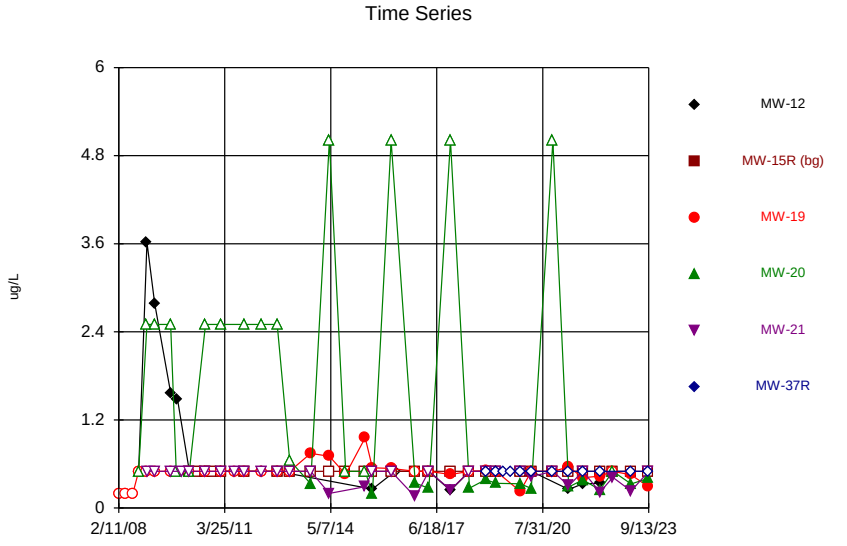
Constituent: Chromium Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



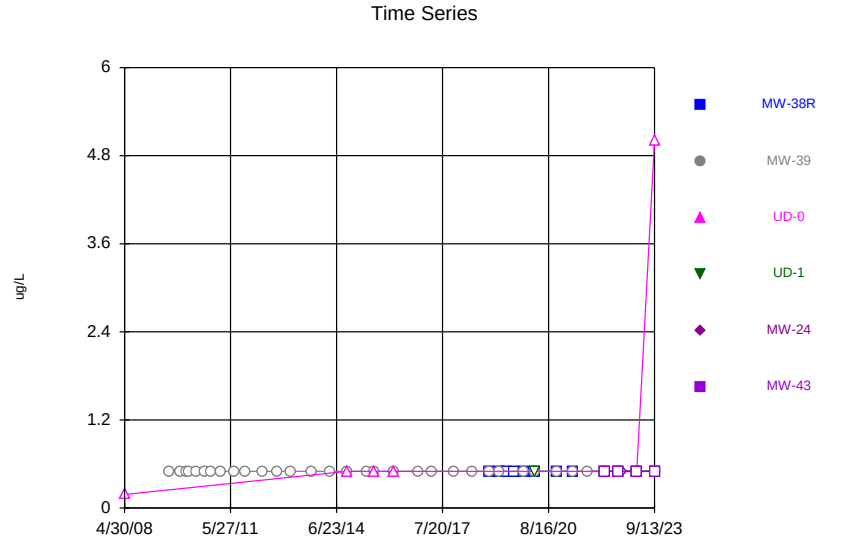
Constituent: Chromium Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



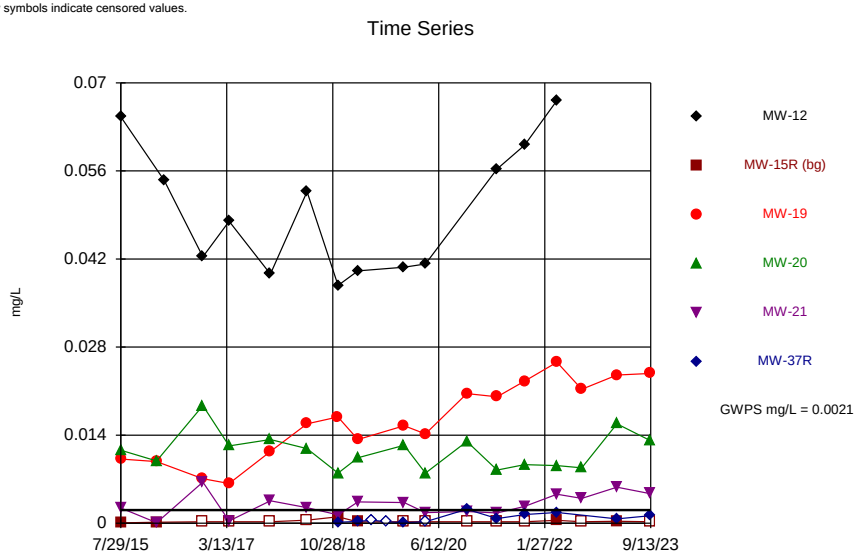
Constituent: cis-1,2-Dichloroethene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



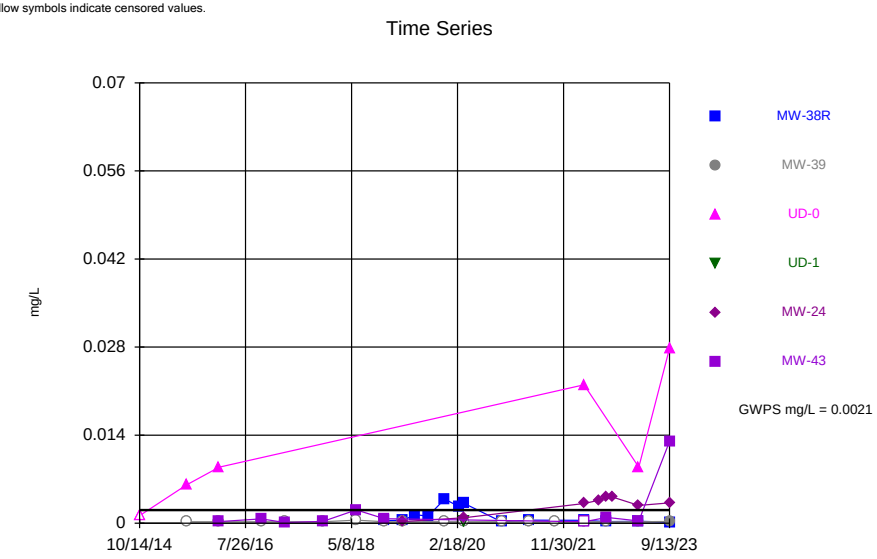
Constituent: cis-1,2-Dichloroethene Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Cobalt Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Cobalt Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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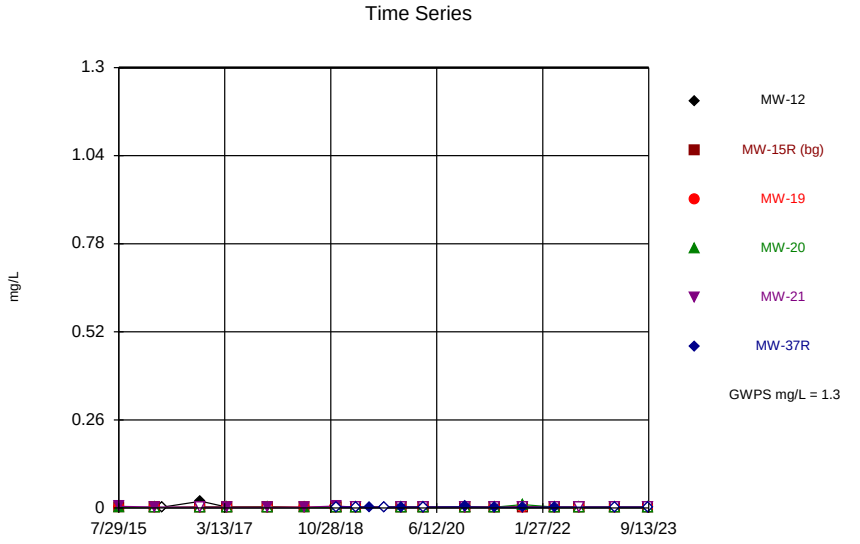

Constituent: Copper Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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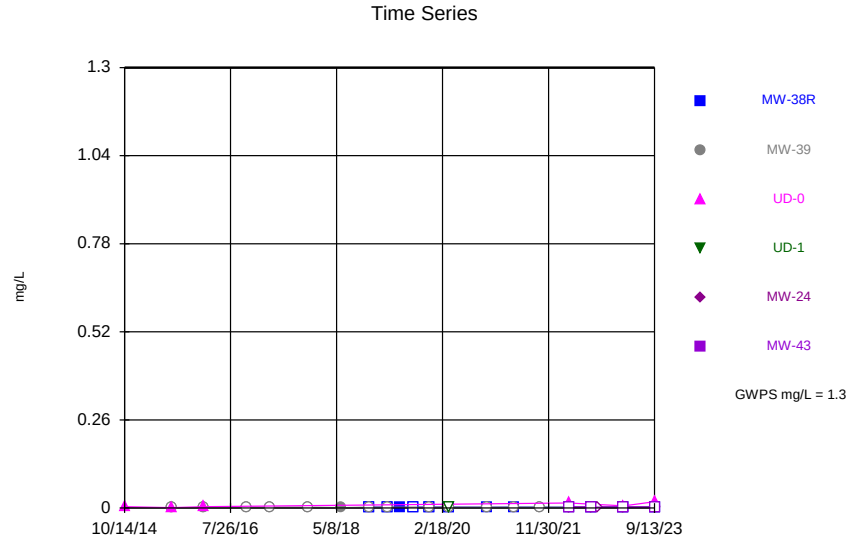

Constituent: Copper Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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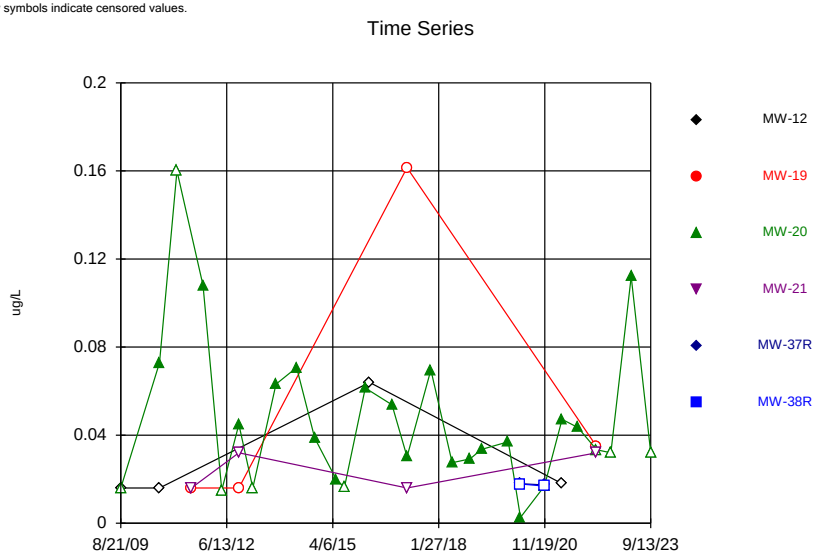
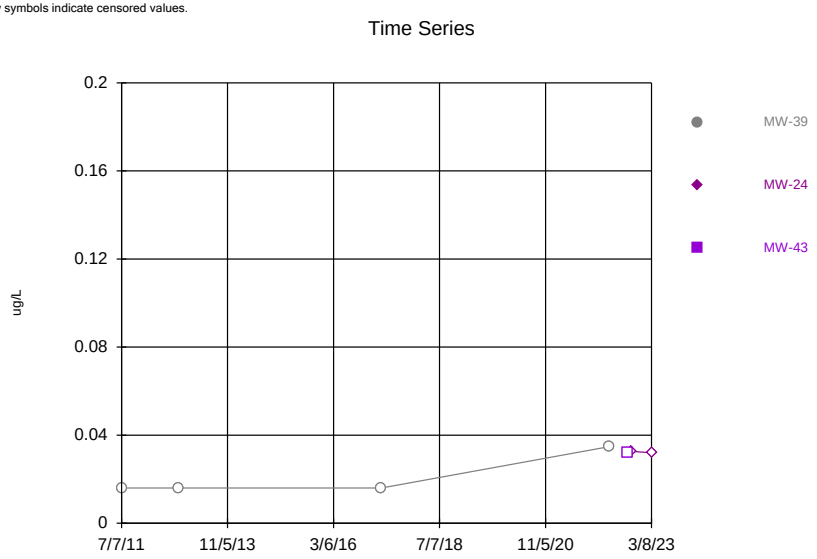


Constituent: Endosulfan I Analysis Run 10/18/2023 2:18 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Endosulfan I Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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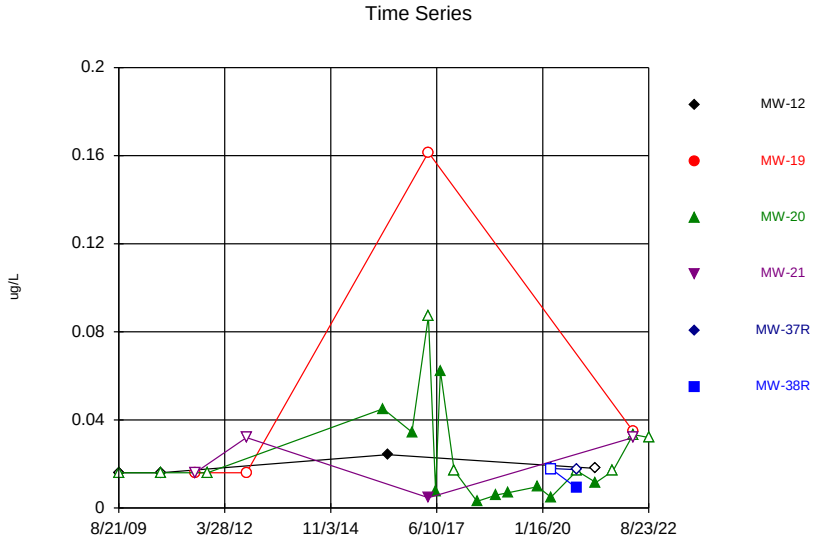
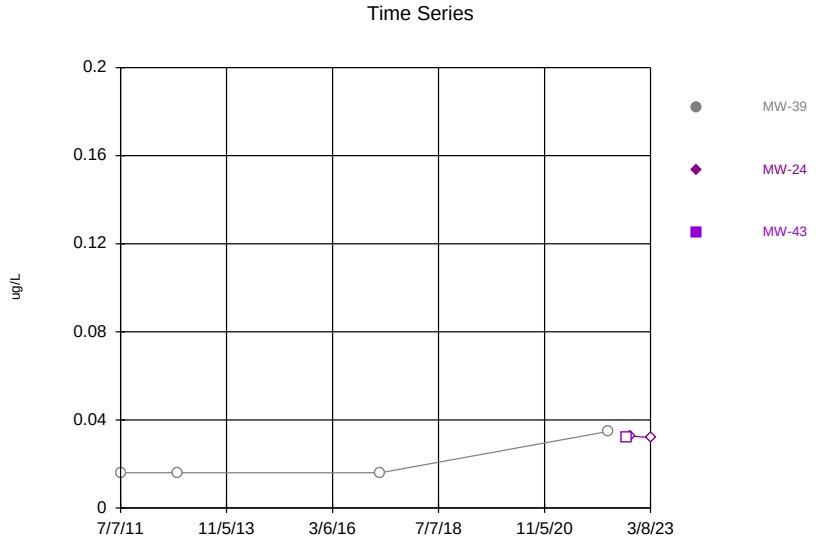


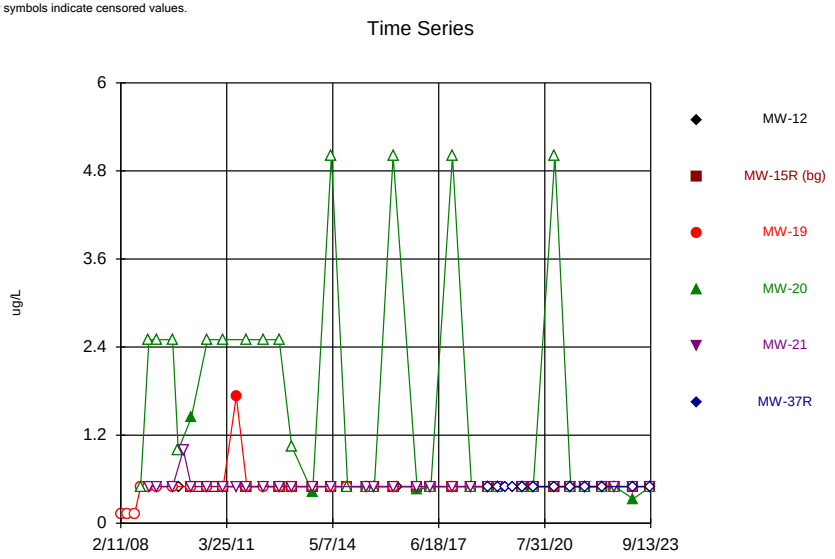
Constituent: Endosulfan sulfate Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



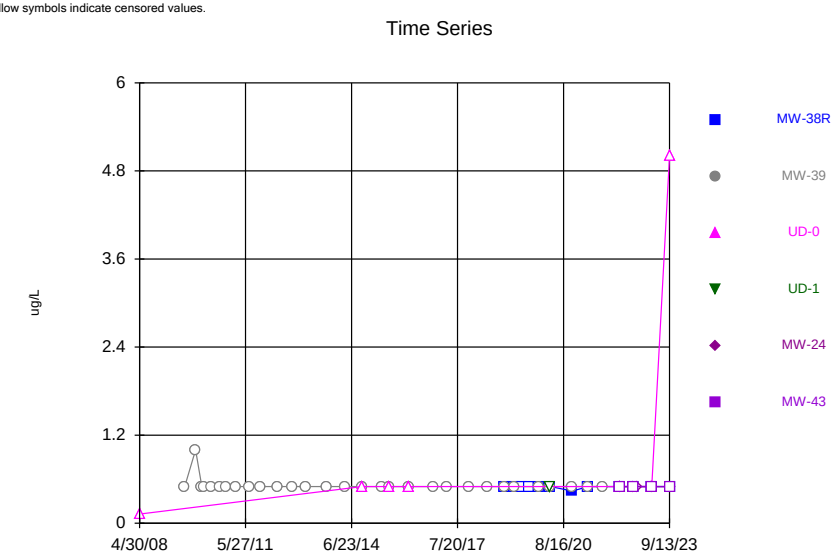
Constituent: Endosulfan sulfate Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



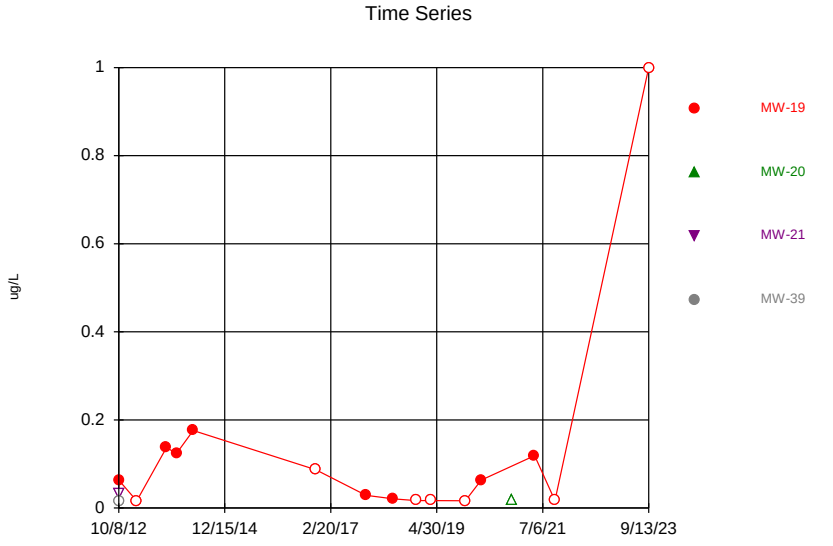
Constituent: Ethylbenzene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



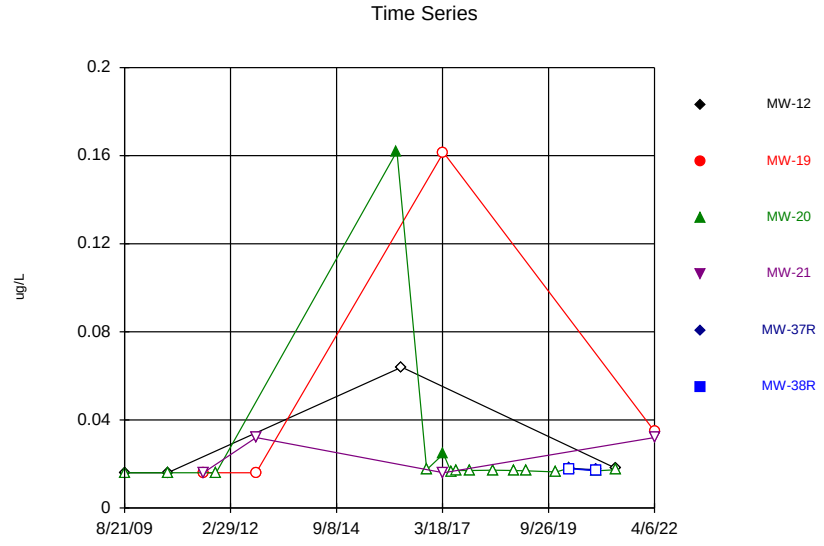
Constituent: Ethylbenzene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: gamma-Chlordane Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

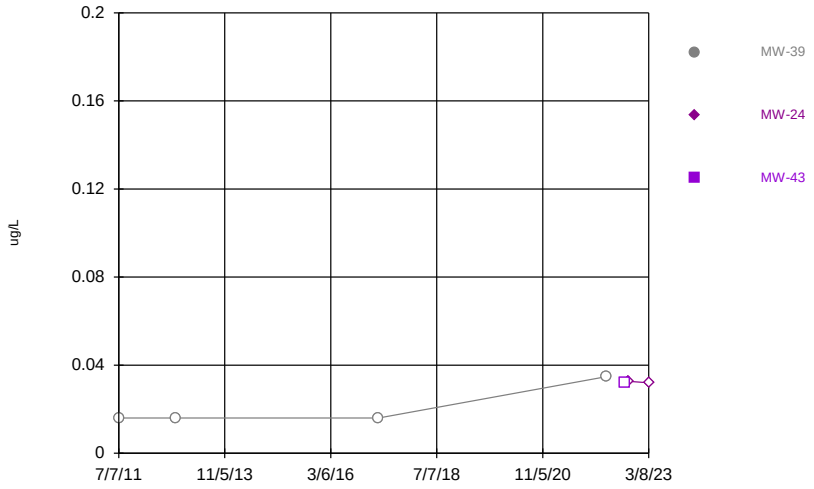
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Heptachlor Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

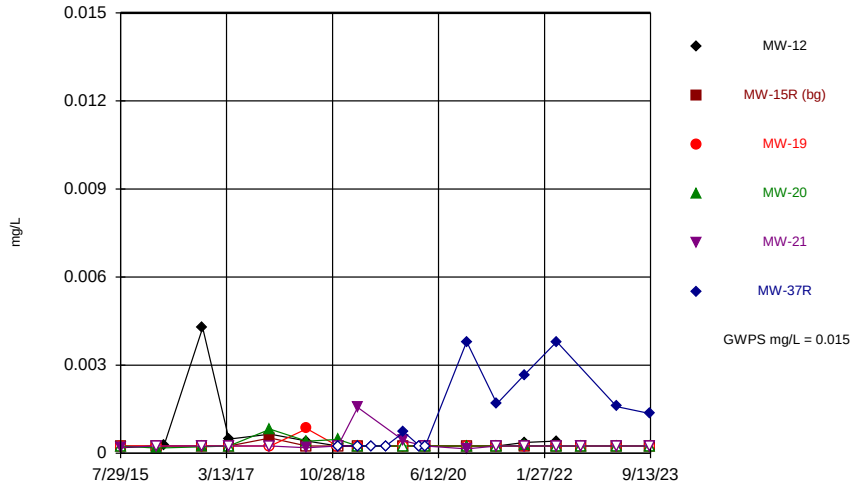
Time Series



Constituent: Heptachlor Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

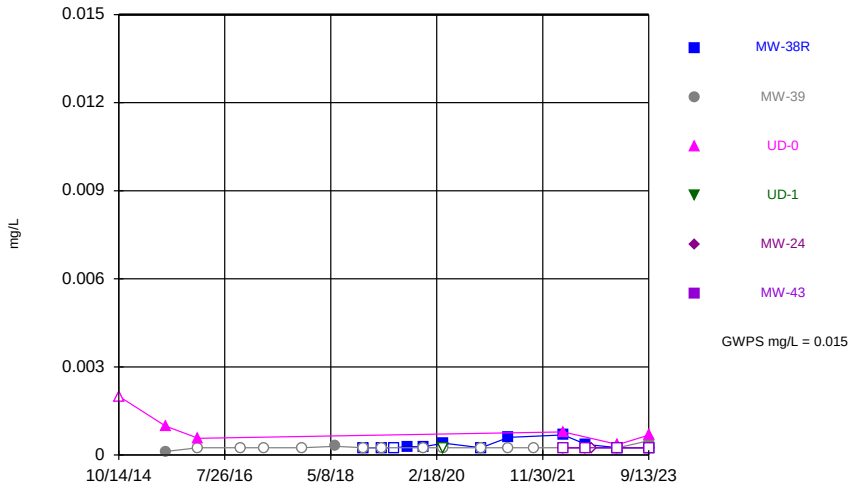
Time Series



Constituent: Lead Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

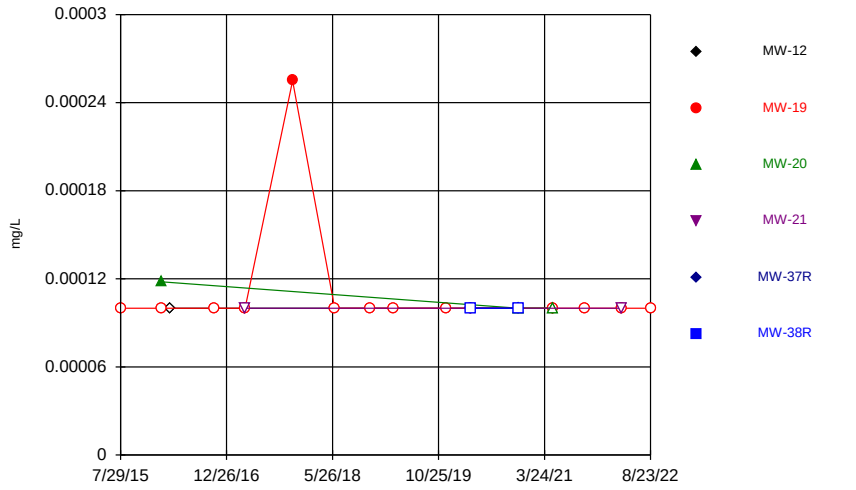
Time Series



Constituent: Lead Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

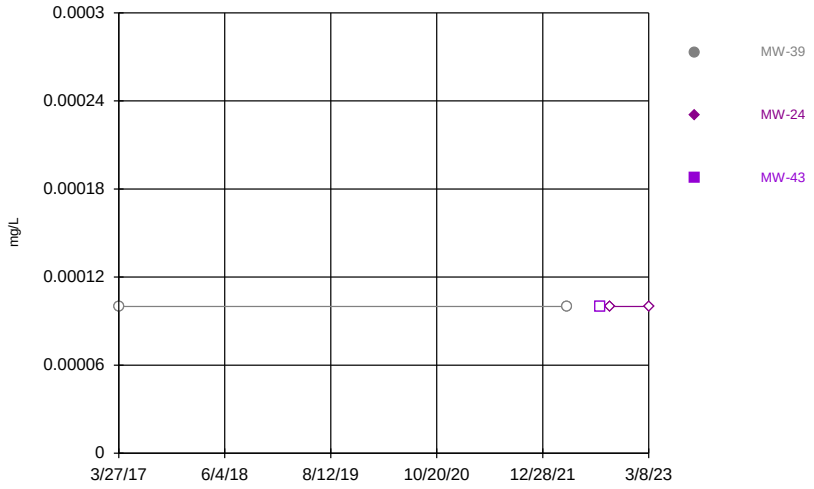
Time Series



Constituent: Mercury Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

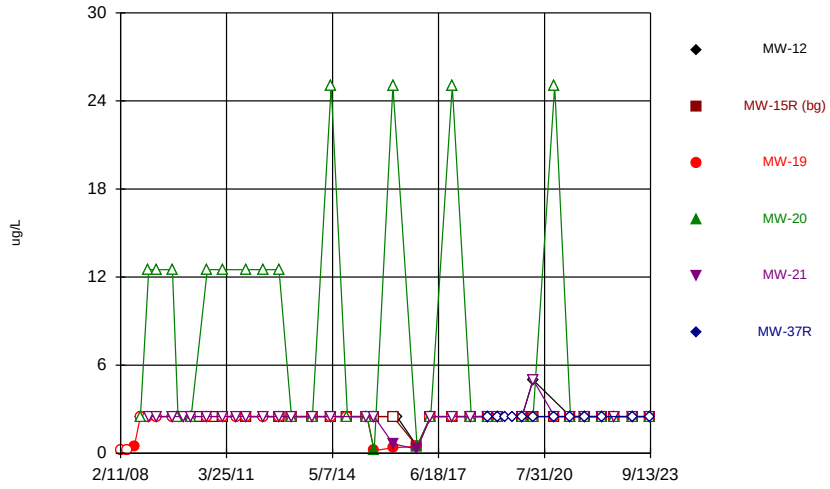
Time Series



Constituent: Mercury Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

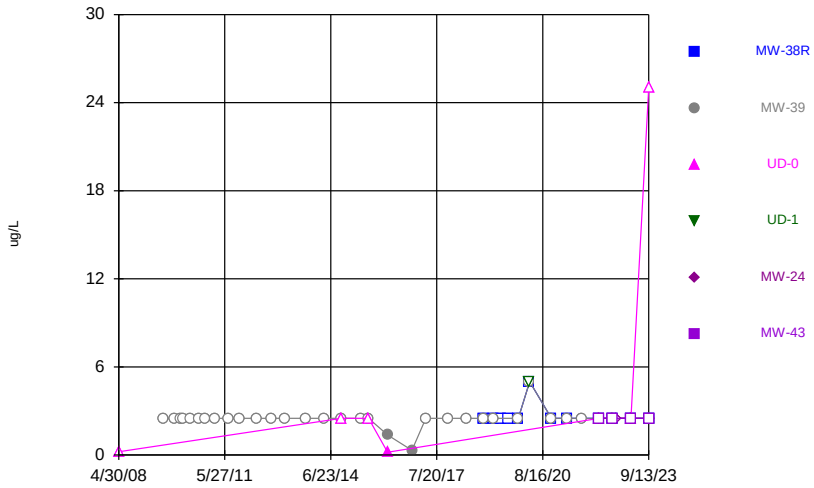
Time Series



Constituent: Methylene Chloride Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

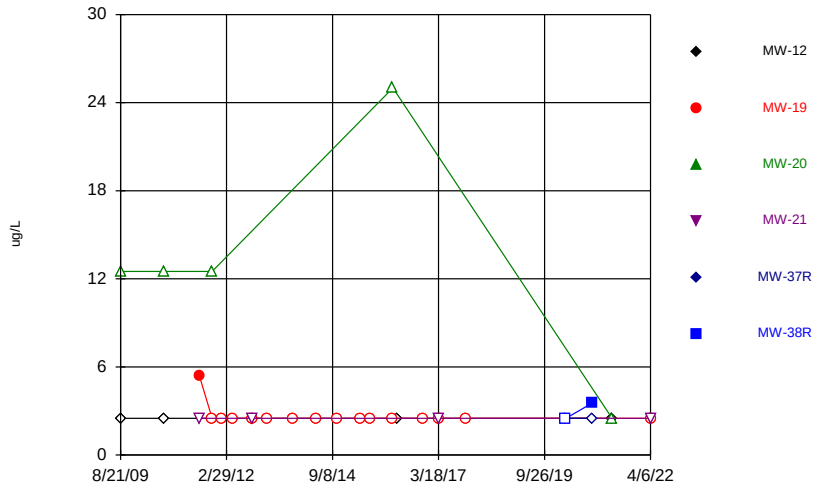
Time Series



Constituent: Methylene Chloride Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

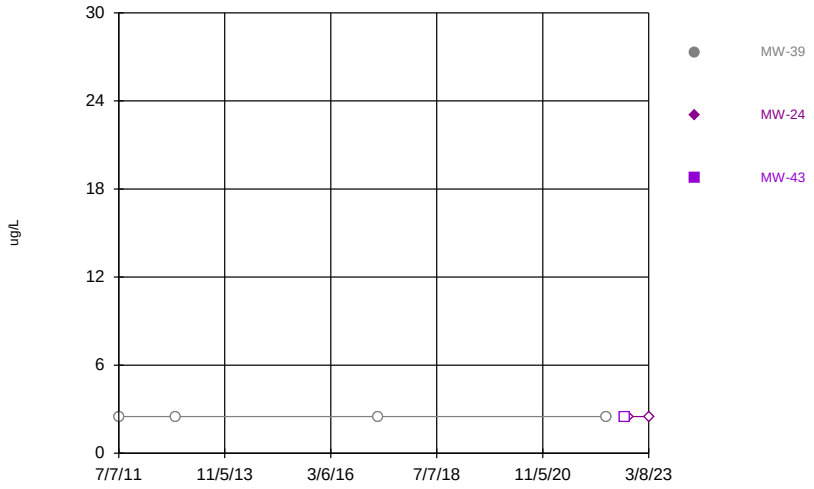
Time Series



Constituent: Naphthalene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

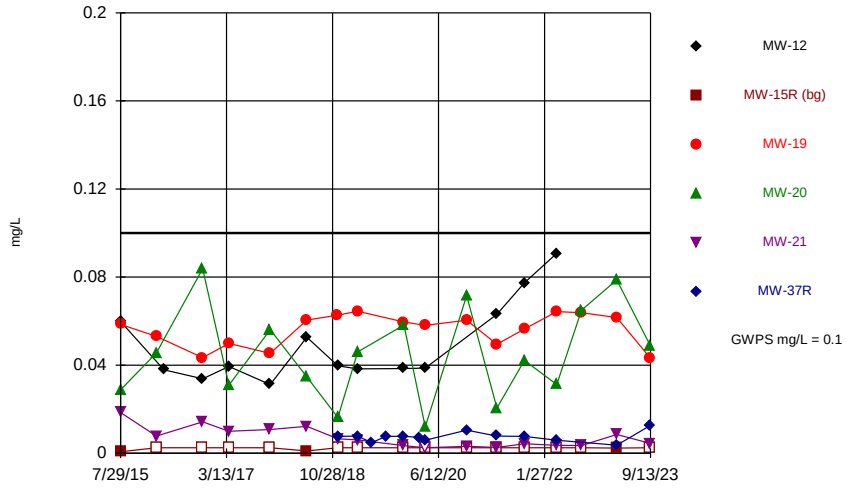
Time Series



Constituent: Naphthalene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

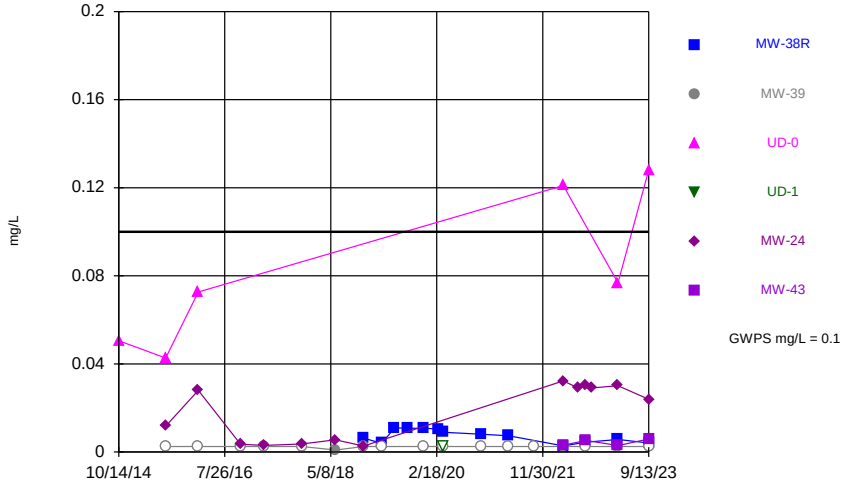
Time Series



Constituent: Nickel Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Nickel Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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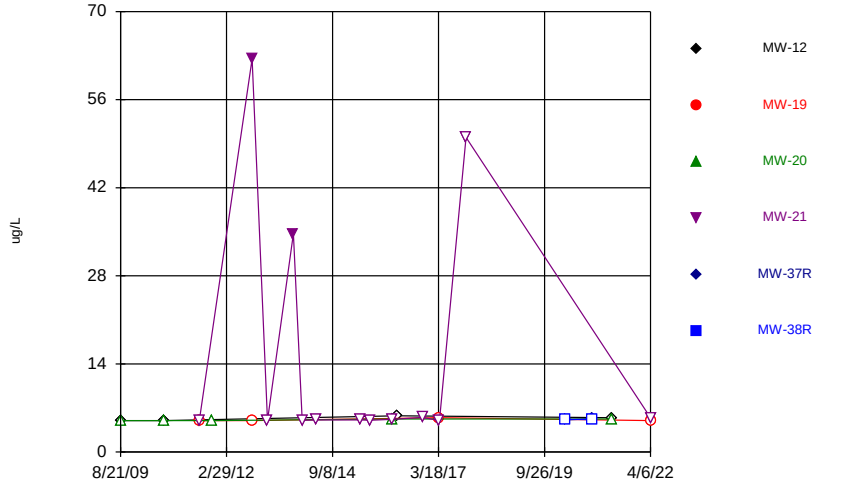
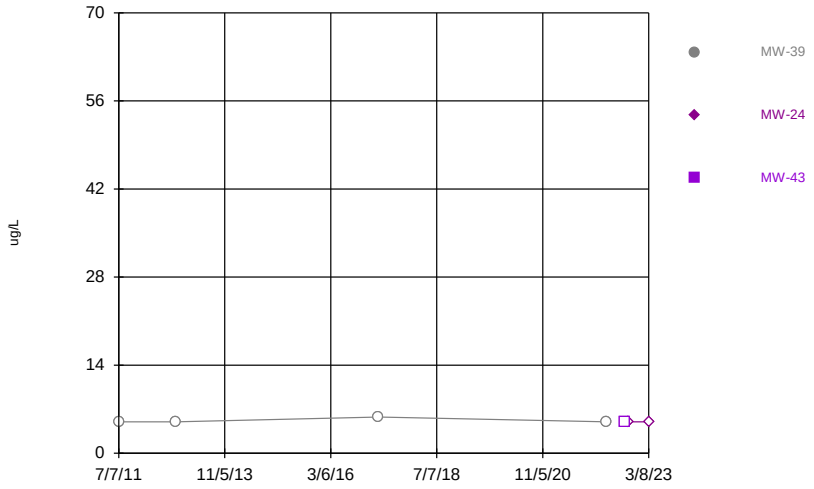


Constituent: Phenol Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Phenol Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
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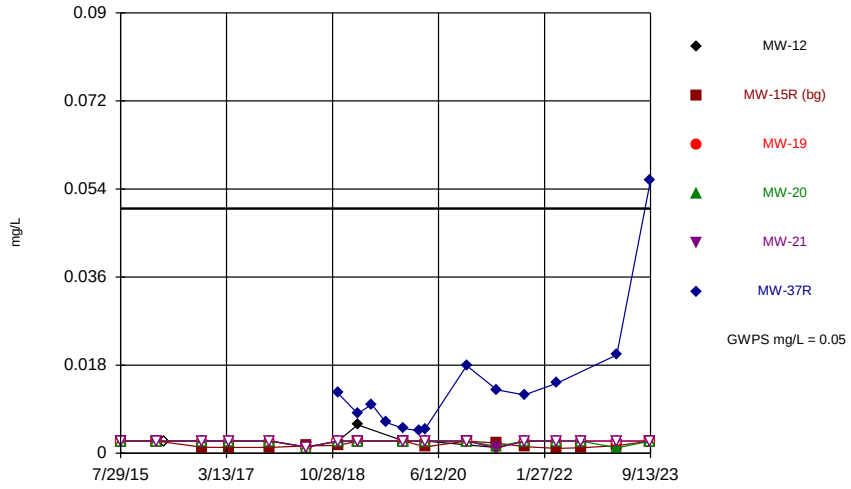
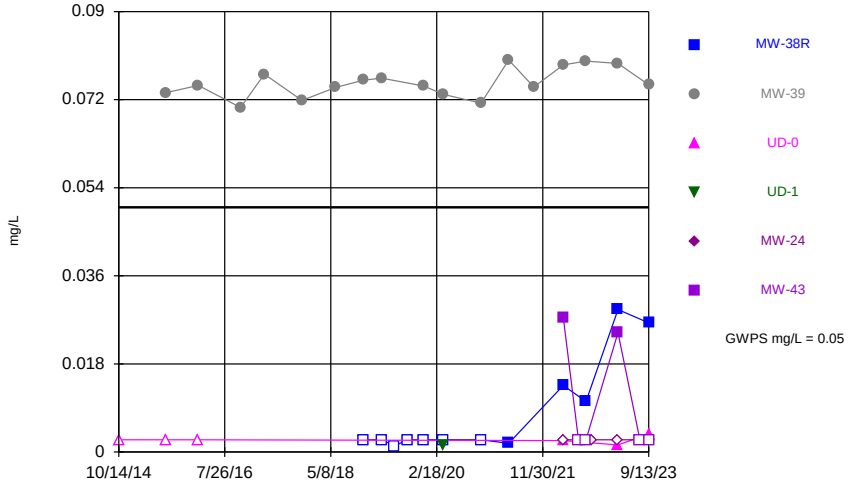


Constituent: Selenium Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

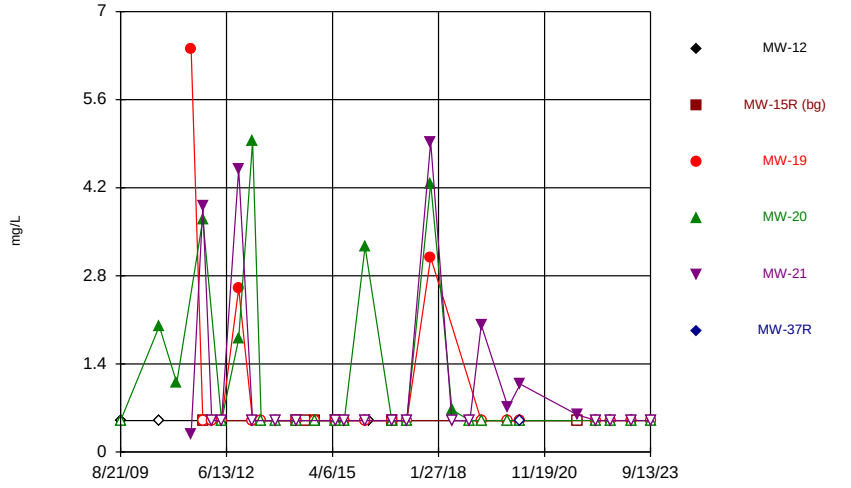
Time Series



Constituent: Selenium Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

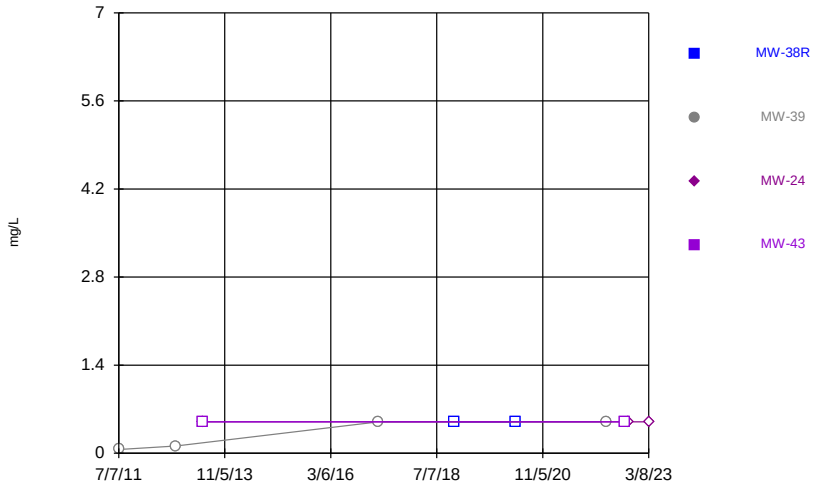
Time Series



Constituent: Sulfide Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

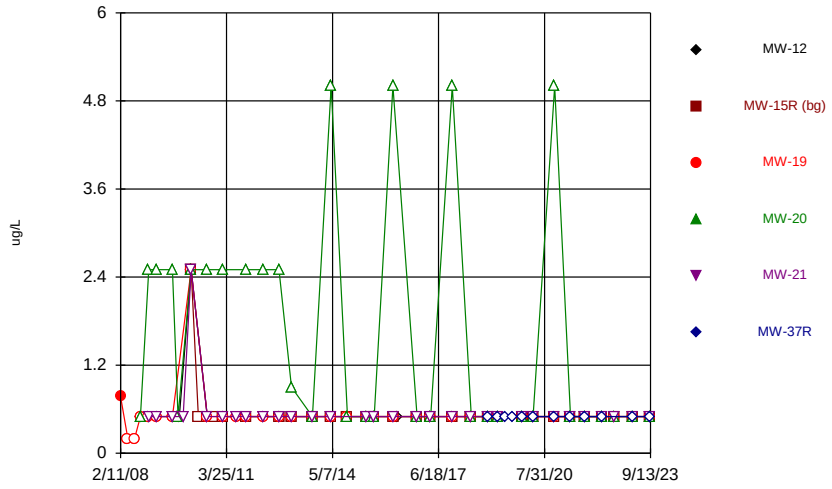
Time Series



Constituent: Sulfide Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

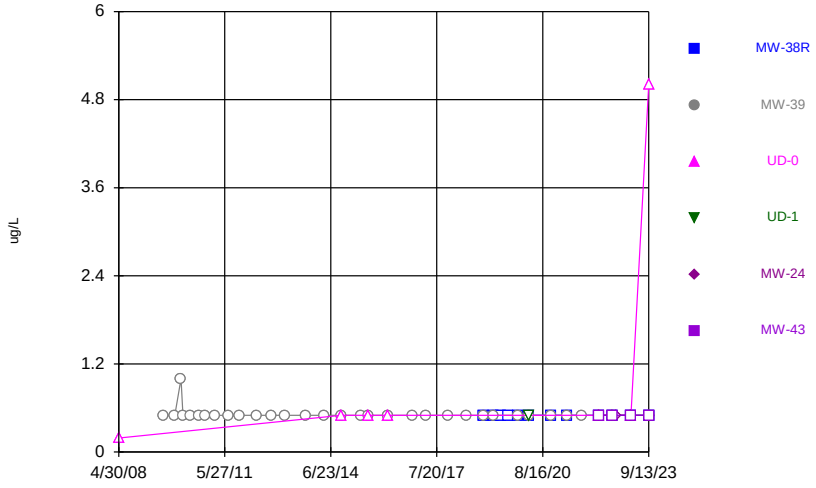
Time Series



Constituent: Tetrachloroethene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

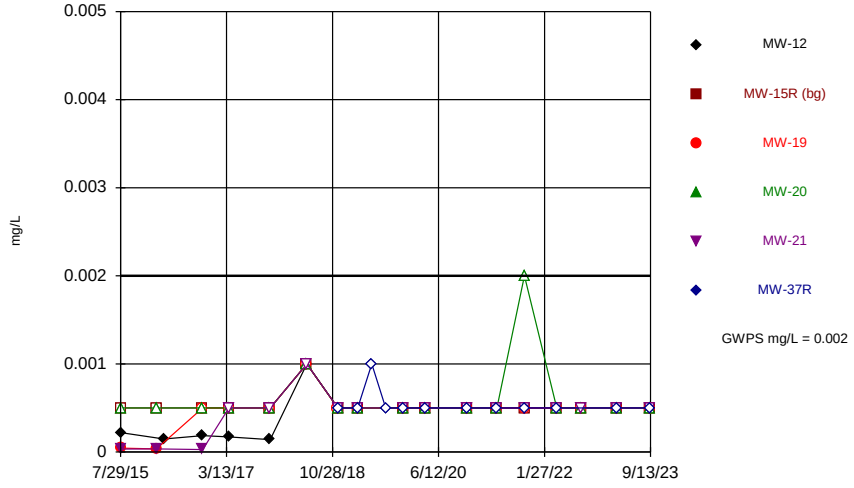
Time Series



Constituent: Tetrachloroethene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

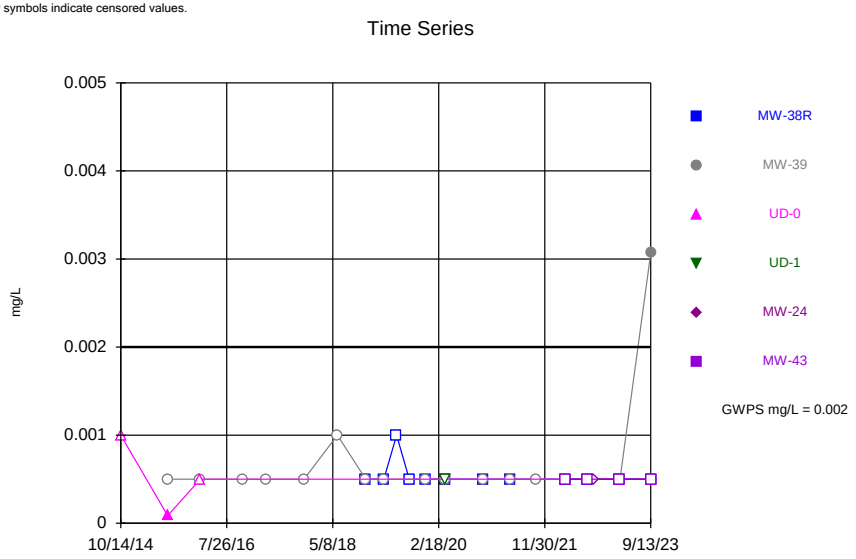
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Thallium Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

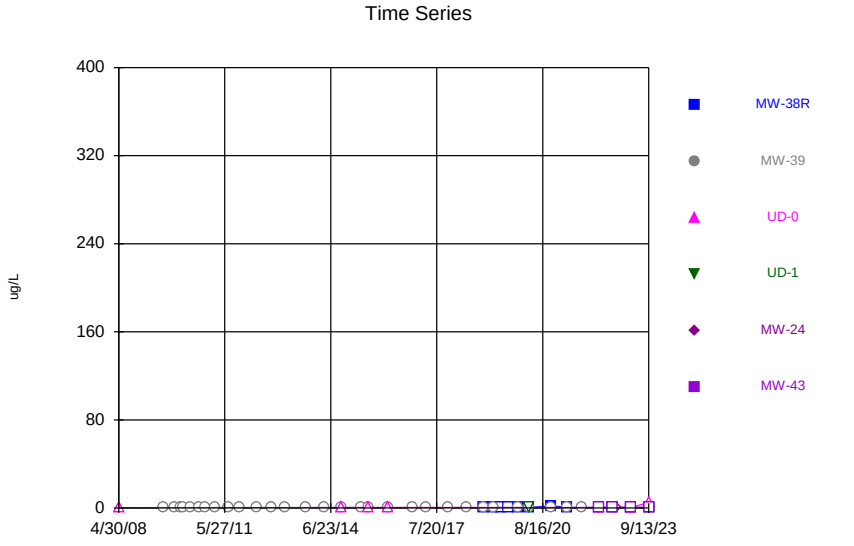


Constituent: Thallium Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

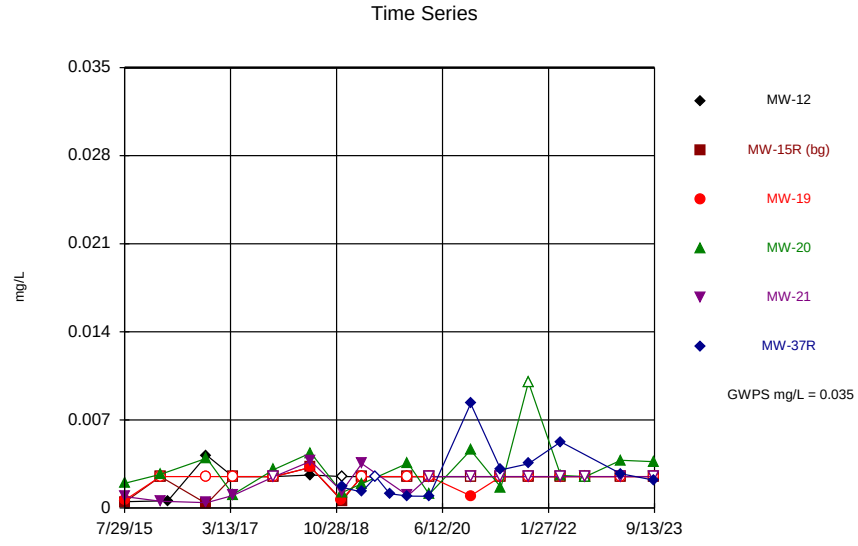
Constituent: Toluene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Toluene Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

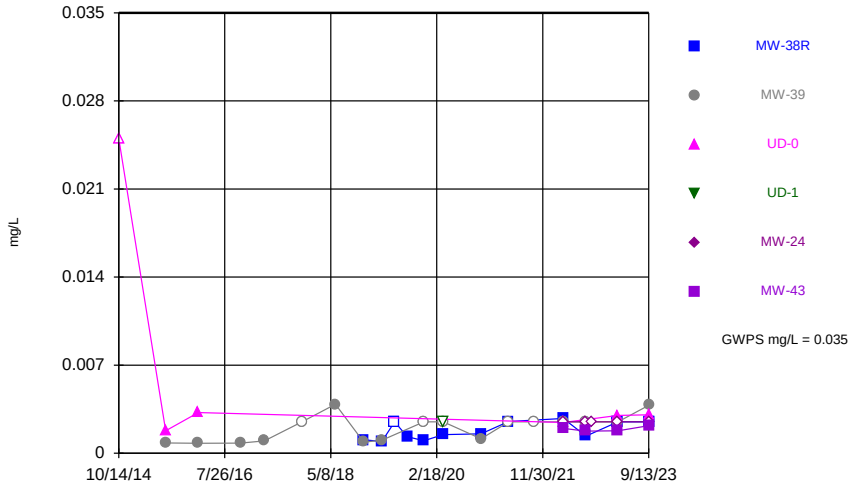
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Vanadium Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: Vanadium Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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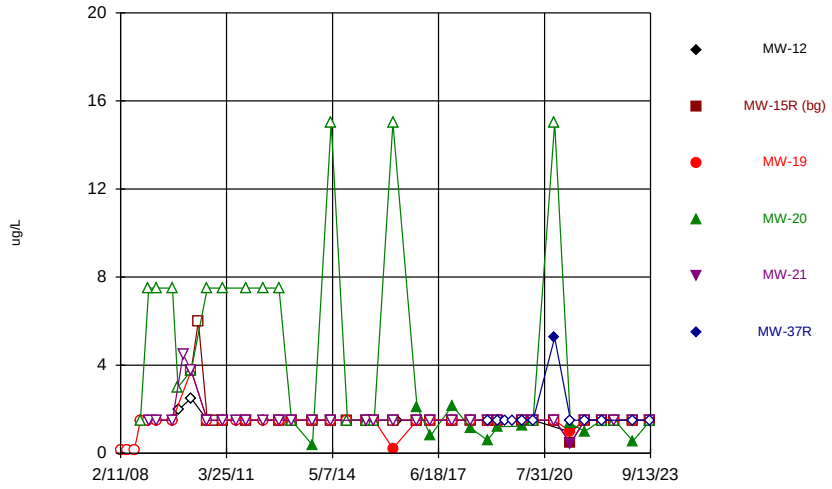
Hollow symbols indicate censored values.

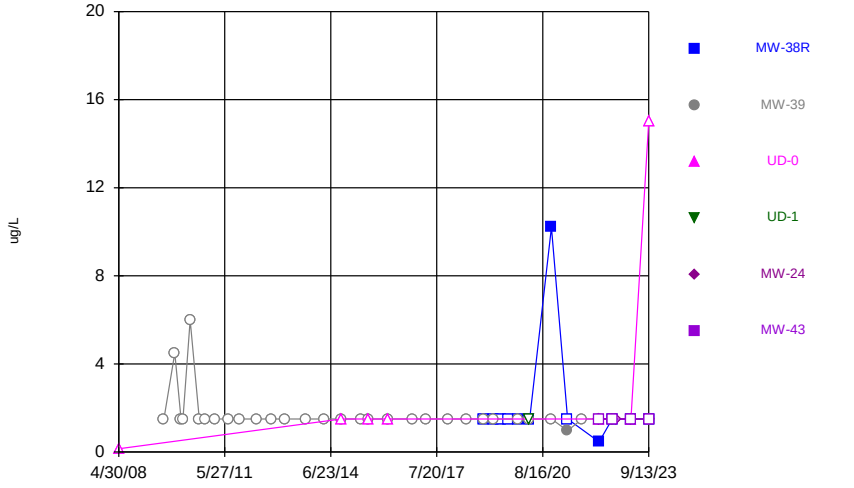
Time Series



Constituent: Xylenes, total Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

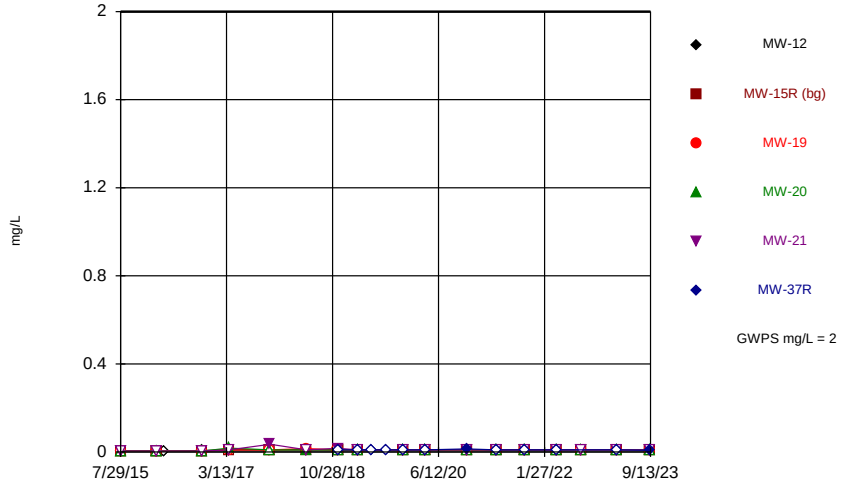
Time Series



Constituent: Xylenes, total Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

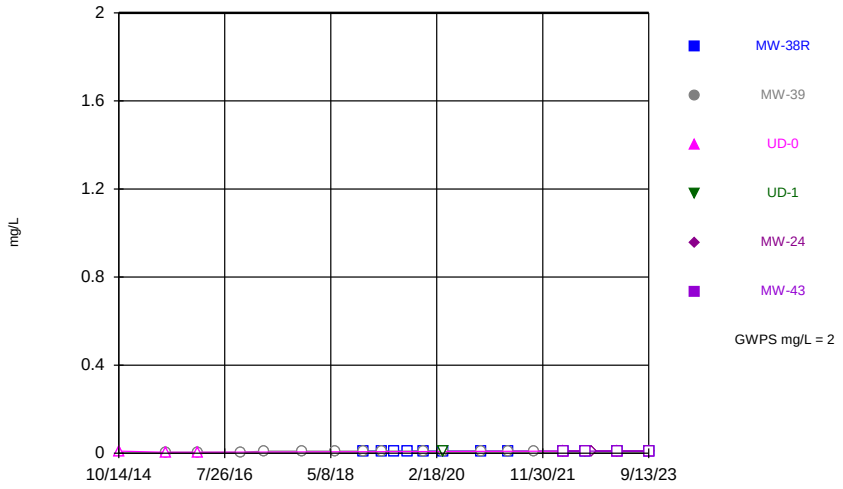
Time Series



Constituent: Zinc Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series

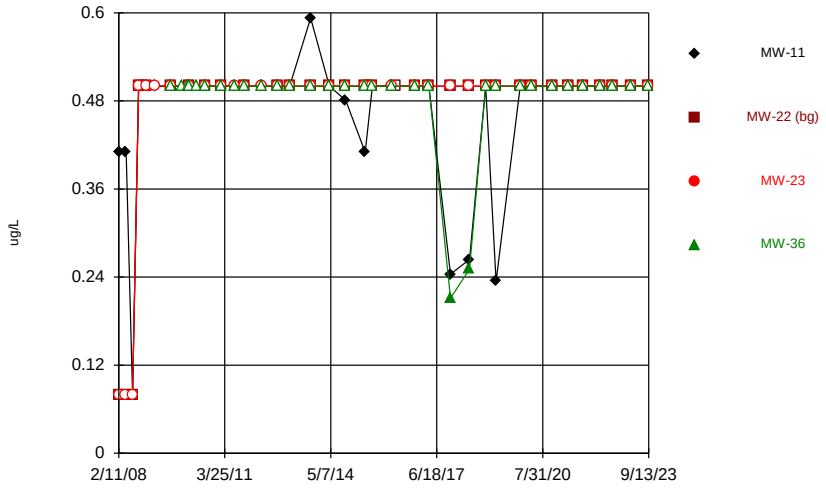


Constituent: Zinc Analysis Run 10/18/2023 2:19 PM View: 2023AWQR - Time Series
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Time Series Plots –
Dakota Sandstone

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

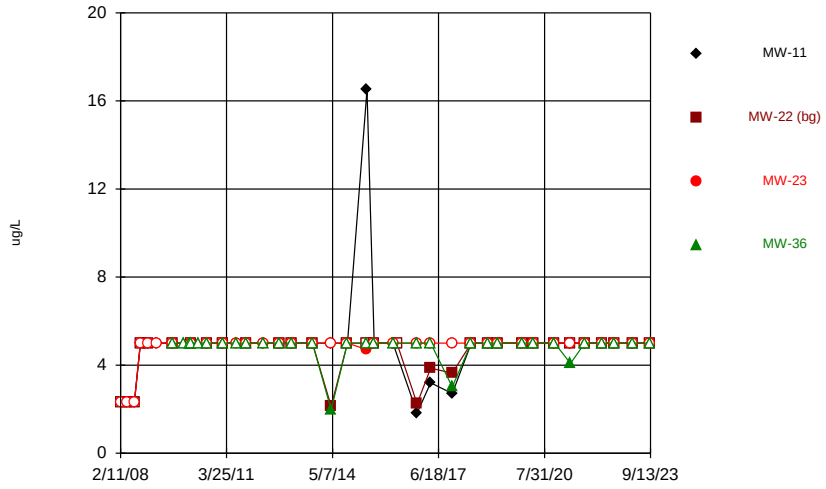
Time Series



Constituent: 1,4-Dichlorobenzene Analysis Run 10/18/2023 10:30 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

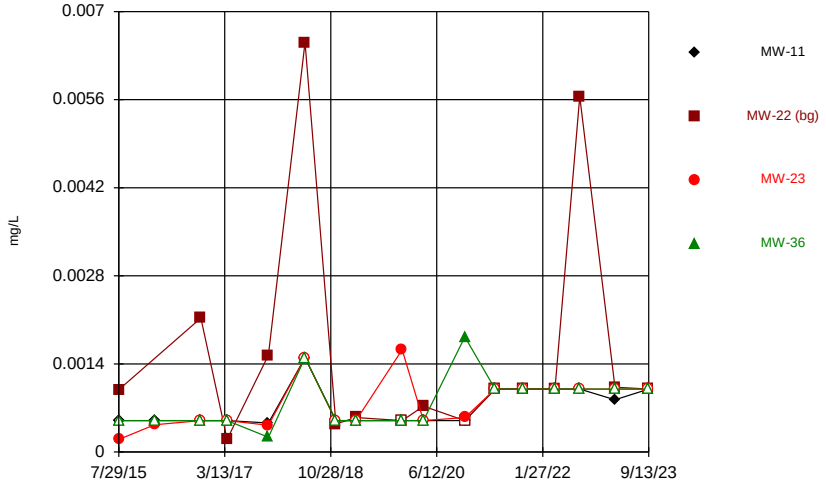
Time Series



Constituent: Acetone Analysis Run 10/18/2023 10:30 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

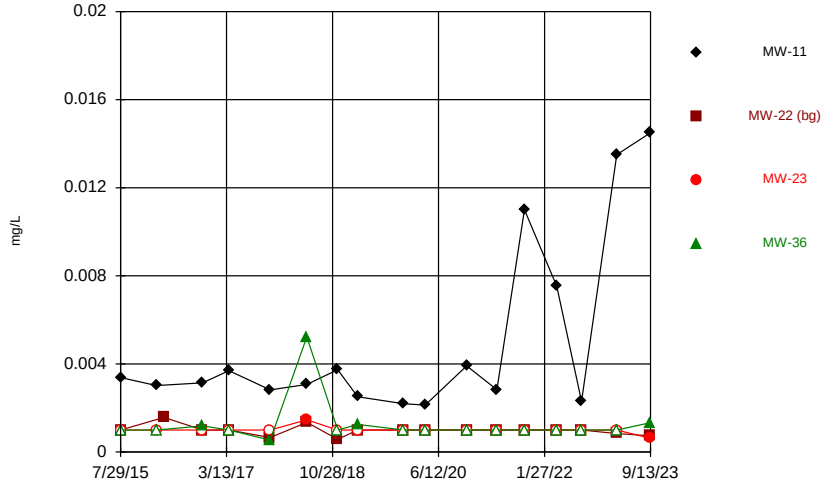
Time Series



Constituent: Antimony Analysis Run 10/18/2023 10:30 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

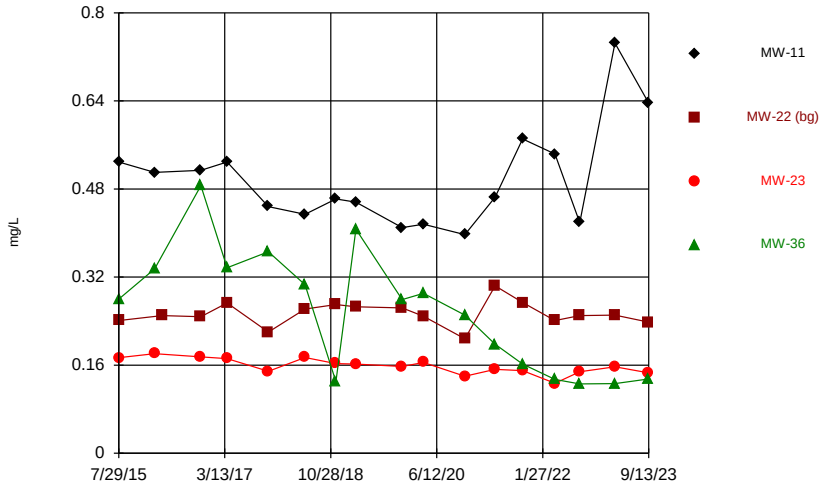
Time Series



Constituent: Arsenic Analysis Run 10/18/2023 10:30 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

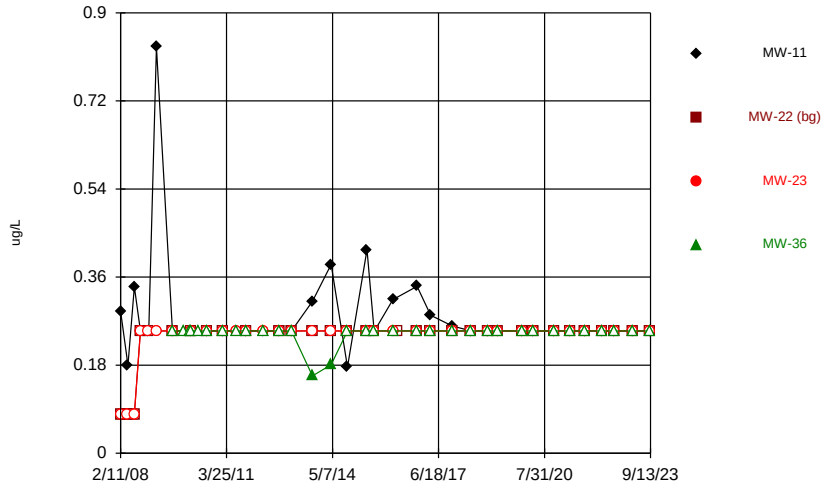
Time Series



Constituent: Barium Analysis Run 10/18/2023 10:30 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

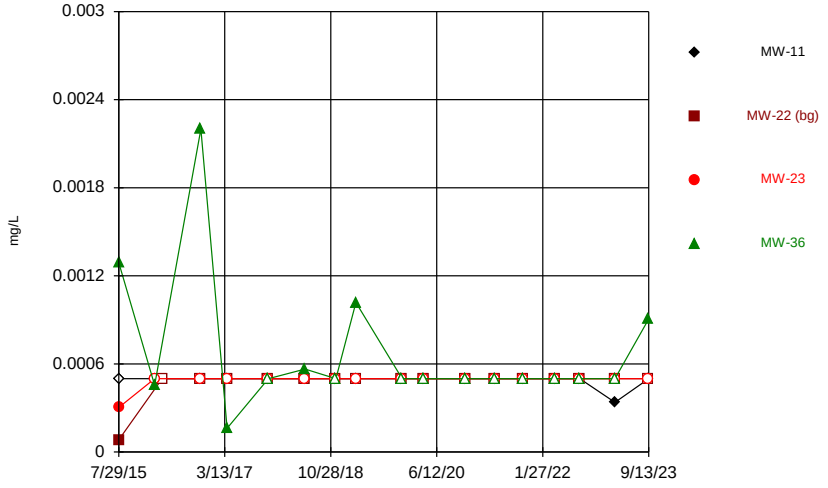
Time Series



Constituent: Benzene Analysis Run 10/18/2023 10:30 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

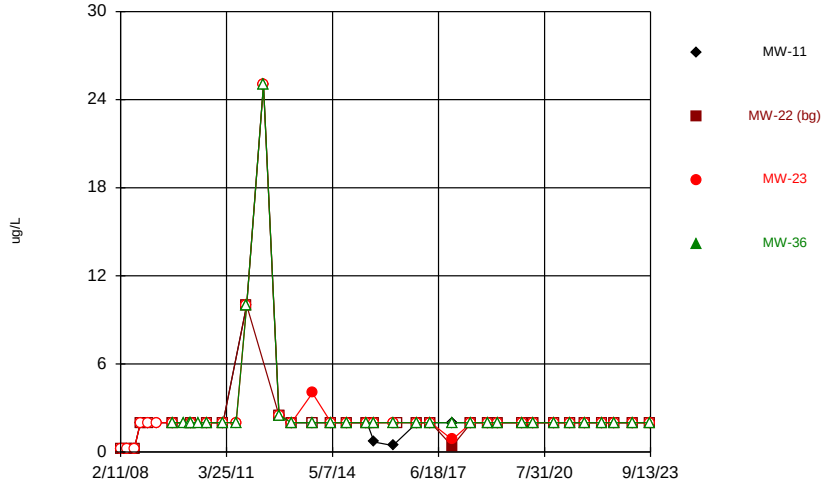
Time Series



Constituent: Beryllium Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

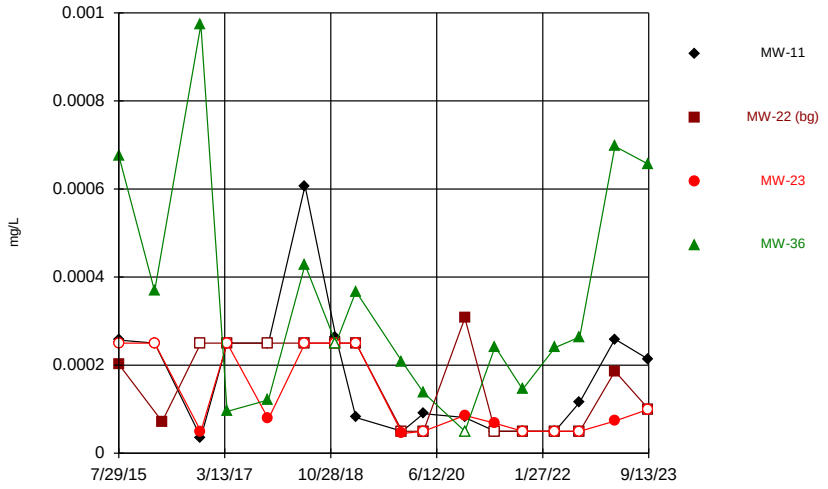
Time Series



Constituent: Bromomethane Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

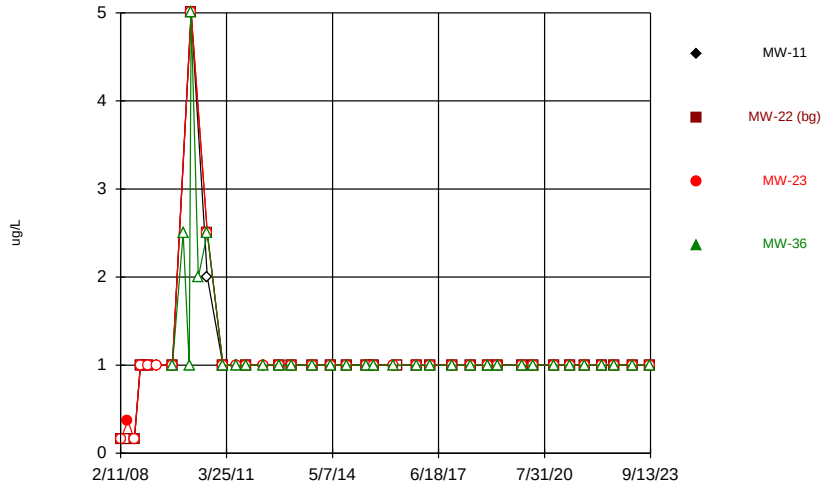
Time Series



Constituent: Cadmium Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

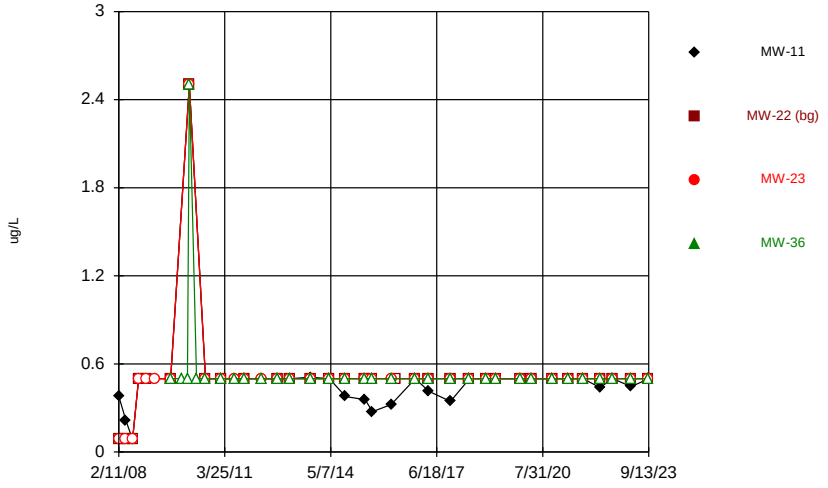
Time Series



Constituent: Carbon Tetrachloride Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

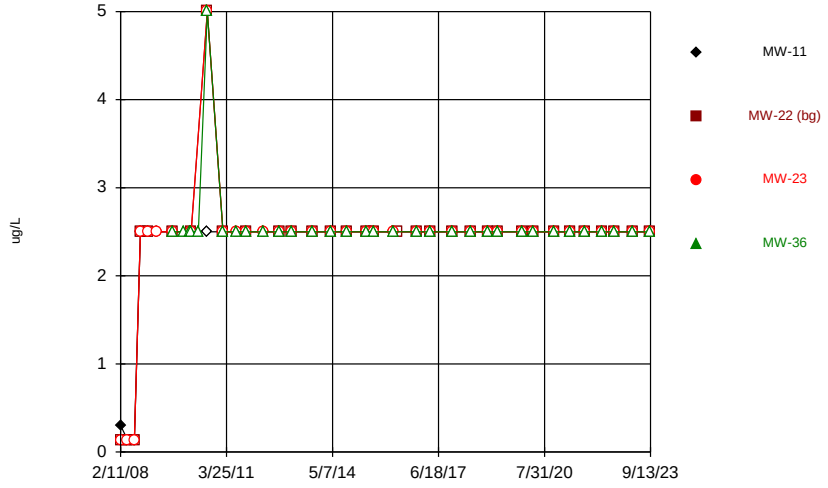
Time Series



Constituent: Chlorobenzene Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

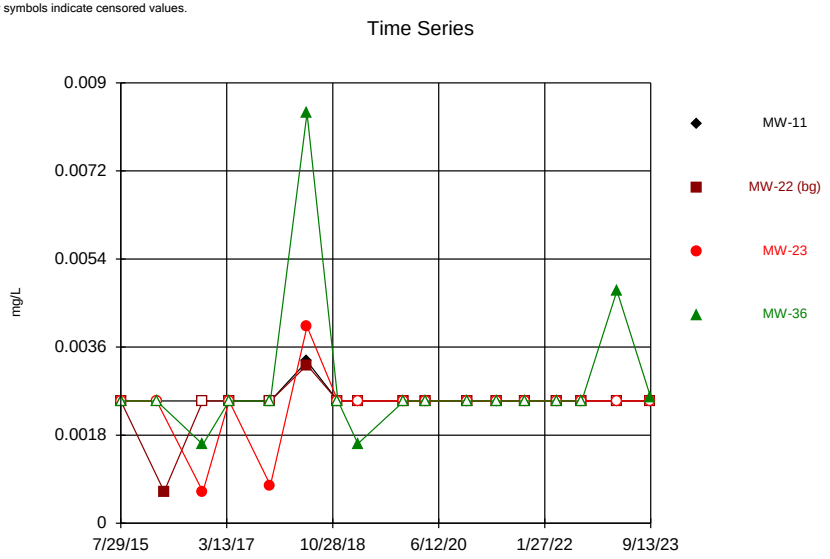
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



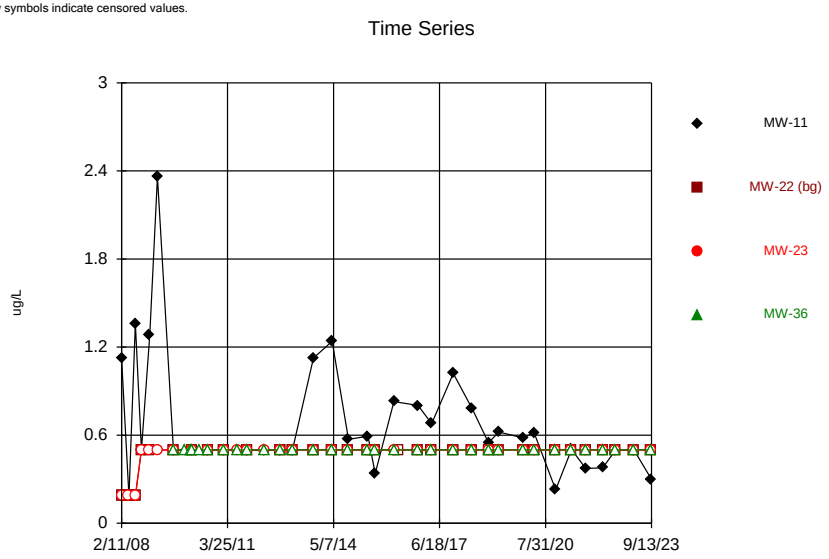
Constituent: Chlorodibromomethane Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



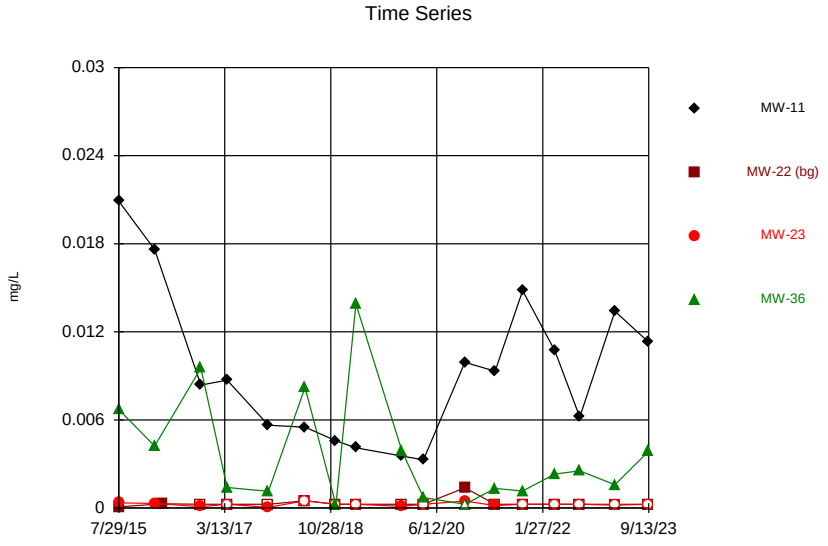
Constituent: Chromium Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



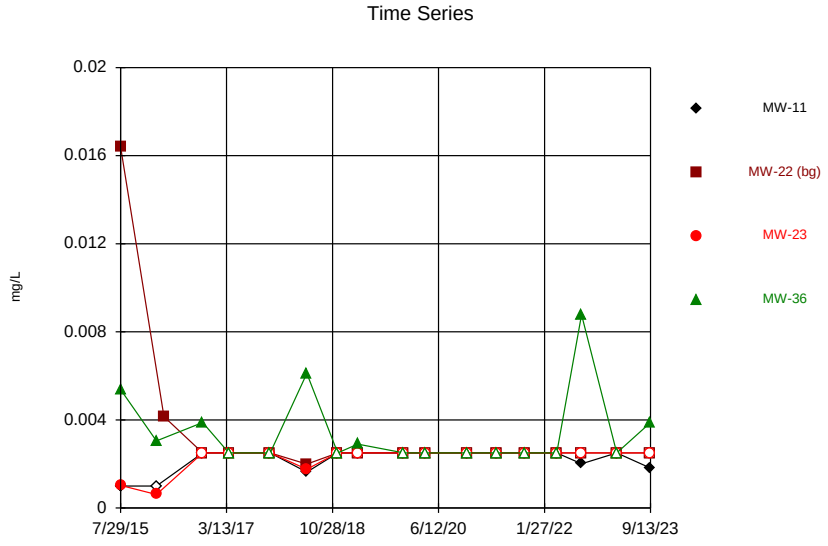
Constituent: cis-1,2-Dichloroethene Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Cobalt Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

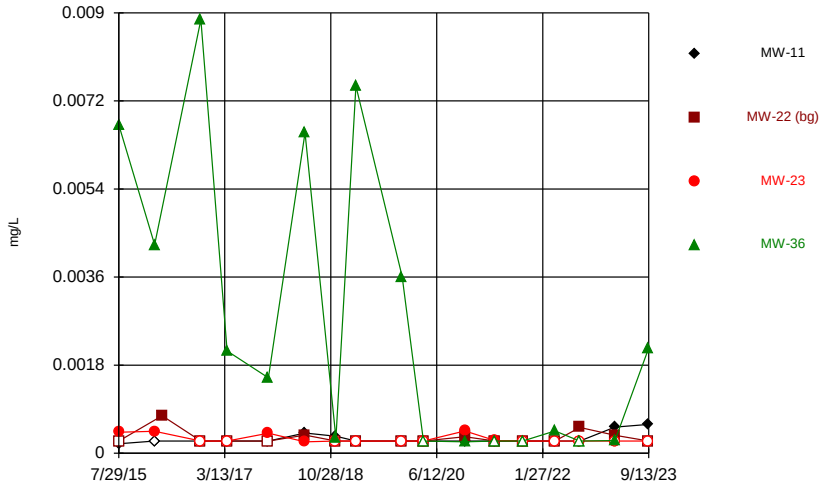
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Copper Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

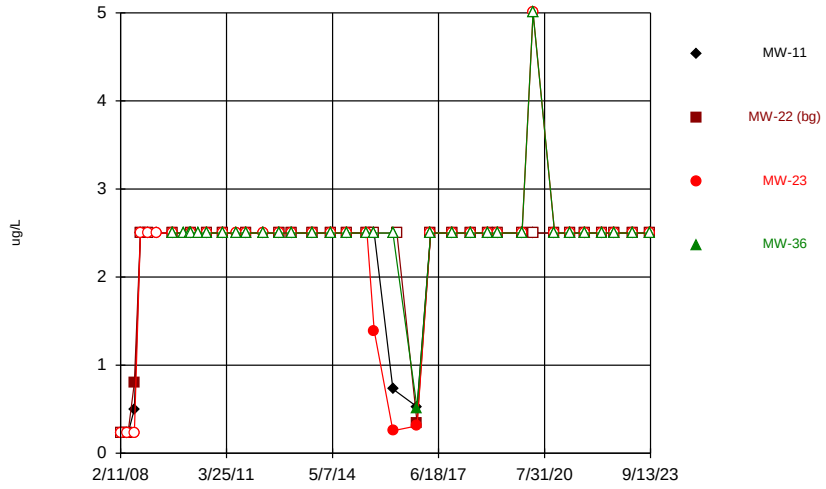
Time Series



Constituent: Lead Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

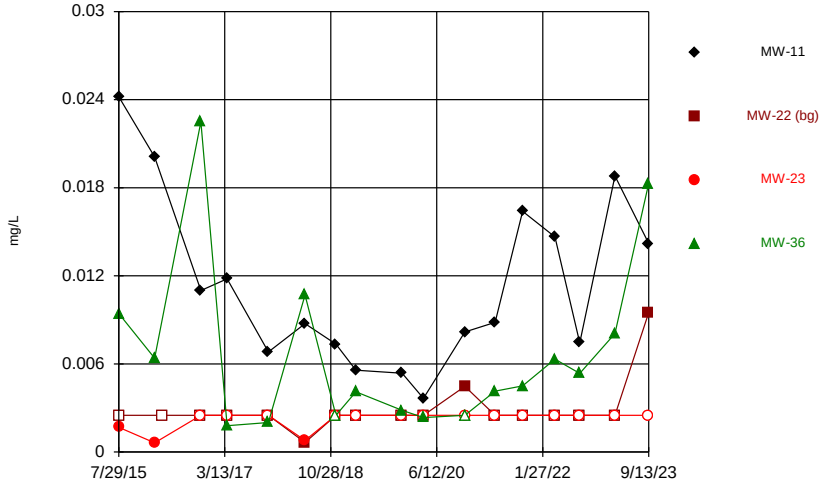
Time Series



Constituent: Methylene Chloride Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

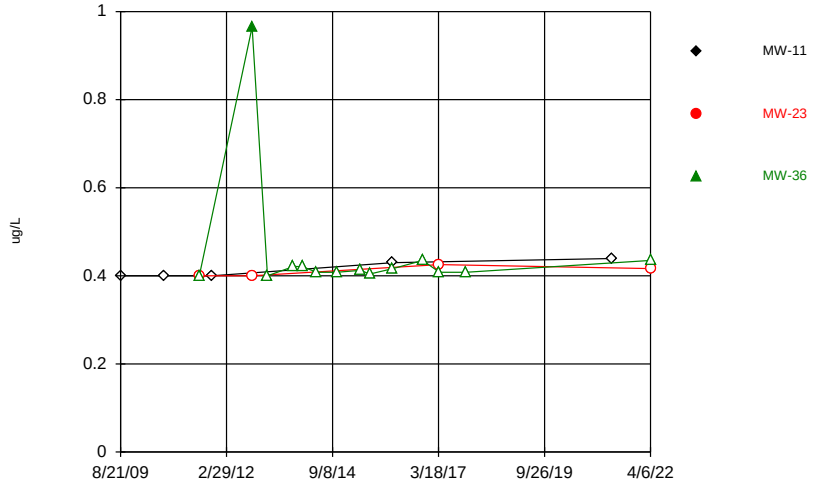
Time Series



Constituent: Nickel Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

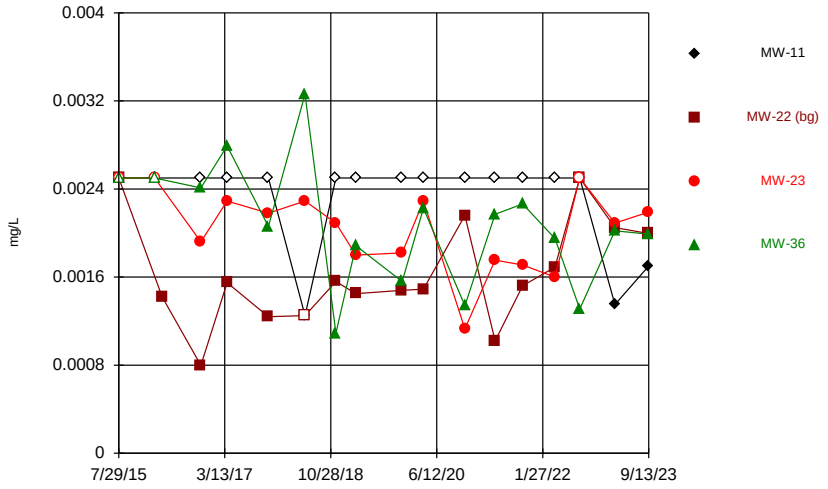
Time Series



Constituent: PCB-1260 Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

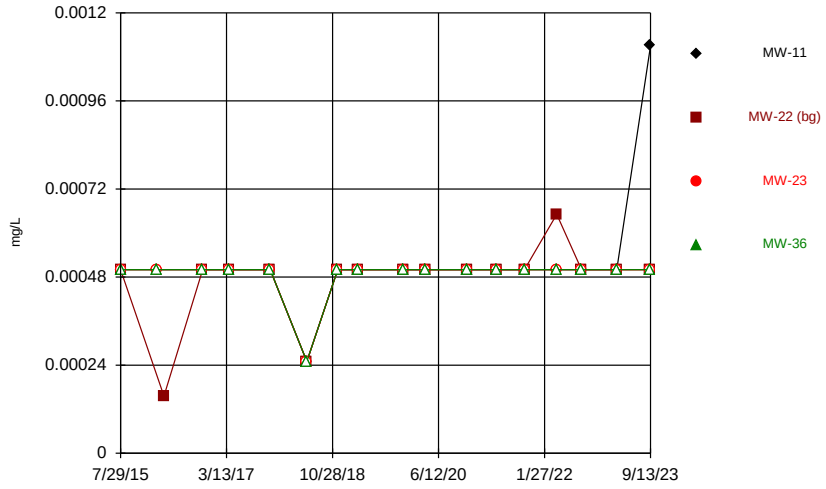
Time Series



Constituent: Selenium Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

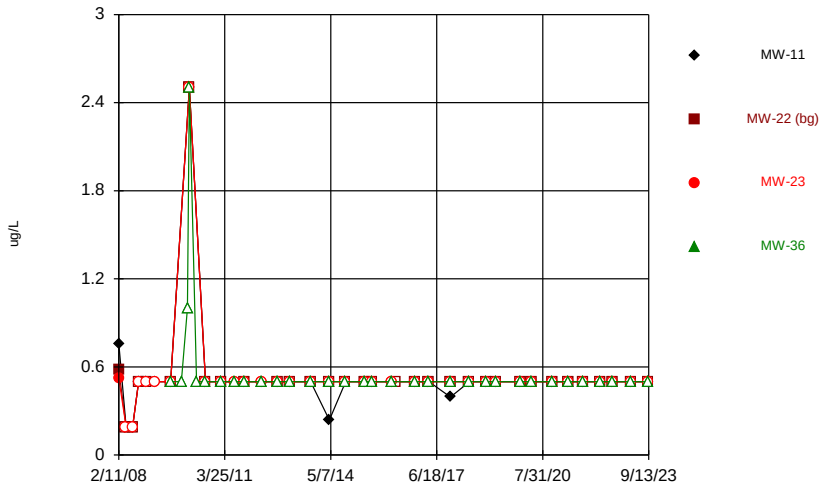
Time Series



Constituent: Silver Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

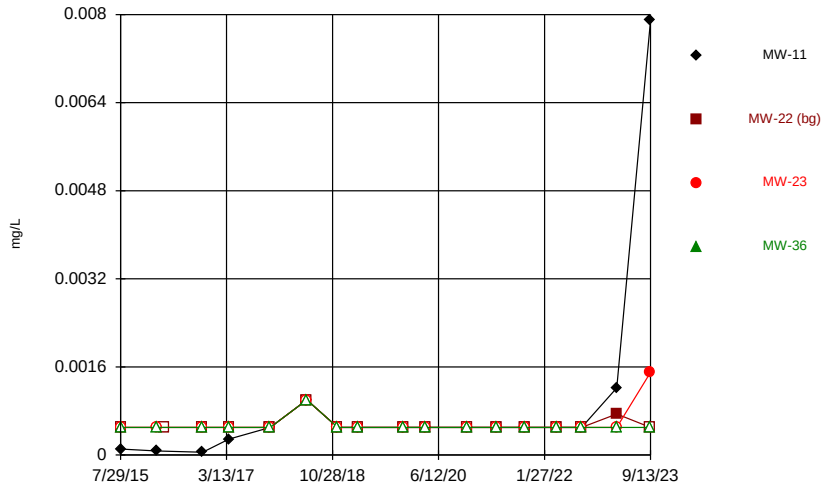
Time Series



Constituent: Tetrachloroethene Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

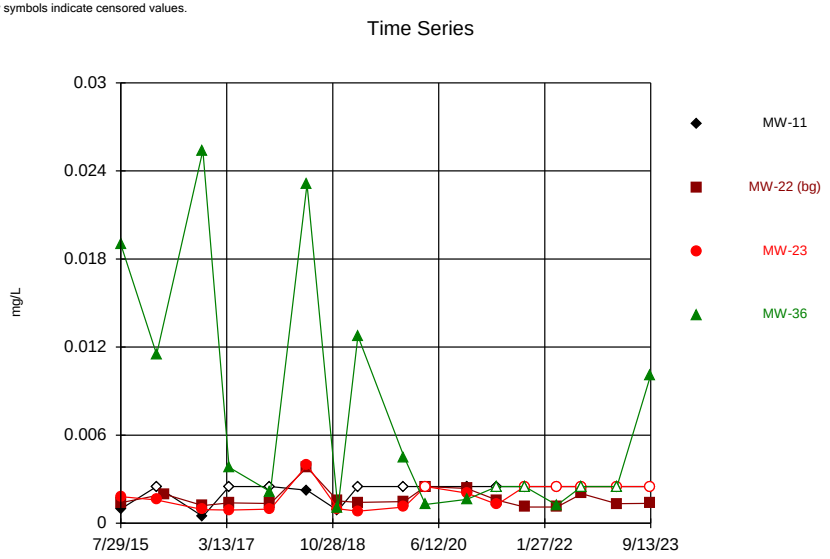
Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



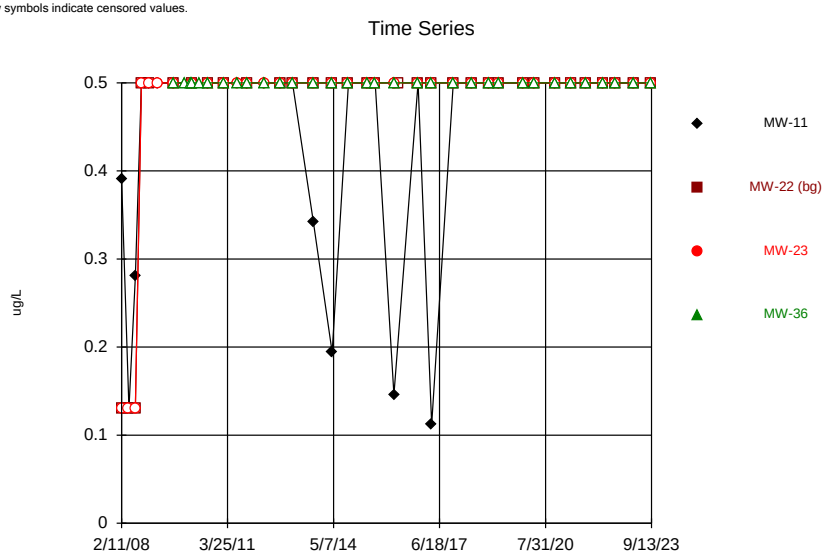
Constituent: Thallium Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



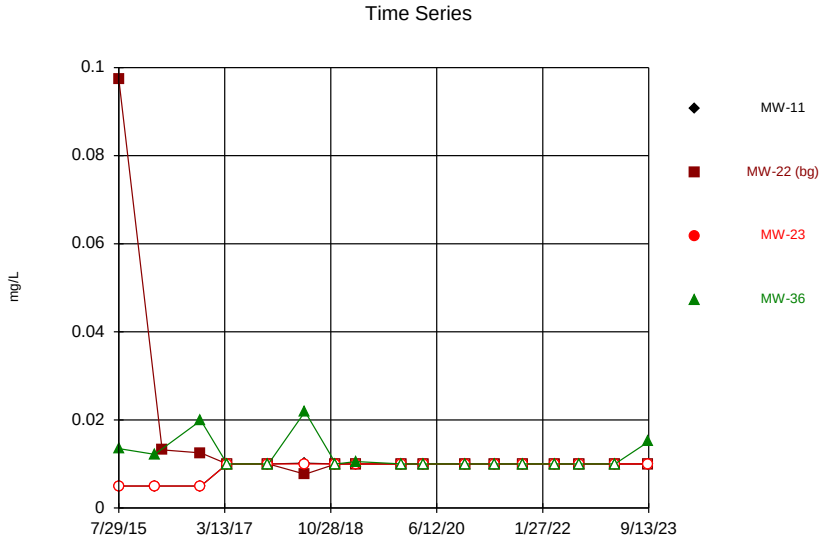
Constituent: Vanadium Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Vinyl Chloride Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Zinc Analysis Run 10/18/2023 10:31 AM View: 2023AWQR - TimeSeries
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Outlier Test Summary Table and Graphs – Water Table

Outlier Analysis

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 10/18/2023, 3:49 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Normality Test
Antimony (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	17	0.0007591	0.0003946	n/a
Arsenic (mg/L)	**MW-15R (bg)**	**Yes**	**0.00284**	**10/7/2021**	**Dixon/OH**	**0.01**	**17**	**0.001084**	**0.0005236**	**ShapiroWilk**
Barium (mg/L)	MW-15R (bg)	No	n/a	n/a	EPA/OH	0.05	17	0.2182	0.03826	ShapiroWilk
Cadmium (mg/L)	**MW-15R (bg)**	**Yes**	**0.00025,0.00025,0.00025,0.00025**	**2/15/2016,6/6/2018,11/27/2018,3/18/2019**	**OH**	**NaN**	**17**	**0.0001082**	**0.00008629**	**n/a**
Chromium (mg/L)	MW-15R (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	17	0.002128	0.000944	ShapiroWilk
Cobalt (mg/L)	**MW-15R (bg)**	**Yes**	**0.00007,0.000152,0.0005,0.00102,0.000464**	**7/29/2015,2/15/2016,6/6/2018,11/27/2018,4/6/2022**	**NP (nrm)/OH**	**NaN**	**17**	**0.0003075**	**0.0002079**	**ShapiroWilk**
Copper (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	17	0.002232	0.0005973	n/a
Lead (mg/L)	**MW-15R (bg)**	**Yes**	**0.000518**	**11/13/2017**	**OH**	**NaN**	**17**	**0.0002658**	**0.000065**	**n/a**
Nickel (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	17	0.002296	0.0005478	n/a
Selenium (mg/L)	MW-15R (bg)	No	n/a	n/a	NP (nrm)/OH	NaN	17	0.001769	0.0006036	ShapiroWilk
Vanadium (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	17	0.002182	0.0008444	n/a
Zinc (mg/L)	MW-15R (bg)	No	n/a	n/a	OH	NaN	17	0.009165	0.001997	n/a

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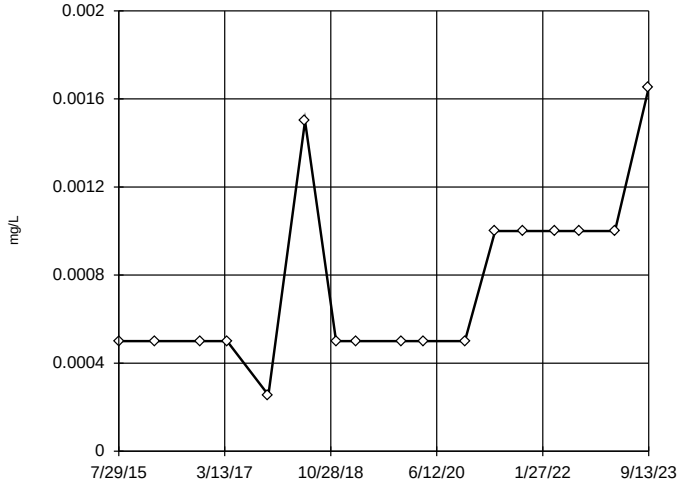
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No statistical outliers.

Constituent: Antimony Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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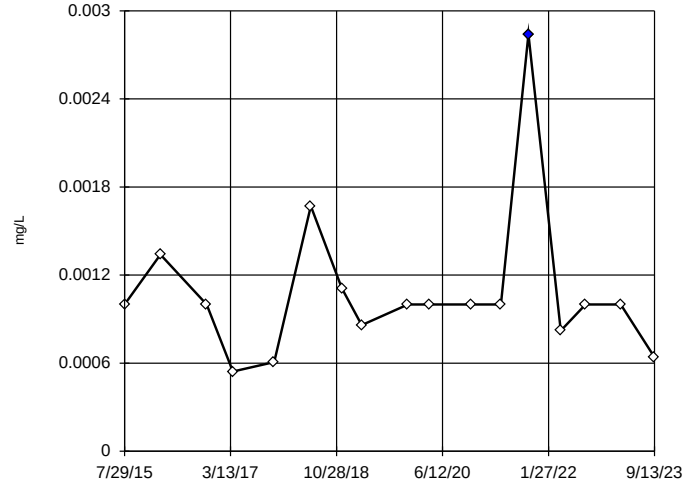
Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.001084.
Std. Dev. = 0.0005236.
0.00284: c = 0.6818
tabl = 0.577.
Alpha = 0.01.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8726
Critical = 0.844
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Arsenic Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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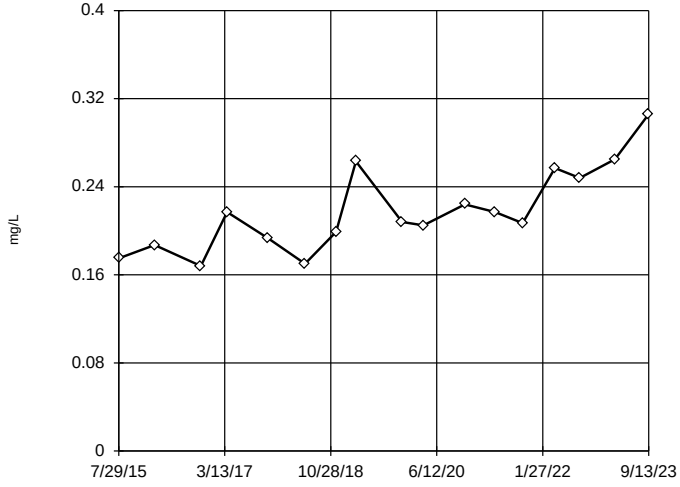
EPA Screening (suspected outliers for Dixon's Test)

MW-15R (bg)



n = 17

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.2182, std. dev. 0.03826, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9388
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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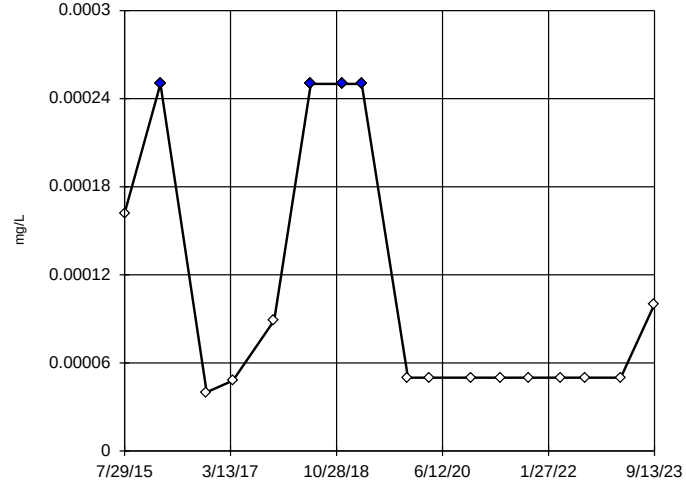
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

Statistical outliers are drawn as solid.
Outliers per Ohio method.

Constituent: Cadmium Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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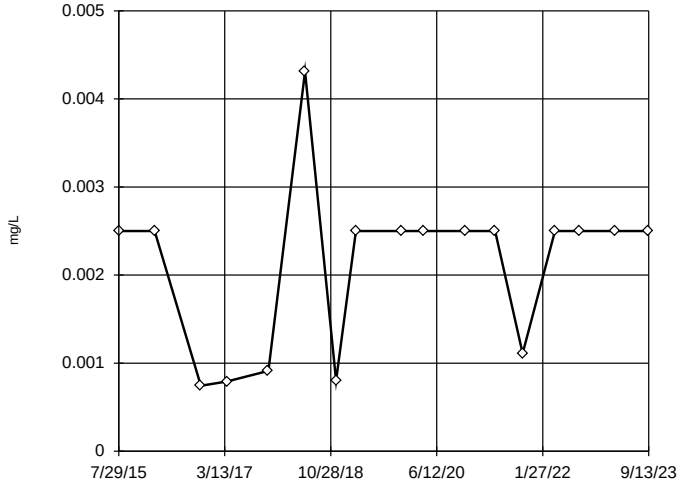
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.006967, low cutoff = -0.003456, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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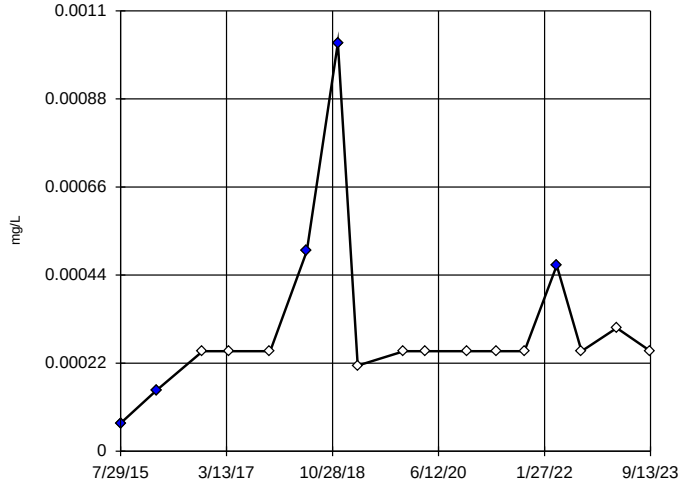
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.000366, low cutoff = 0.000163, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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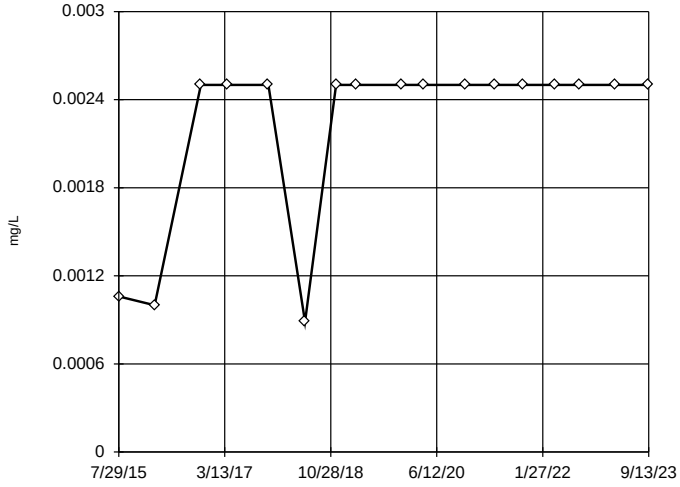
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No statistical outliers.

Constituent: Copper Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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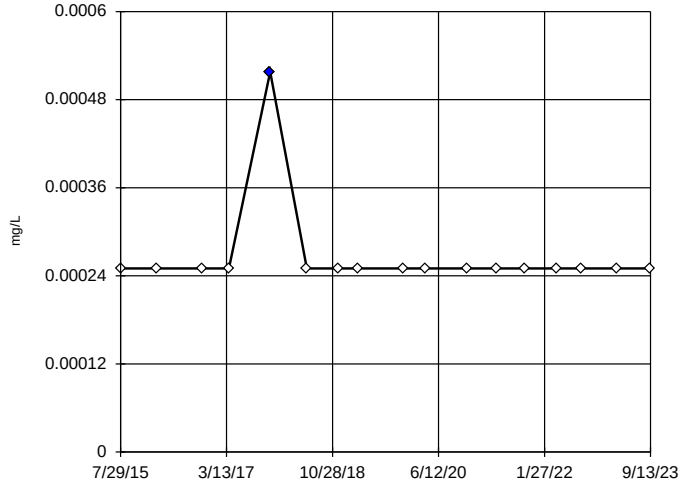
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Lead Analysis Run 10/18/2023 3:46 PM View: 2023AWQR - BG Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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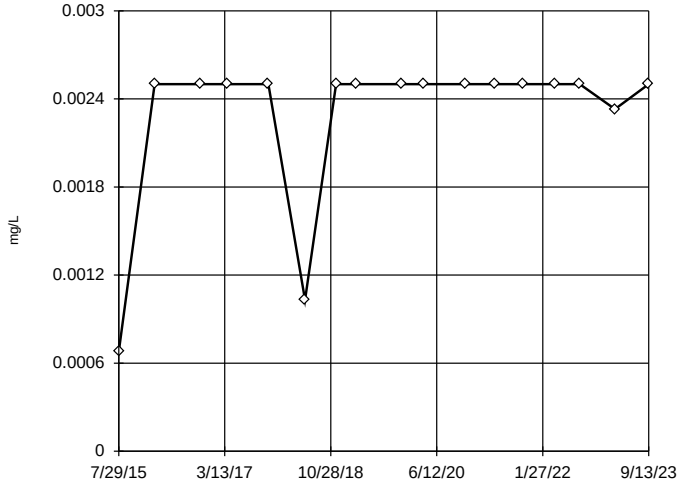
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No statistical outliers.

Constituent: Nickel Analysis Run 10/18/2023 3:47 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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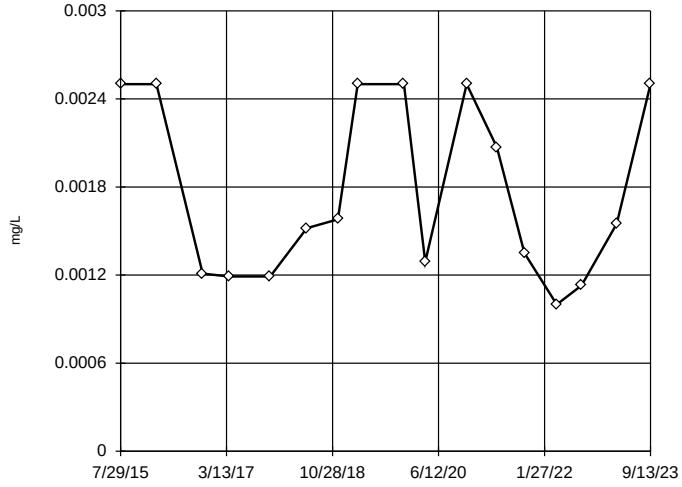
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.0064, low cutoff = -0.0027, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 10/18/2023 3:47 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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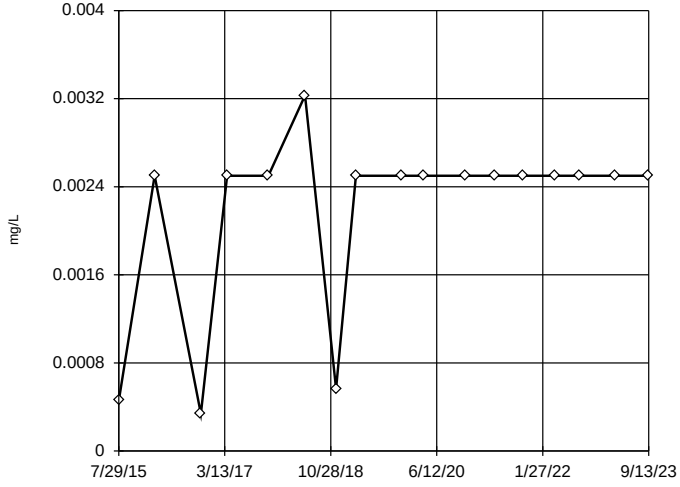
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No statistical outliers.

Constituent: Vanadium Analysis Run 10/18/2023 3:47 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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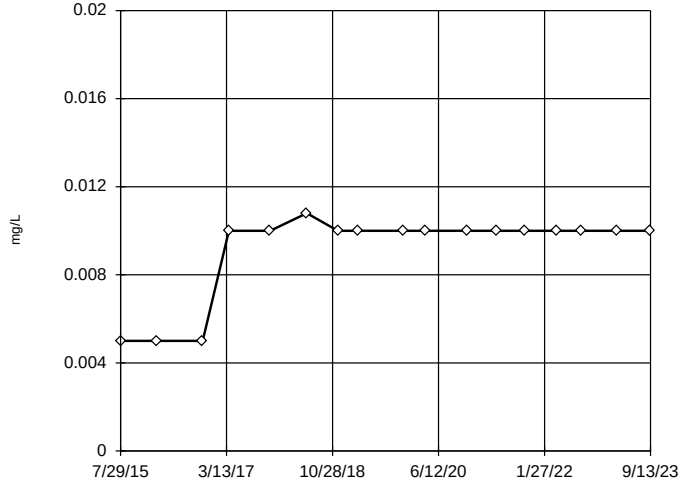
Ohio EPA 0715 Outlier Algorithm

MW-15R (bg)



n = 17

No statistical outliers.

Constituent: Zinc Analysis Run 10/18/2023 3:47 PM View: 2023AWQR - BG Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Outlier Analysis

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 10/18/2023, 4:29 PM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Normality Test
Antimony (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.001579	0.0008658	ShapiroWilk
Arsenic (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.00348	0.002349	ShapiroWilk
Barium (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.574	0.2737	ShapiroWilk
Cadmium (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.0001721	0.00009507	ShapiroWilk
Chromium (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.005288	0.003247	ShapiroWilk
Cobalt (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.009419	0.007703	ShapiroWilk
Copper (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.006164	0.005286	ShapiroWilk
Lead (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.0009396	0.000637	ShapiroWilk
Nickel (mg/L)	UD-0	No	n/a	n/a	EPA/OH	0.05	5	0.07274	0.03059	ShapiroWilk
Selenium (mg/L)	UD-0	No	n/a	n/a	NP (nrm)/OH	NaN	5	0.00226	0.0004574	ShapiroWilk
Thallium (mg/L)	**UD-0**	**Yes**	**0.001**	**10/14/2014**	**OH**	**NaN**	**5**	**0.0005172**	**0.000324**	**n/a**
Vanadium (mg/L)	**UD-0**	**Yes**	**0.025**	**10/14/2014**	**Dixon/OH**	**0.01**	**5**	**0.007094**	**0.01003**	**ShapiroWilk**

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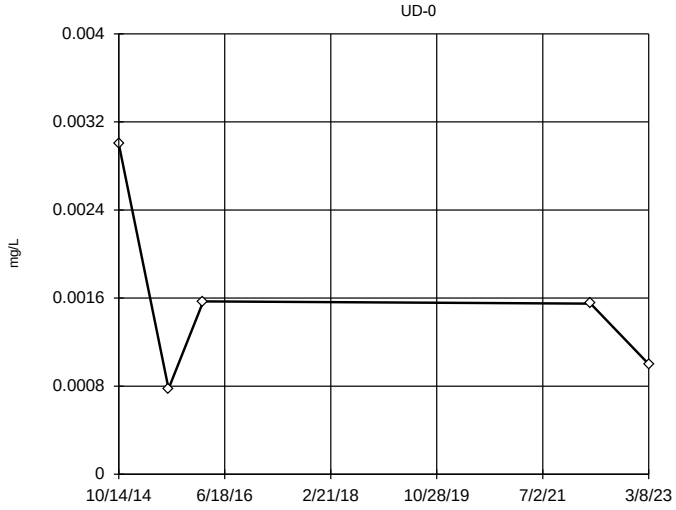
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.001579, std. dev. 0.0008658, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8698
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Antimony Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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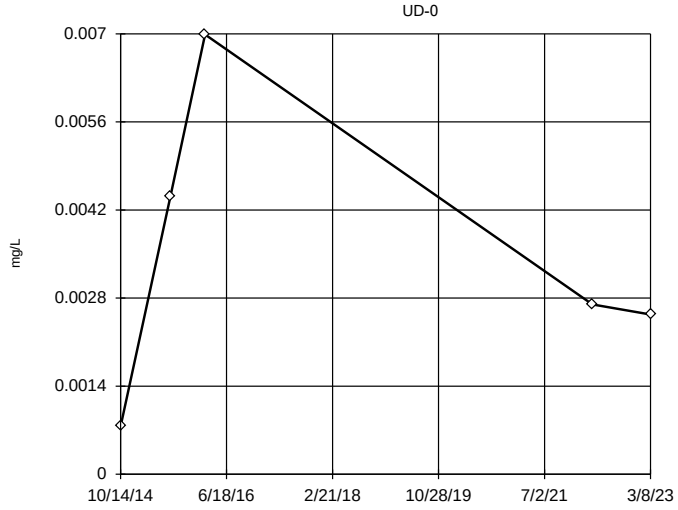
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.00348, std. dev. 0.002349, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.955
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Arsenic Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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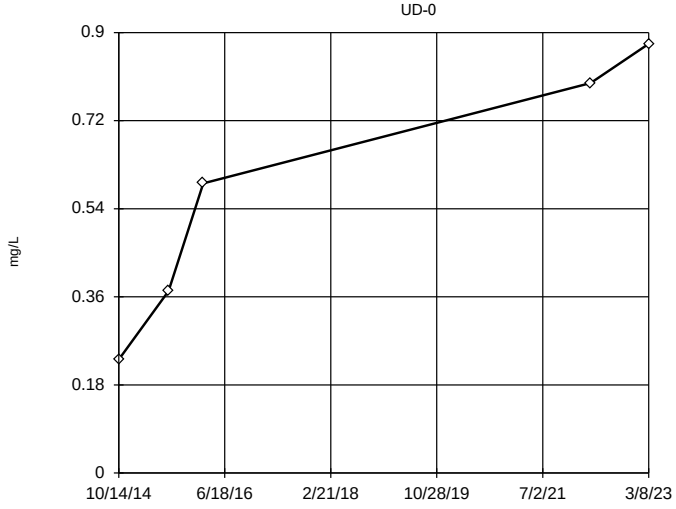
EPA Screening (suspected outliers for Dixon's Test)



n = 5

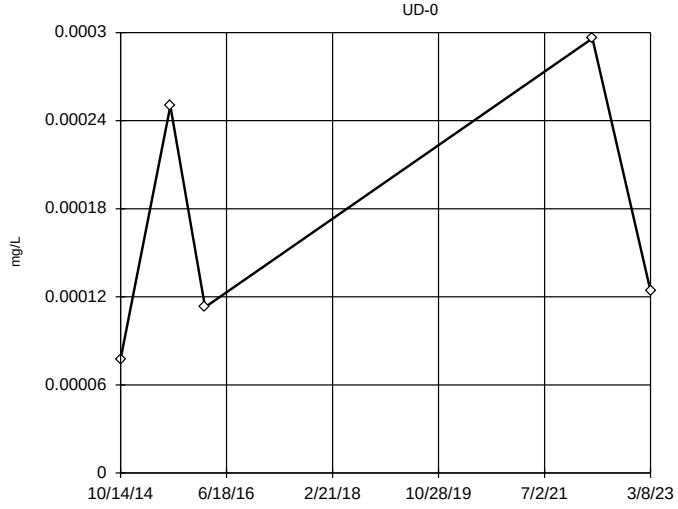
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.574, std. dev. 0.2737, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9418
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.0001721, std. dev. 0.00009507, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8783
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Cadmium Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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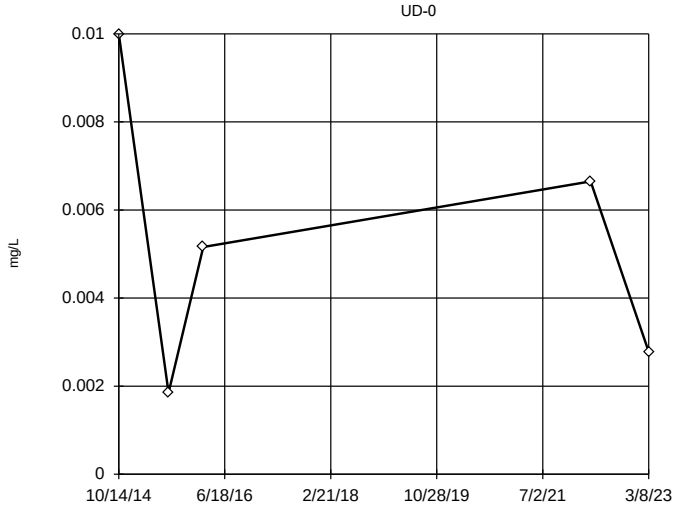
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.005288, std. dev. 0.003247, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.956
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Chromium Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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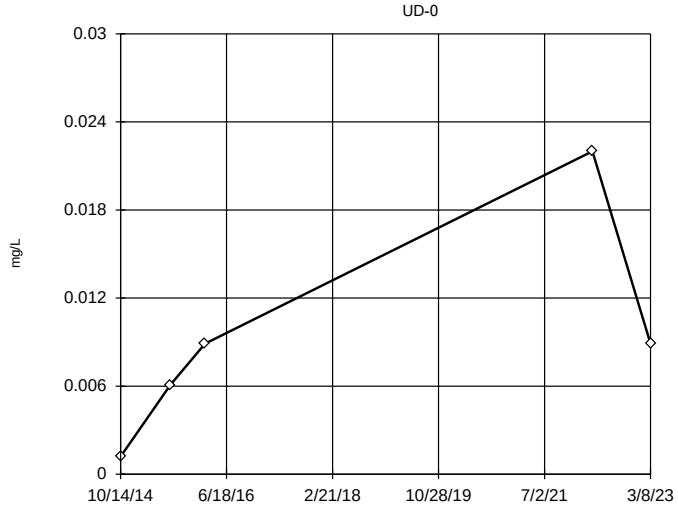
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.009419, std. dev. 0.007703, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8855
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Cobalt Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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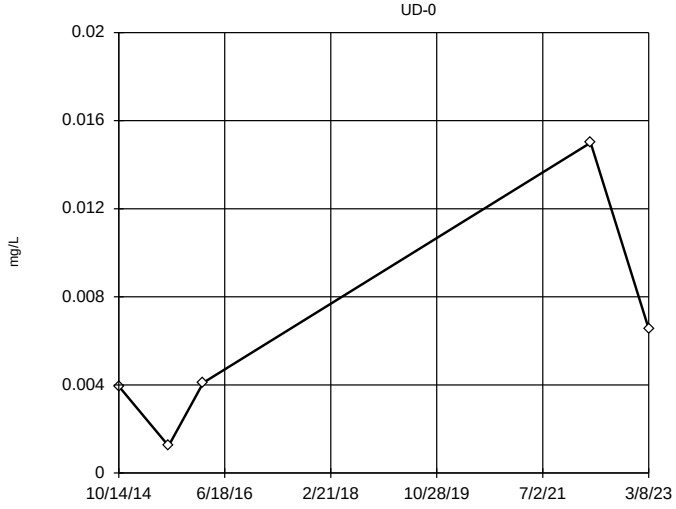
EPA Screening (suspected outliers for Dixon's Test)



n = 5

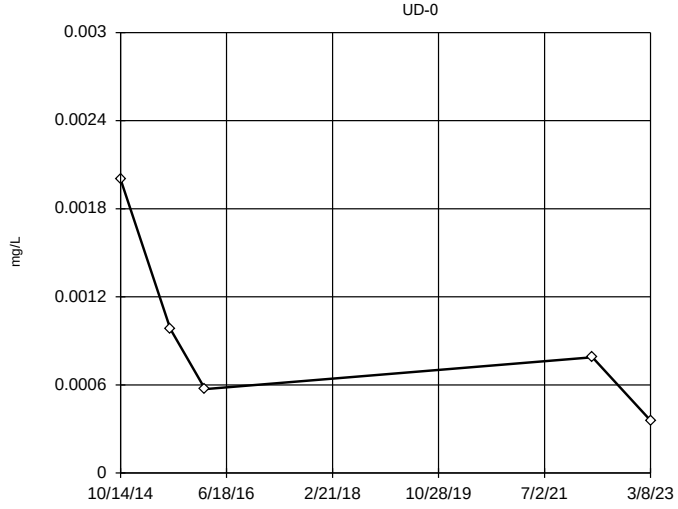
Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.006164, std. dev. 0.005286, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.856
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Copper Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.0009396, std. dev. 0.000637, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8727
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Lead Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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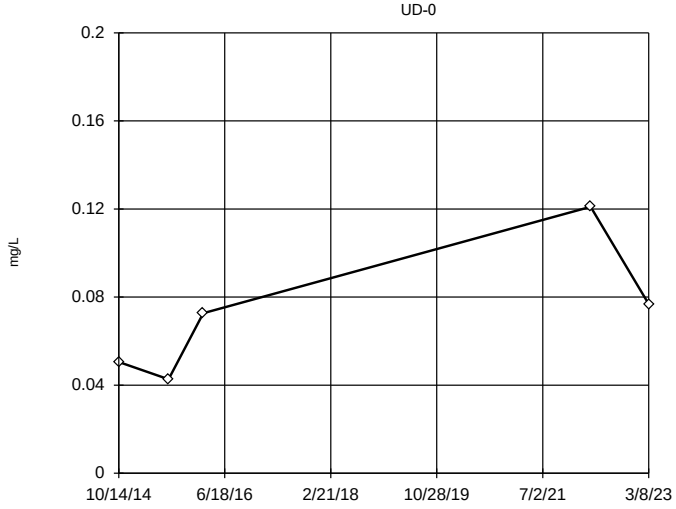
EPA Screening (suspected outliers for Dixon's Test)



n = 5

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.07274, std. dev. 0.03059, critical Tn 1.672

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9108
Critical = 0.686
The distribution was found to be normally distributed.

Constituent: Nickel Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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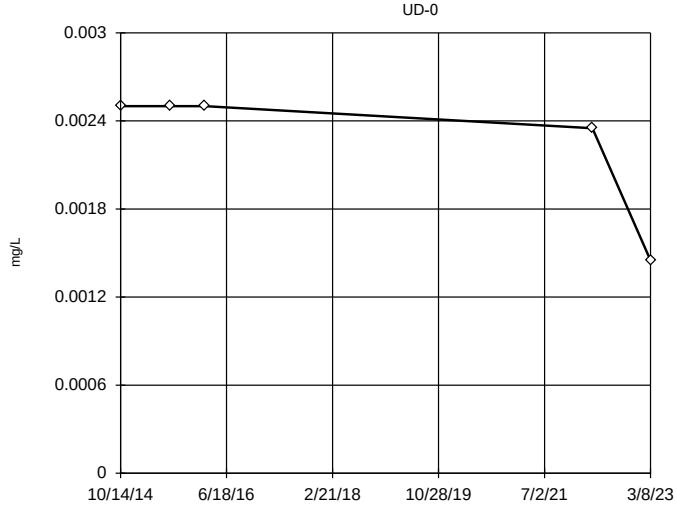
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm



n = 5

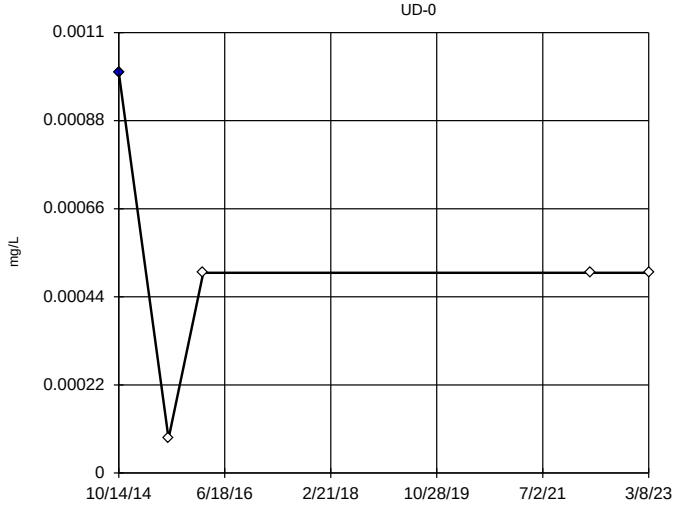
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.0043, low cutoff = 0.0001, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm



n = 5

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Thallium Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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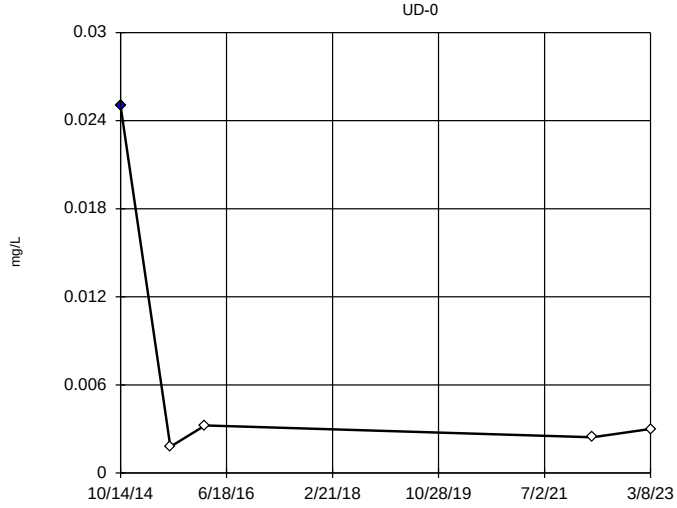
Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm



n = 5

Statistical outlier is drawn as solid.
Testing for 1 high outlier.
Mean = 0.007094.
Std. Dev. = 0.01003.
<0.05: c = 0.9375
tabl = 0.78.
Alpha = 0.01.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.951
Critical = 0.687
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Vanadium Analysis Run 10/18/2023 4:24 PM View: 2023AWQR - Outliers UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Outlier Test Summary Table and Graphs – Dakota Sandstone

Outlier Analysis

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS Printed 10/18/2023, 10:44 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Normality Test
Antimony (mg/L)	MW-22 (bg)	No	n/a	n/a	EPA/OH	0.05	16	0.001548	0.001834	ShapiroWilk
Arsenic (mg/L)	**MW-22 (bg)**	**Yes**	**0.00157,0.000659,0.00135,0.000577**	**3/28/2016,11/13/2017,6/6/2018,11/26/2018**	**NP (nrm)/OH**	**NaN**	**17**	**0.0009843**	**0.0002282**	**ShapiroWilk**
Barium (mg/L)	MW-22 (bg)	No	n/a	n/a	EPA/OH	0.05	17	0.2535	0.02206	ShapiroWilk
Beryllium (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	17	0.0004755	0.0001011	n/a
Cadmium (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	17	0.0001569	0.00009888	n/a
Chromium (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	17	0.002434	0.0004925	n/a
Cobalt (mg/L)	**MW-22 (bg)**	**Yes**	**0.00138**	**11/17/2020**	**OH**	**NaN**	**17**	**0.0003206**	**0.0002838**	**n/a**
Copper (mg/L)	**MW-22 (bg)**	**Yes**	**0.0164**	**7/29/2015**	**OH**	**NaN**	**17**	**0.003385**	**0.003381**	**n/a**
Lead (mg/L)	**MW-22 (bg)**	**Yes**	**0.000765**	**3/28/2016**	**NP (nrm)/OH**	**NaN**	**17**	**0.0003159**	**0.0001381**	**ShapiroWilk**
Nickel (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	17	0.002919	0.001826	n/a
Selenium (mg/L)	MW-22 (bg)	No	n/a	n/a	EPA/OH	0.05	17	0.001628	0.000475	ShapiroWilk
Silver (mg/L)	MW-22 (bg)	No	n/a	n/a	OH	NaN	17	0.0004739	0.0001096	n/a
Thallium (mg/L)	**MW-22 (bg)**	**Yes**	**0.001**	**6/6/2018**	**OH**	**NaN**	**17**	**0.0005439**	**0.0001318**	**n/a**
Vanadium (mg/L)	MW-22 (bg)	No	n/a	n/a	Dixon/OH	0.01	17	0.001699	0.0006794	ShapiroWilk
Zinc (mg/L)	**MW-22 (bg)**	**Yes**	**0.0974**	**7/29/2015**	**OH**	**NaN**	**17**	**0.01534**	**0.02118**	**n/a**

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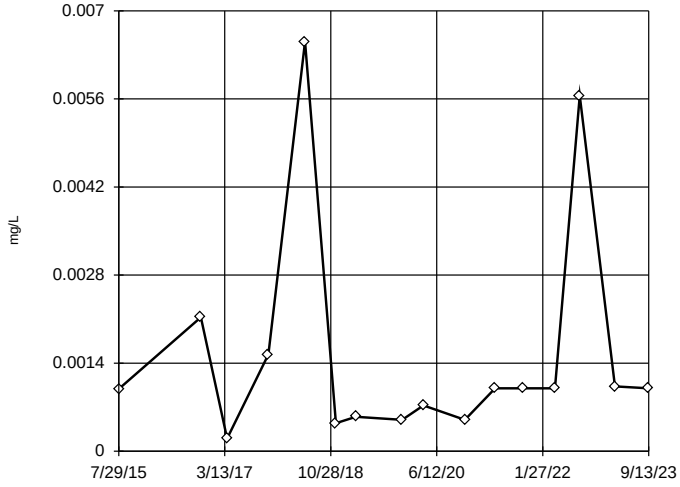
EPA Screening (suspected outliers for Dixon's Test)

MW-22 (bg)



n = 16

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.001548, std. dev. 0.001834, critical Tn 2.443

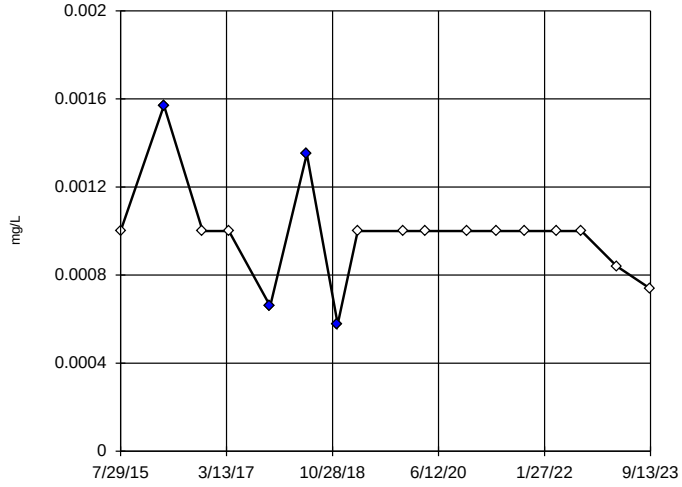
Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9143
Critical = 0.844 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Antimony Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.00124, low cutoff = 0.00068, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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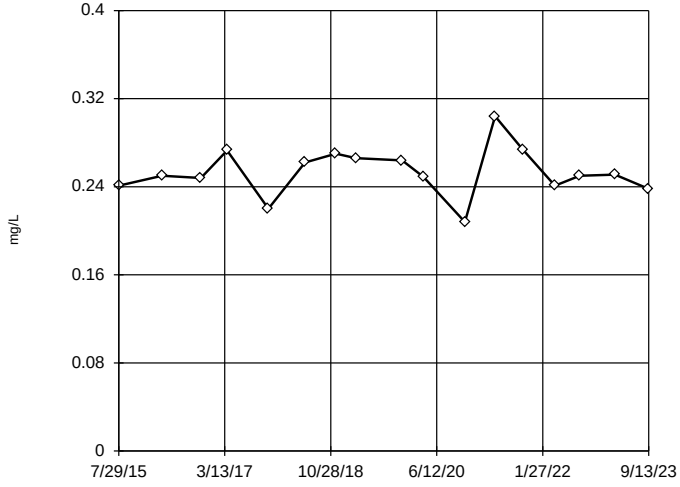
EPA Screening (suspected outliers for Dixon's Test)

MW-22 (bg)



n = 17

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Ohio method in use.
Mean 0.2535, std. dev. 0.02206, critical Tn 2.475

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.9626
Critical = 0.851
The distribution was found to be normally distributed.

Constituent: Barium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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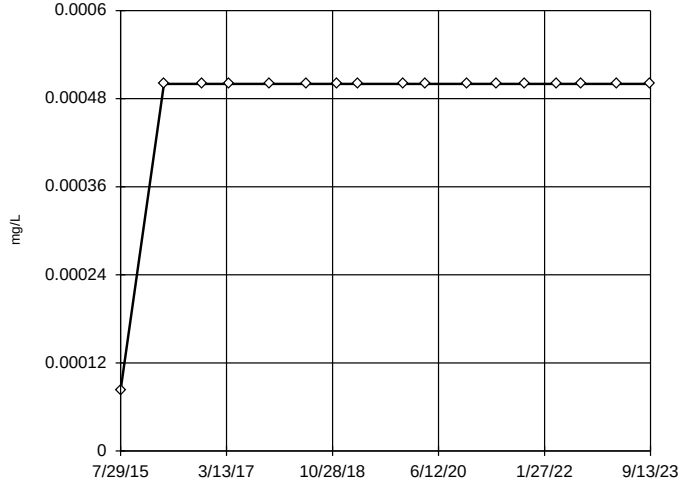
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

No statistical outliers.

Constituent: Beryllium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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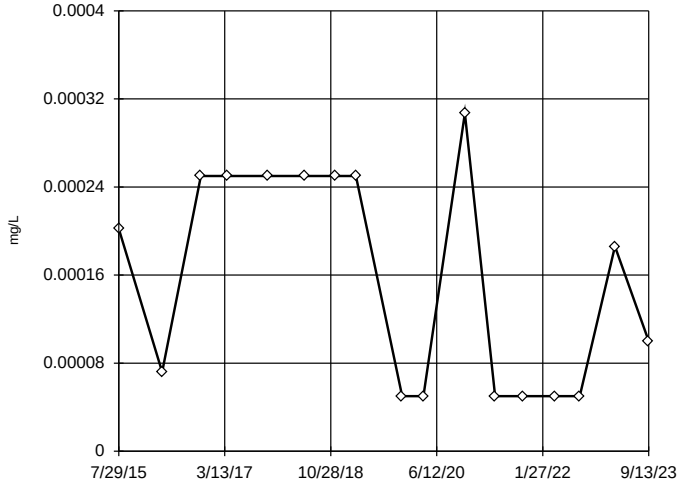
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

No statistical outliers.

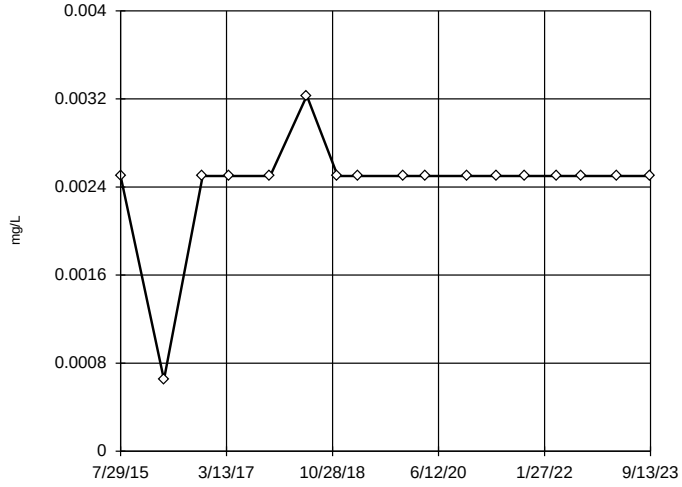
Constituent: Cadmium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

No statistical outliers.

Constituent: Chromium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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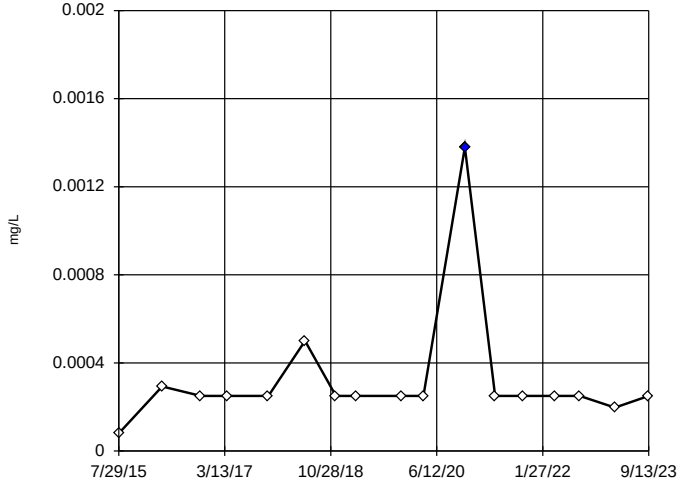
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Cobalt Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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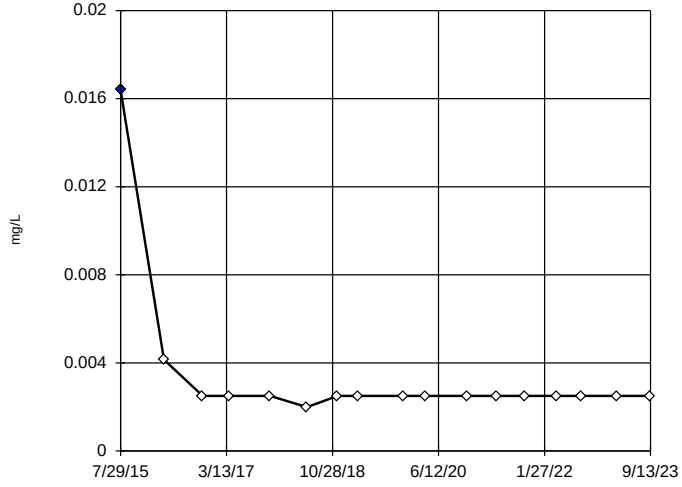
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Copper Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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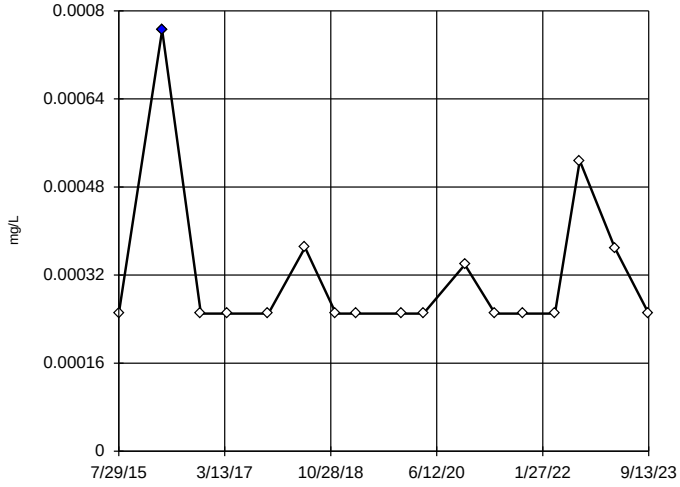
Tukey's Outlier Screening / Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.01 alpha level.

High cutoff = 0.000666, low cutoff = -0.000062, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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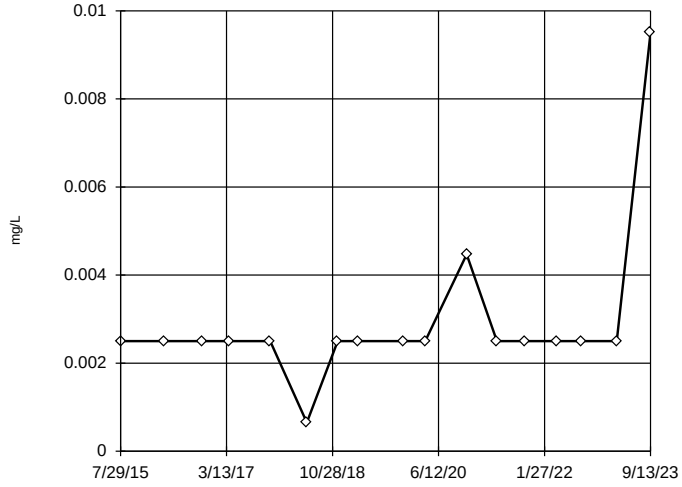
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

No statistical outliers.

Constituent: Nickel Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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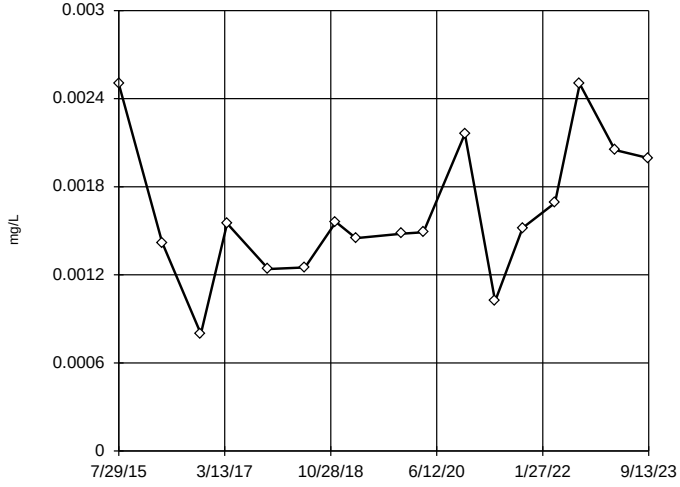
EPA Screening (suspected outliers for Dixon's Test)

MW-22 (bg)



n = 17

Dixon's will not be run. No suspect values identified or unable to establish suspect values. Ohio method in use. Mean 0.001628, std. dev. 0.000475, critical Tn 2.475

Normality test used: Shapiro Wilk@alpha = 0.01 Calculated = 0.9426 Critical = 0.851 The distribution was found to be normally distributed.

Constituent: Selenium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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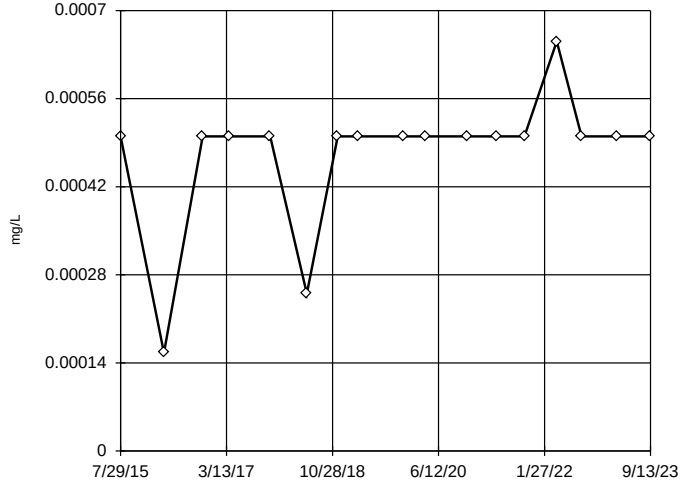
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

No statistical outliers.

Constituent: Silver Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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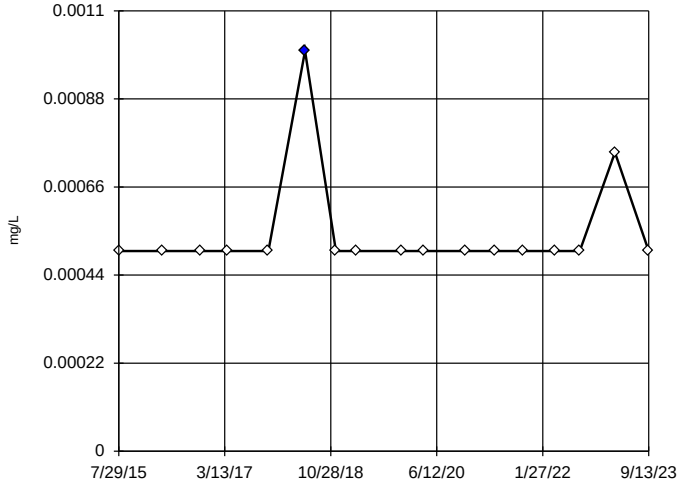
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Thallium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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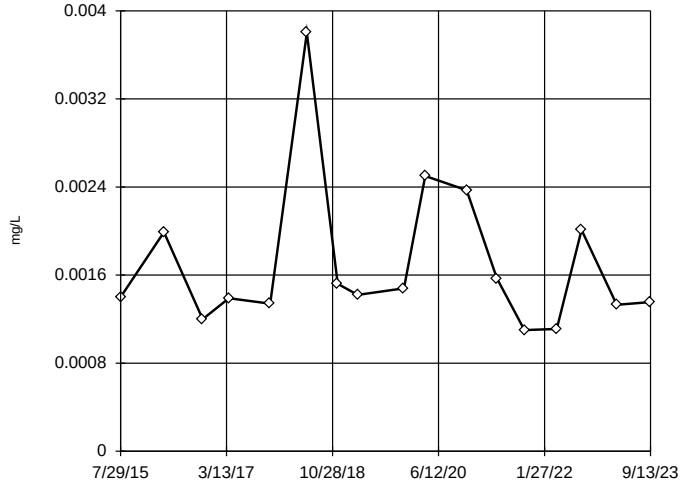
Dixon's Outlier Test / Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

No statistical outliers.
Testing for 1 high outlier.
Mean = 0.001699.
Std. Dev. = 0.0006794.
0.0038 (J): c = 0.55
tabl = 0.577.
Alpha = 0.01.

Normality test used:
Shapiro Wilk@alpha = 0.01
Calculated = 0.8461
Critical = 0.844
The distribution was found to be normally distrib-uted.

Constituent: Vanadium Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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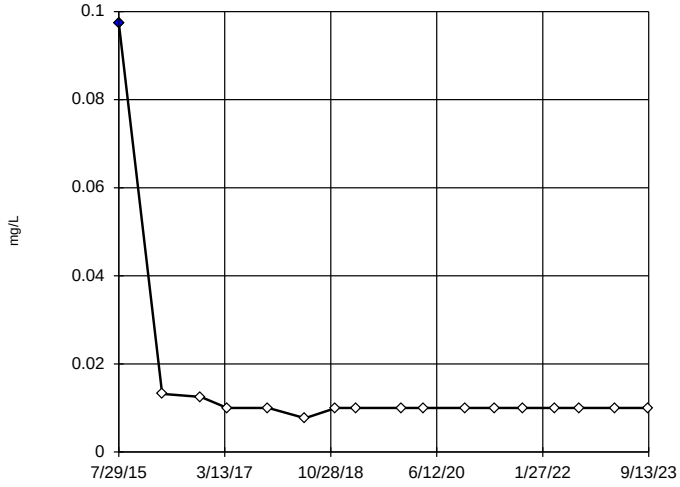
Ohio EPA 0715 Outlier Algorithm

MW-22 (bg)



n = 17

Statistical outlier is drawn as solid.
Outlier per Ohio method.

Constituent: Zinc Analysis Run 10/18/2023 10:41 AM View: 2023AWQR - Outliers

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Interwell Prediction Limits Summary Table and Graphs – Water Table

Prediction Limit

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 10/18/2023, 4:10 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Trans...	Alpha	Method
Arsenic (mg/L)	MW-43	0.002941	n/a	9/13/2023	0.00242	No	17	47.06	ln(x)	0.0004877	Param Inter 1 of 2
Barium (mg/L)	**MW-19**	**0.3136**	**n/a**	**9/13/2023**	**1.24**	**Yes**	**17**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	**MW-21**	**0.3136**	**n/a**	**9/13/2023**	**1.24**	**Yes**	**17**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	**MW-37R**	**0.3136**	**n/a**	**9/13/2023**	**0.693**	**Yes**	**17**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	MW-38R	0.3136	n/a	9/13/2023	0.212	No	17	0	No	0.0004877	Param Inter 1 of 2
Barium (mg/L)	MW-39	0.3136	n/a	9/13/2023	0.0893	No	17	0	No	0.0004877	Param Inter 1 of 2
Barium (mg/L)	**MW-24**	**0.3136**	**n/a**	**9/13/2023**	**0.712**	**Yes**	**17**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Barium (mg/L)	**MW-43**	**0.3136**	**n/a**	**9/13/2023**	**0.348**	**Yes**	**17**	**0**	**No**	**0.0004877**	**Param Inter 1 of 2**
Cadmium (mg/L)	MW-37R	0.00025	n/a	9/13/2023	0.000205	No	17	76.47	n/a	0.005034	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	MW-39	0.00025	n/a	9/13/2023	0.0002095	No	17	76.47	n/a	0.005034	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	**MW-24**	**0.00025**	**n/a**	**9/13/2023**	**0.000776**	**Yes**	**17**	**76.47**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Cadmium (mg/L)	MW-43	0.00025	n/a	9/13/2023	0.00024	No	17	76.47	n/a	0.005034	NP Inter (NDs) 1 of 2
Cobalt (mg/L)	**MW-19**	**0.00102**	**n/a**	**9/13/2023**	**0.0238**	**Yes**	**17**	**64.71**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-21**	**0.00102**	**n/a**	**9/13/2023**	**0.00468**	**Yes**	**17**	**64.71**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-37R**	**0.00102**	**n/a**	**9/13/2023**	**0.00121**	**Yes**	**17**	**64.71**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-24**	**0.00102**	**n/a**	**9/13/2023**	**0.00323**	**Yes**	**17**	**64.71**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-43**	**0.00102**	**n/a**	**9/13/2023**	**0.013**	**Yes**	**17**	**64.71**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Lead (mg/L)	**MW-37R**	**0.000518**	**n/a**	**9/13/2023**	**0.00135**	**Yes**	**17**	**94.12**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Lead (mg/L)	MW-39	0.000518	n/a	9/13/2023	0.0004855	No	17	94.12	n/a	0.005034	NP Inter (NDs) 1 of 2
Nickel (mg/L)	**MW-19**	**0.0025**	**n/a**	**9/13/2023**	**0.0431**	**Yes**	**17**	**82.35**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-37R**	**0.0025**	**n/a**	**9/13/2023**	**0.0127**	**Yes**	**17**	**82.35**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-24**	**0.0025**	**n/a**	**9/13/2023**	**0.0239**	**Yes**	**17**	**82.35**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-43**	**0.0025**	**n/a**	**9/13/2023**	**0.0059**	**Yes**	**17**	**82.35**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Selenium (mg/L)	**MW-37R**	**0.0025**	**n/a**	**9/13/2023**	**0.0558**	**Yes**	**17**	**35.29**	**n/a**	**0.005034**	**NP Inter (normality) 1 of 2**
Selenium (mg/L)	**MW-38R**	**0.0025**	**n/a**	**9/13/2023**	**0.0264**	**Yes**	**17**	**35.29**	**n/a**	**0.005034**	**NP Inter (normality) 1 of 2**
Selenium (mg/L)	**MW-39**	**0.0025**	**n/a**	**9/13/2023**	**0.07505**	**Yes**	**17**	**35.29**	**n/a**	**0.005034**	**NP Inter (normality) 1 of 2**
Thallium (mg/L)	**MW-39**	**0.001**	**n/a**	**9/13/2023**	**0.003065**	**Yes**	**17**	**100**	**n/a**	**0.005034**	**NP Inter (NDs) 1 of 2**
Vanadium (mg/L)	MW-39	0.00323	n/a	9/13/2023	0.00381J	No	17	76.47	n/a	0.005034	NP Inter (NDs) 1 of 2

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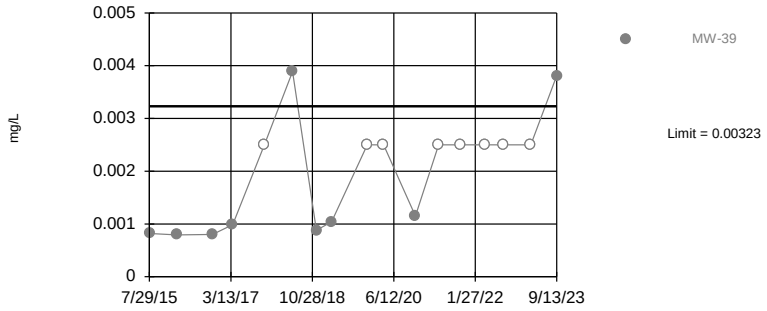
Hollow symbols indicate censored values.

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 17 background values. 76.47% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Assumes 8 future values.

Constituent: Vanadium Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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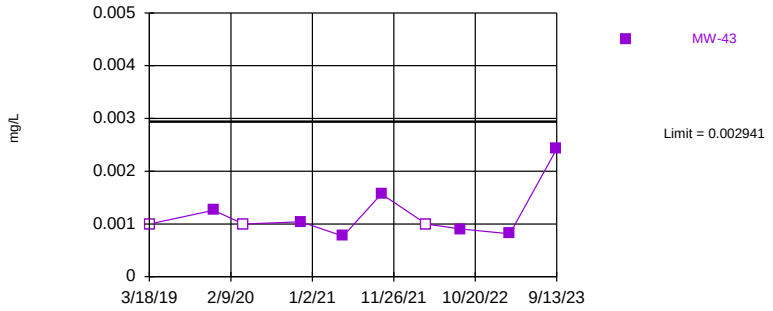
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-6.963, Std. Dev.=0.455, n=17, 47.06% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8694, critical = 0.851. Kappa = 2.493 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.00438. Individual comparison alpha = 0.0004877. Assumes 8 future values.

Constituent: Arsenic Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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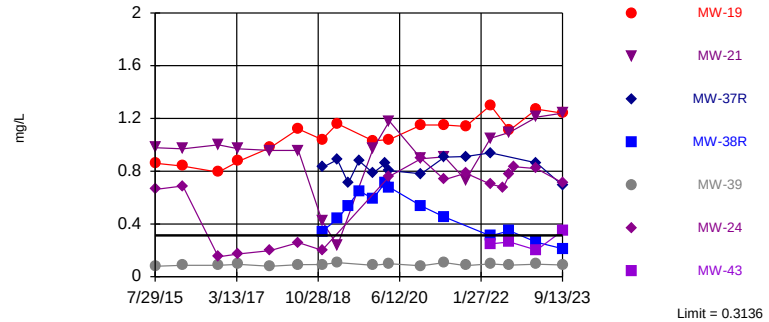
Exceeds Limit: MW-19, MW-21, MW-37R, MW-24, MW-43

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2182, Std. Dev.=0.03826, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9388, critical = 0.851. Kappa = 2.493 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.00438. Individual comparison alpha = 0.0004877. Comparing 7 points to limit. Assumes 2 future values.

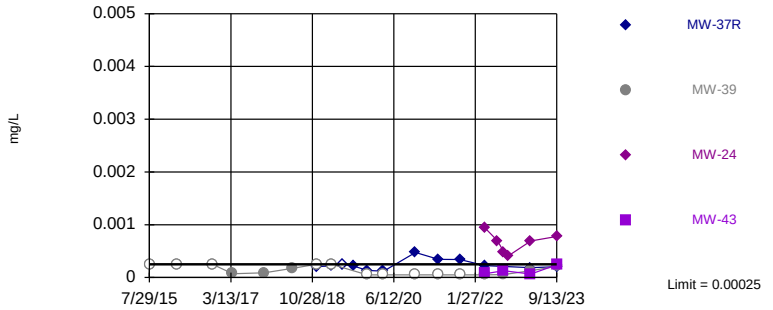
Constituent: Barium Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-24

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 76.47% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Comparing 4 points to limit. Assumes 5 future values.

Constituent: Cadmium Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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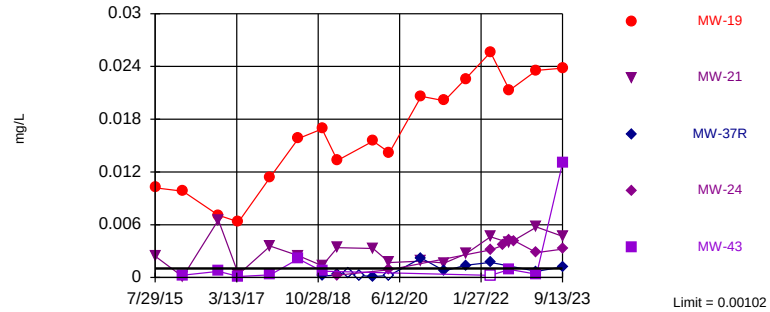
Hollow symbols indicate censored values.

Exceeds Limit: MW-19, MW-21, MW-37R, MW-24, MW-43

Prediction Limit

Interwell Non-parametric

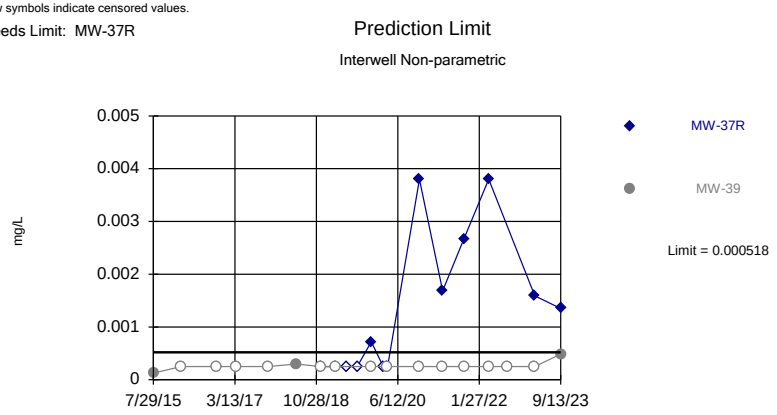


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 64.71% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Comparing 5 points to limit. Assumes 4 future values.

Constituent: Cobalt Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-37R

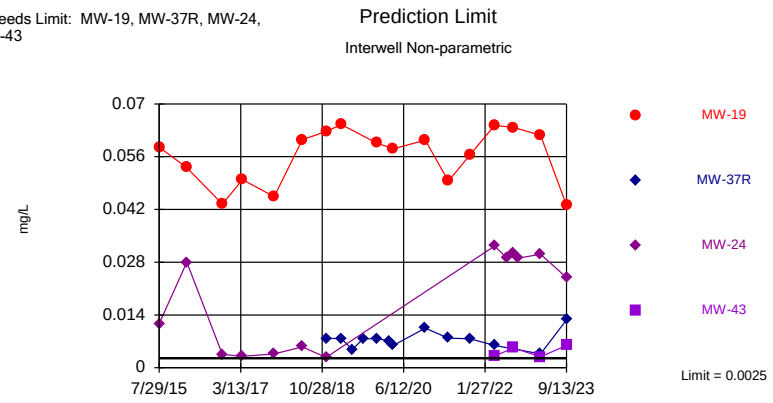


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 94.12% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Comparing 2 points to limit. Assumes 7 future values.

Constituent: Lead Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Exceeds Limit: MW-19, MW-37R, MW-24, MW-43

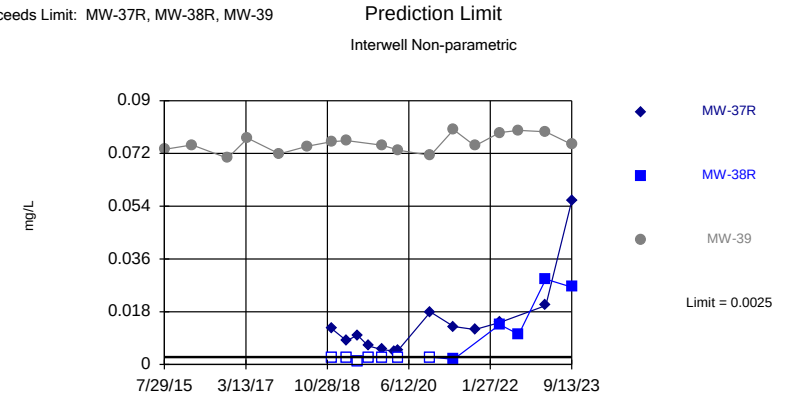


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 82.35% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Comparing 4 points to limit. Assumes 5 future values.

Constituent: Nickel Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-37R, MW-38R, MW-39

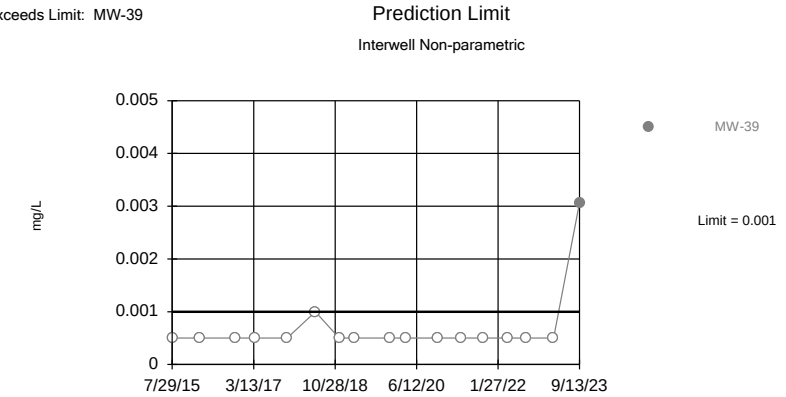


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 17 background values. 35.29% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Comparing 3 points to limit. Assumes 6 future values.

Constituent: Selenium Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-39



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 100% NDs. Annual per-constituent alpha = 0.08684. Individual comparison alpha = 0.005034 (1 of 2). Assumes 8 future values.

Constituent: Thallium Analysis Run 10/18/2023 4:06 PM View: 2023AWQR - DM and AM Interwell PL
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Interwell Prediction Limits Summary Table and Graphs – Dakota Sandstone

Prediction Limit

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS Printed 10/18/2023, 10:54 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Trans...	Alpha	Method
Arsenic (mg/L)	**MW-11**	**0.00157**	**n/a**	**9/13/2023**	**0.0145**	**Yes**	**17**	**64.71**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Barium (mg/L)	**MW-11**	**0.3021**	**n/a**	**9/13/2023**	**0.636**	**Yes**	**17**	**0**	**No**	**0.00117**	**Param Inter 1 of 2**
Barium (mg/L)	MW-23	0.3021	n/a	9/13/2023	0.146	No	17	0	No	0.00117	Param Inter 1 of 2
Barium (mg/L)	MW-36	0.3021	n/a	9/13/2023	0.135	No	17	0	No	0.00117	Param Inter 1 of 2
Cadmium (mg/L)	MW-11	0.000307	n/a	9/13/2023	0.000213	No	17	76.47	n/a	0.00563	NP Inter (NDs) 1 of 2
Cadmium (mg/L)	**MW-36**	**0.000307**	**n/a**	**9/13/2023**	**0.000656**	**Yes**	**17**	**76.47**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-11**	**0.00138**	**n/a**	**9/13/2023**	**0.0113**	**Yes**	**17**	**76.47**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Cobalt (mg/L)	**MW-36**	**0.00138**	**n/a**	**9/13/2023**	**0.00387**	**Yes**	**17**	**76.47**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Lead (mg/L)	MW-11	0.000765	n/a	9/13/2023	0.000589	No	17	70.59	n/a	0.00563	NP Inter (NDs) 1 of 2
Lead (mg/L)	**MW-36**	**0.000765**	**n/a**	**9/13/2023**	**0.00215**	**Yes**	**17**	**70.59**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-11**	**0.0095**	**n/a**	**9/13/2023**	**0.0142**	**Yes**	**17**	**82.35**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Nickel (mg/L)	**MW-36**	**0.0095**	**n/a**	**9/13/2023**	**0.0183**	**Yes**	**17**	**82.35**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Silver (mg/L)	**MW-11**	**0.000651**	**n/a**	**9/13/2023**	**0.00111**	**Yes**	**17**	**88.24**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Thallium (mg/L)	**MW-11**	**0.001**	**n/a**	**9/13/2023**	**0.00789**	**Yes**	**17**	**94.12**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Thallium (mg/L)	**MW-23**	**0.001**	**n/a**	**9/13/2023**	**0.0015**	**Yes**	**17**	**94.12**	**n/a**	**0.00563**	**NP Inter (NDs) 1 of 2**
Vanadium (mg/L)	**MW-36**	**0.003303**	**n/a**	**9/13/2023**	**0.0101**	**Yes**	**17**	**5.882**	**ln(x)**	**0.00117**	**Param Inter 1 of 2**

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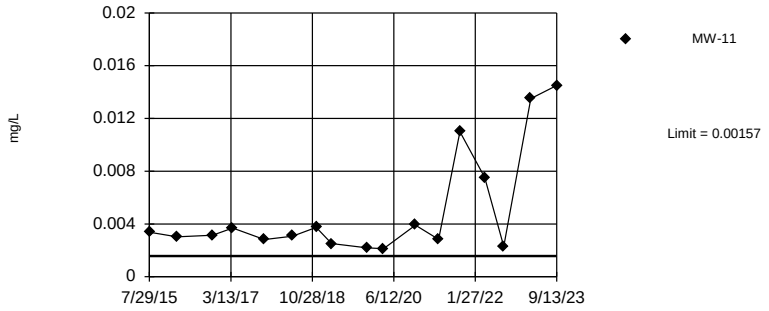
Exceeds Limit: MW-11

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 64.71% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Assumes 2 future values.

Constituent: Arsenic Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

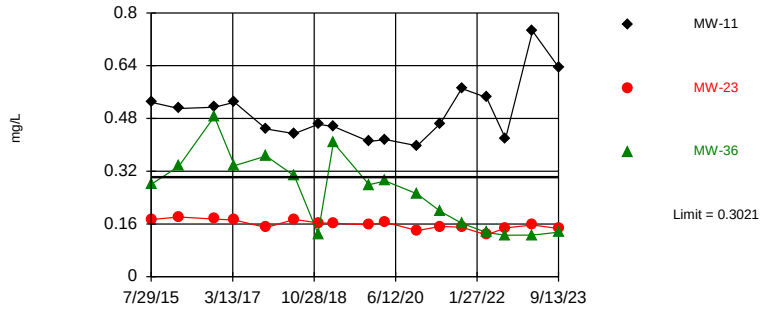
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Exceeds Limit: MW-11

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2535, Std. Dev.=0.02206, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9626, critical = 0.851. Kappa = 2.206 (c=15, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.003506. Individual comparison alpha = 0.00117. Comparing 3 points to limit.

Constituent: Barium Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

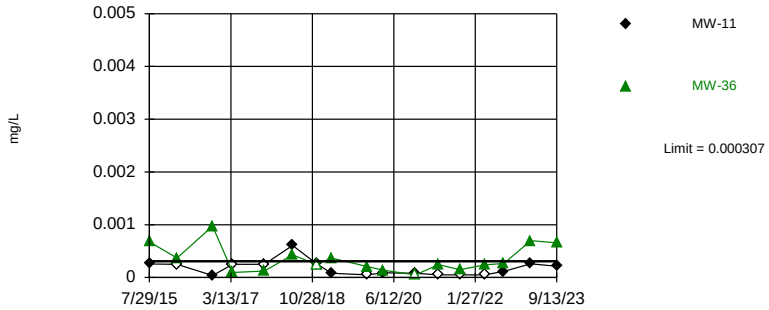
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 76.47% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Cadmium Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

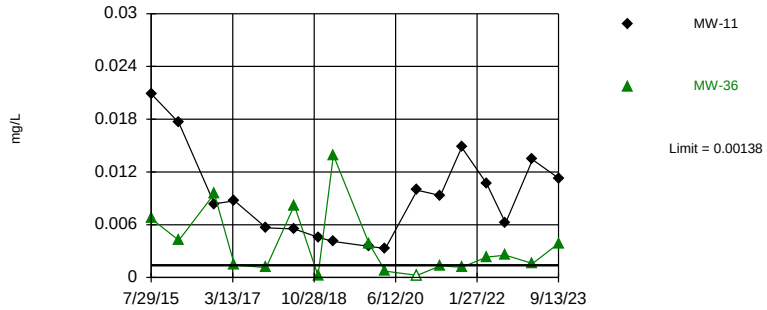
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-11, MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 76.47% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Cobalt Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

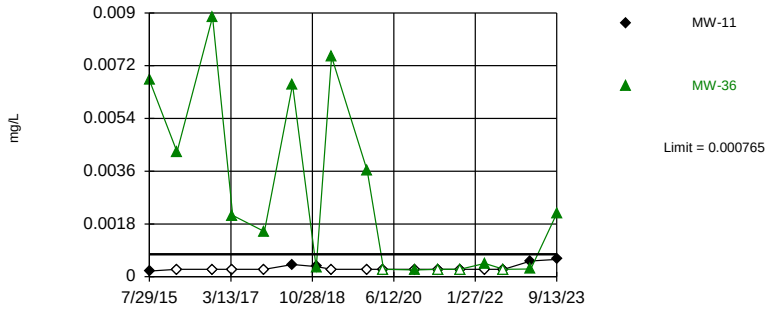
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 70.59% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Lead Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

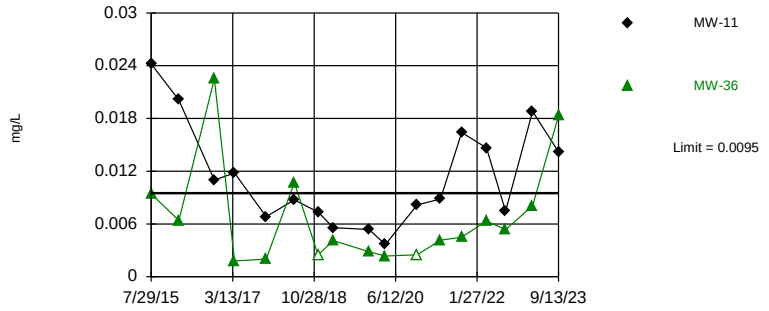
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-11, MW-36

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 82.35% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Nickel Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

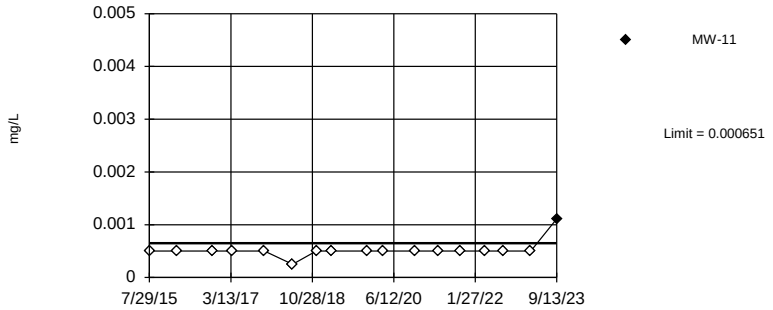
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-11

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 88.24% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Assumes 2 future values.

Constituent: Silver Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

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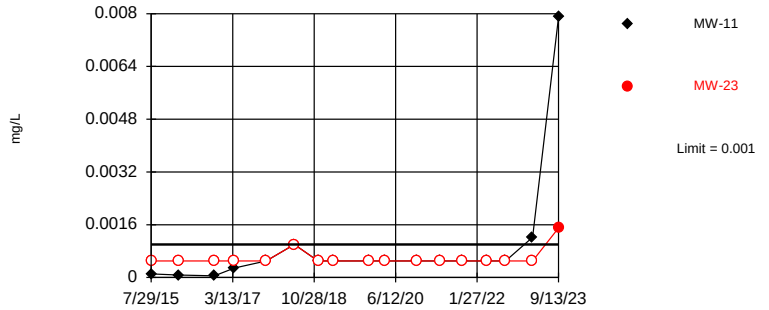
Hollow symbols indicate censored values.

Exceeds Limit: MW-11, MW-23

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 94.12% NDs. Annual per-constituent alpha = 0.03331. Individual comparison alpha = 0.00563 (1 of 2). Comparing 2 points to limit. Assumes 1 future value.

Constituent: Thallium Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

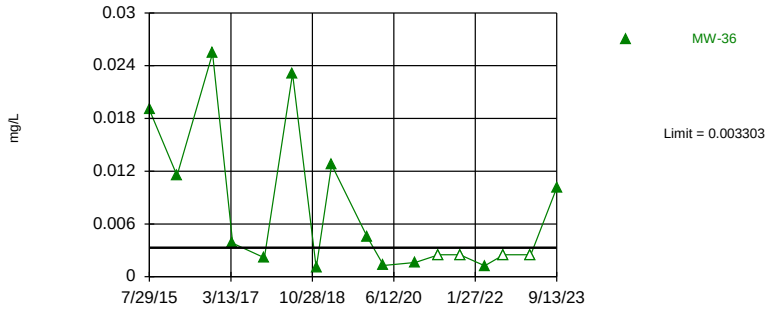
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-36

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-6.435, Std. Dev.=0.3271, n=17, 5.882% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8716, critical = 0.851. Kappa = 2.206 (c=15, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.003506. Individual comparison alpha = 0.00117. Assumes 2 future values.

Constituent: Vanadium Analysis Run 10/18/2023 10:52 AM View: 2023AWQR - AM PL

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - DS

Intrawell Prediction Limits Summary Table and Graphs – UD-0

Prediction Limit

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT Printed 10/18/2023, 4:43 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Trans...	Alpha	Method
Antimony (mg/L)	UD-0	0.003544	n/a	9/13/2023	0.00225	No	5	40	No	0.0004877	Param Intra 1 of 2
Arsenic (mg/L)	UD-0	0.01777	n/a	9/13/2023	0.00344	No	5	0	No	0.0004877	Param Intra 1 of 2
Barium (mg/L)	UD-0	2.238	n/a	9/13/2023	0.94	No	5	0	No	0.0004877	Param Intra 1 of 2
Cadmium (mg/L)	UD-0	0.0006667	n/a	9/13/2023	0.000305	No	5	20	No	0.0004877	Param Intra 1 of 2
Chromium (mg/L)	UD-0	0.01566	n/a	9/13/2023	0.00768	No	5	20	No	0.0004877	Param Intra 1 of 2
Cobalt (mg/L)	UD-0	0.05143	n/a	9/13/2023	0.0278	No	5	20	No	0.0004877	Param Intra 1 of 2
Copper (mg/L)	UD-0	0.03831	n/a	9/13/2023	0.0186	No	5	0	No	0.0004877	Param Intra 1 of 2
Lead (mg/L)	UD-0	0.002093	n/a	9/13/2023	0.00068	No	5	20	No	0.0004877	Param Intra 1 of 2
Nickel (mg/L)	UD-0	0.2588	n/a	9/13/2023	0.128	No	5	0	No	0.0004877	Param Intra 1 of 2
Selenium (mg/L)	UD-0	0.0025	n/a	9/13/2023	0.00366J	No	5	60	n/a	0.04755	NP Intra (NDs) 1 of 2
Thallium (mg/L)	UD-0	0.001	n/a	9/13/2023	0.0005ND	No	5	80	n/a	0.04755	NP Intra (NDs) 1 of 2
Vanadium (mg/L)	UD-0	0.007934	n/a	9/13/2023	0.00306J	No	5	20	x^(1/3)	0.0004877	Param Intra 1 of 2

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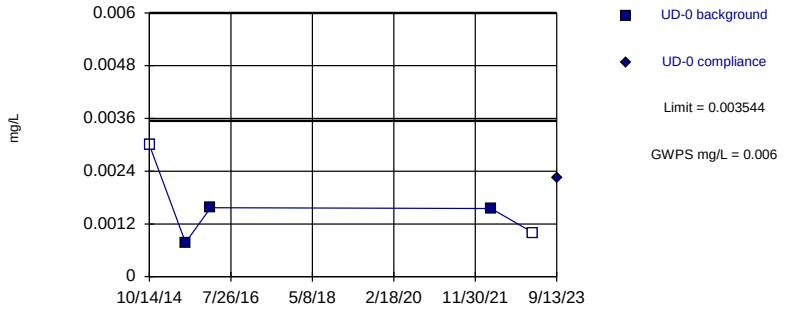
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.001299, Std. Dev.=0.0003692, n=5, 40% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8698, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

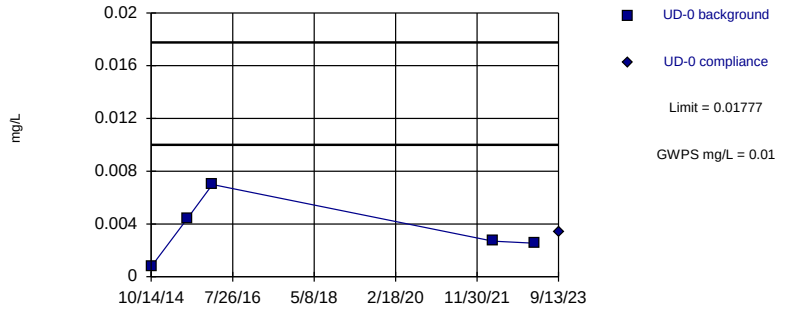
Constituent: Antimony Analysis Run 10/18/2023 4:41 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.00348, Std. Dev.=0.002349, n=5. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.955, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

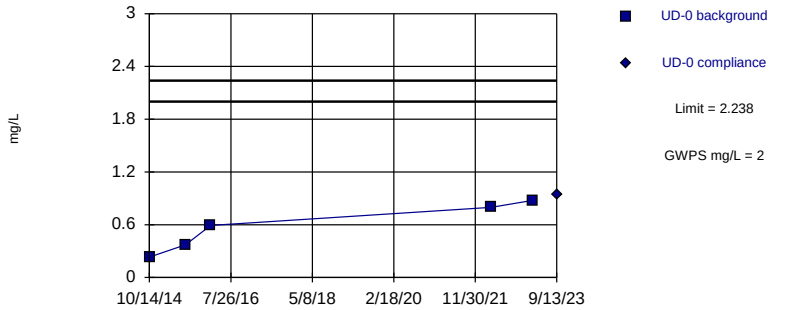
Constituent: Arsenic Analysis Run 10/18/2023 4:41 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Sanitas™ v.9.6.37 Software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.574, Std. Dev.=0.2737, n=5. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9418, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Barium Analysis Run 10/18/2023 4:41 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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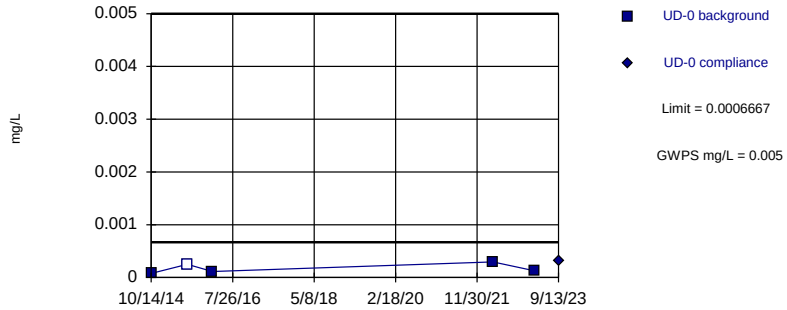
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.0001527, Std. Dev.=0.00008452, n=5, 20% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8783, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Cadmium Analysis Run 10/18/2023 4:41 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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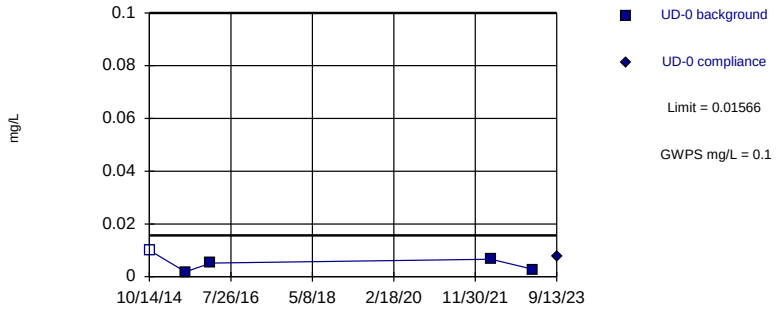
Hollow symbols indicate censored values.
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.00411, Std. Dev.=0.001899, n=5, 20% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.956, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Chromium Analysis Run 10/18/2023 4:41 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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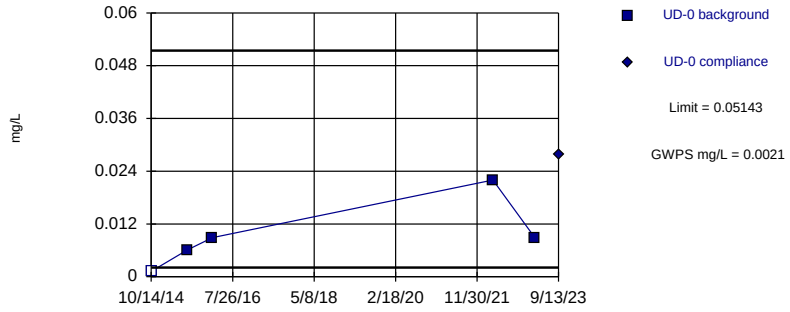
Hollow symbols indicate censored values.
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.00873, Std. Dev.=0.007021, n=5, 20% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8855, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Cobalt Analysis Run 10/18/2023 4:41 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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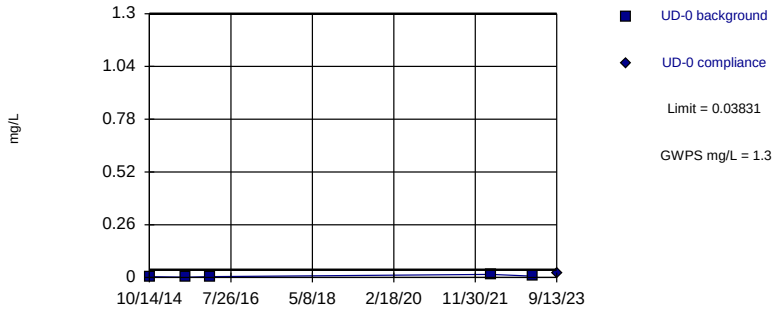
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.006164, Std. Dev.=0.005286, n=5. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.856, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Copper Analysis Run 10/18/2023 4:42 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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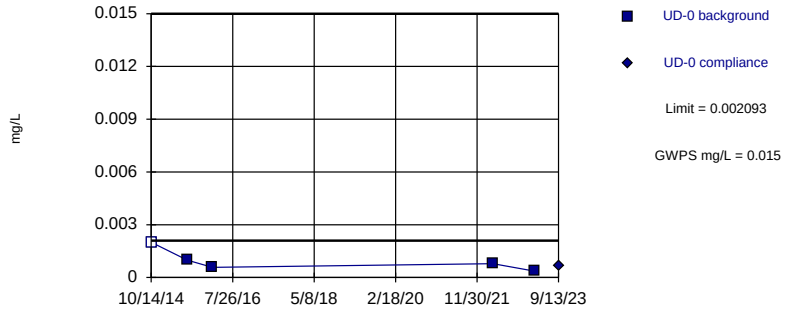
Hollow symbols indicate censored values.
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.0006745, Std. Dev.=0.0002333, n=5, 20% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8727, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Lead Analysis Run 10/18/2023 4:42 PM View: 2023AWQR - IntraPL UD-0
Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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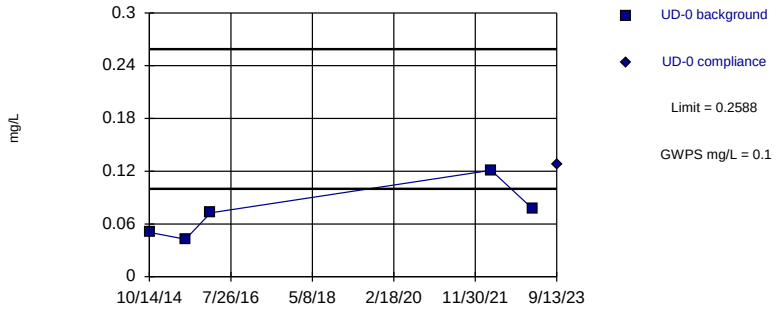
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.07274, Std. Dev.=0.03059, n=5. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9108, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Nickel Analysis Run 10/18/2023 4:42 PM View: 2023AWQR - IntraPL UD-0

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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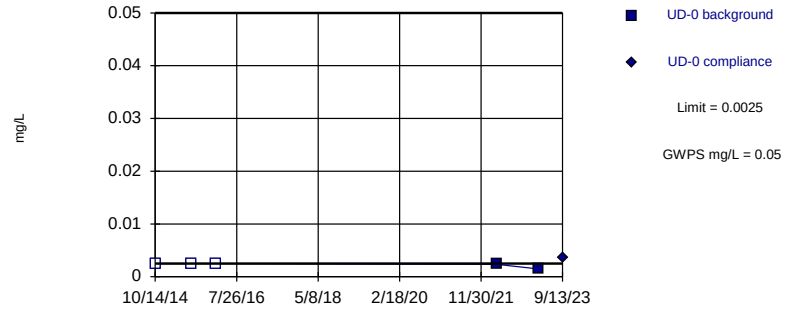
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 5 background values. 60% NDs. Well-constituent pair annual alpha = 0.09284. Individual comparison alpha = 0.04755 (1 of 2).

Constituent: Selenium Analysis Run 10/18/2023 4:42 PM View: 2023AWQR - IntraPL UD-0

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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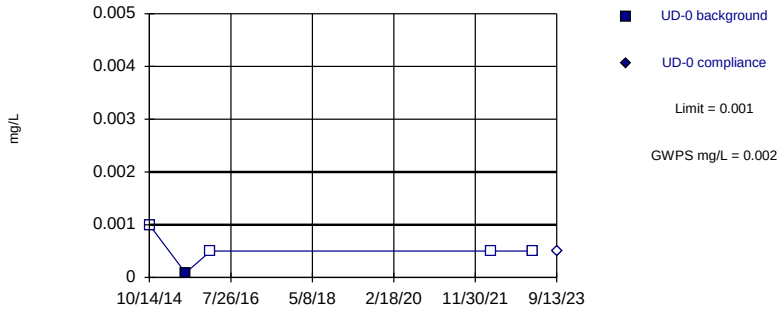
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 5 background values. 80% NDs. Well-constituent pair annual alpha = 0.09284. Individual comparison alpha = 0.04755 (1 of 2).

Constituent: Thallium Analysis Run 10/18/2023 4:42 PM View: 2023AWQR - IntraPL UD-0

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

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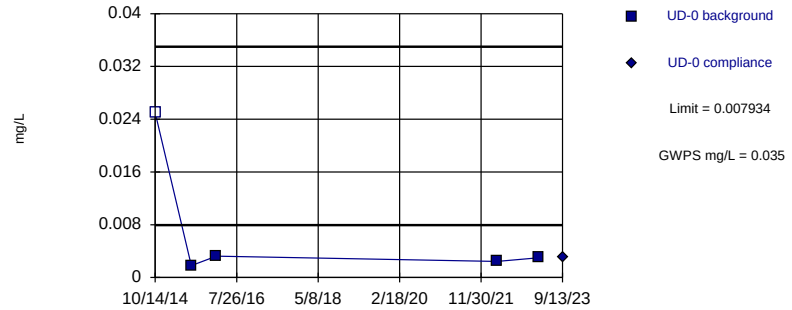
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on cube root transformation) (after Kaplan-Meier Adjustment): Mean=0.1371, Std. Dev.=0.01026, n=5, 20% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.6923, critical = 0.686. Kappa = 6.082 (c=12, w=9, 1 of 2, event alpha = 0.05132). Report alpha = 0.0004877.

Constituent: Vanadium Analysis Run 10/18/2023 4:42 PM View: 2023AWQR - IntraPL UD-0

Cass County SLF Client: SCS Engineers Consulting Data: CASSC Sanitas Master - WT

Mann-Kendall Trending Test Summary Table and Graphs – Water Table

Trend Test

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR Printed 10/19/2023, 11:08 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Arsenic (mg/L)	MW-21	-0.0002682	-4	-21	No	8	0	0.01	NP
Arsenic (mg/L)	MW-24	-0.0004038	-8	-21	No	8	0	0.01	NP
Barium (mg/L)	MW-19	0.05189	9	21	No	8	0	0.01	NP
Barium (mg/L)	MW-21	0.1204	14	21	No	8	0	0.01	NP
Barium (mg/L)	MW-24	0.02594	4	21	No	8	0	0.01	NP
Barium (mg/L)	MW-37R	0.005732	2	21	No	8	0	0.01	NP
Barium (mg/L)	**MW-38R**	**-0.1415**	**-26**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Barium (mg/L)	MW-39	-0.001027	-2	-21	No	8	0	0.01	NP
Benzene (ug/L)	MW-19	0.1263	12	21	No	8	12.5	0.01	NP
Cadmium (mg/L)	MW-19	0	-4	-21	No	8	75	0.01	NP
Cadmium (mg/L)	MW-24	-0.0001168	-3	-14	No	6	0	0.01	NP
Cadmium (mg/L)	MW-37R	-0.00001312	-2	-21	No	8	0	0.01	NP
Cadmium (mg/L)	**MW-38R**	**-0.00009238**	**-22**	**-21**	**Yes**	**8**	**12.5**	**0.01**	**NP**
Cadmium (mg/L)	MW-39	0.000009416	18	21	No	8	62.5	0.01	NP
Carbon Disulfide (ug/L)	MW-21	0	9	21	No	8	75	0.01	NP
Chlorobenzene (ug/L)	MW-19	0.3582	14	21	No	8	12.5	0.01	NP
Chlorobenzene (ug/L)	MW-24	-0.1834	-2	-12	No	5	0	0.01	NP
Cobalt (mg/L)	MW-19	0.002065	18	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-21	0.001192	20	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-24	0.0007261	12	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-37R	0.0002859	8	21	No	8	12.5	0.01	NP
Cobalt (mg/L)	MW-38R	-0.0002348	-16	-21	No	8	0	0.01	NP
gamma-Chlordane (ug/L)	MW-19	0.03413	9	21	No	8	62.5	0.01	NP
Lead (mg/L)	MW-37R	0.0003143	4	21	No	8	25	0.01	NP
Lead (mg/L)	MW-38R	-0.000007987	-5	-21	No	8	37.5	0.01	NP
Lead (mg/L)	MW-39	0	7	21	No	8	87.5	0.01	NP
Nickel (mg/L)	MW-19	-0.0002867	0	21	No	8	0	0.01	NP
Nickel (mg/L)	MW-21	0.0006409	18	21	No	8	12.5	0.01	NP
Nickel (mg/L)	MW-24	0.001967	4	21	No	8	0	0.01	NP
Nickel (mg/L)	MW-37R	-0.0001644	0	21	No	8	0	0.01	NP
Nickel (mg/L)	MW-38R	-0.001568	-20	-21	No	8	0	0.01	NP
Selenium (mg/L)	MW-37R	0.005132	20	21	No	8	0	0.01	NP
Selenium (mg/L)	MW-38R	0.006443	15	21	No	8	37.5	0.01	NP
Selenium (mg/L)	MW-39	0.001157	8	21	No	8	0	0.01	NP
Sulfide (mg/L)	MW-21	-0.09432	-20	-21	No	8	50	0.01	NP
Thallium (mg/L)	MW-39	0	7	21	No	8	87.5	0.01	NP
Toluene (ug/L)	MW-21	0	-7	-21	No	8	87.5	0.01	NP
Toluene (ug/L)	MW-37R	0	-3	-21	No	8	87.5	0.01	NP
Toluene (ug/L)	MW-38R	0	-3	-21	No	8	75	0.01	NP
Vanadium (mg/L)	MW-37R	0.0003478	2	21	No	8	0	0.01	NP
Vanadium (mg/L)	MW-39	0	11	21	No	8	75	0.01	NP
Xylenes, total (ug/L)	MW-37R	0	-3	-21	No	8	87.5	0.01	NP
Xylenes, total (ug/L)	MW-38R	0	-3	-21	No	8	75	0.01	NP

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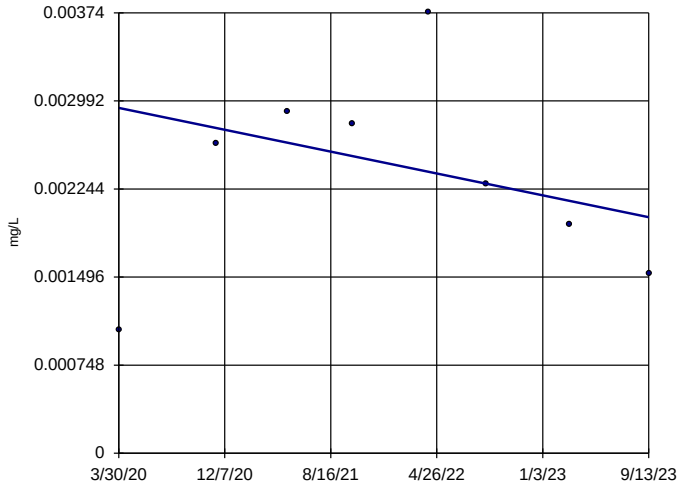
Sen's Slope Estimator

MW-21



n = 8

Slope = -0.0002682 units per year.

Mann-Kendall statistic = -4 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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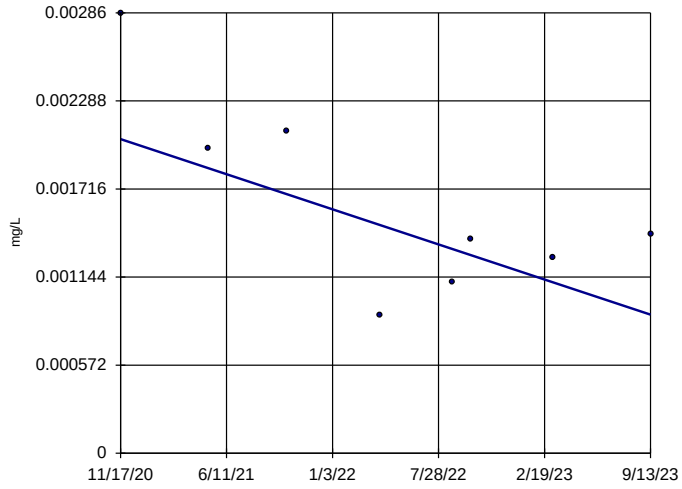
Sen's Slope Estimator

MW-24



n = 8

Slope = -0.0004038 units per year.

Mann-Kendall statistic = -8 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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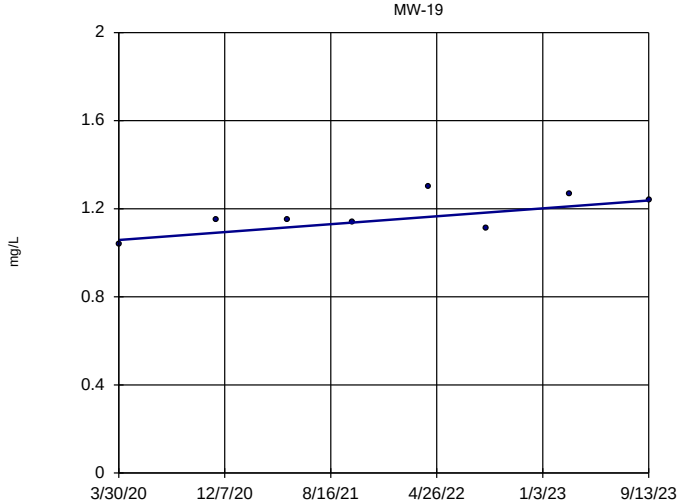
Sen's Slope Estimator

MW-19



n = 8

Slope = 0.05189 units per year.

Mann-Kendall statistic = 9 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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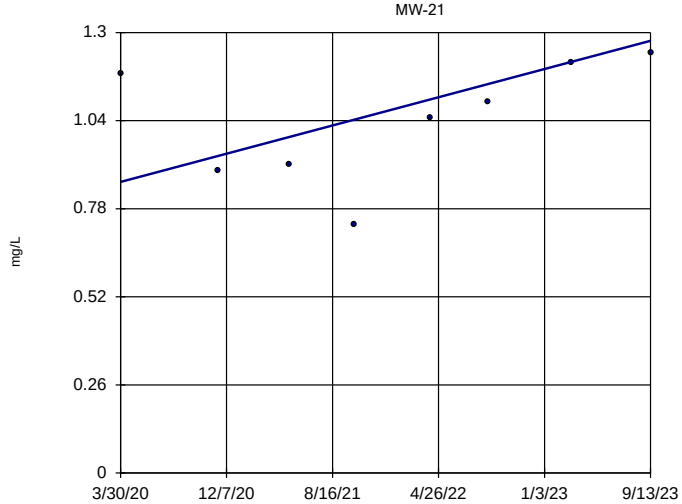
Sen's Slope Estimator

MW-21



n = 8

Slope = 0.1204 units per year.

Mann-Kendall statistic = 14 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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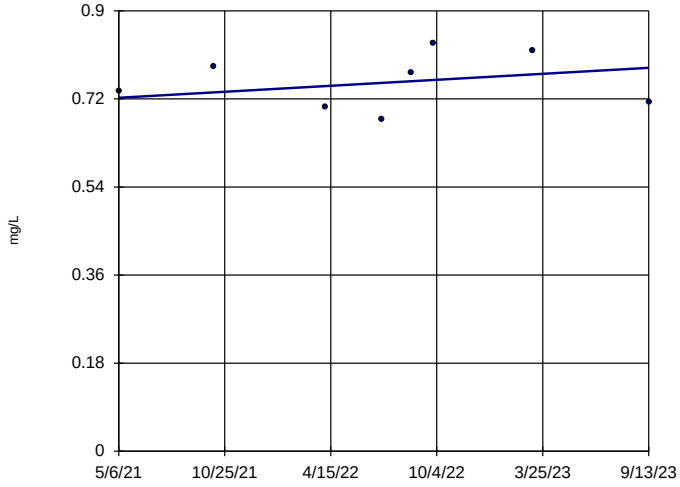
Sen's Slope Estimator

MW-24



n = 8

Slope = 0.02594 units per year.

Mann-Kendall statistic = 4 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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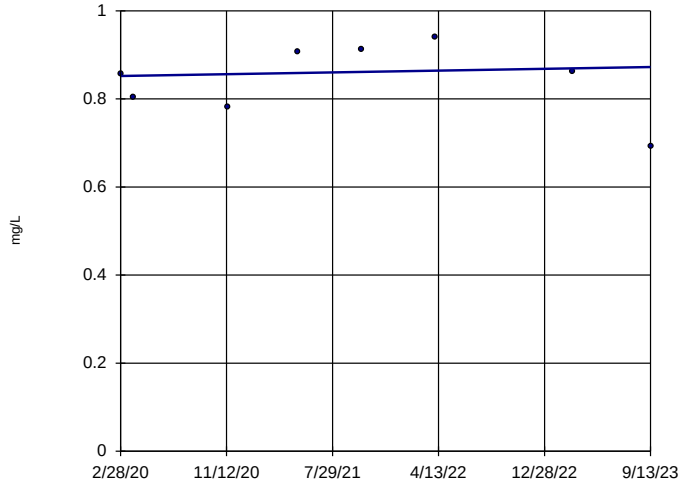
Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.005732 units per year.

Mann-Kendall statistic = 2 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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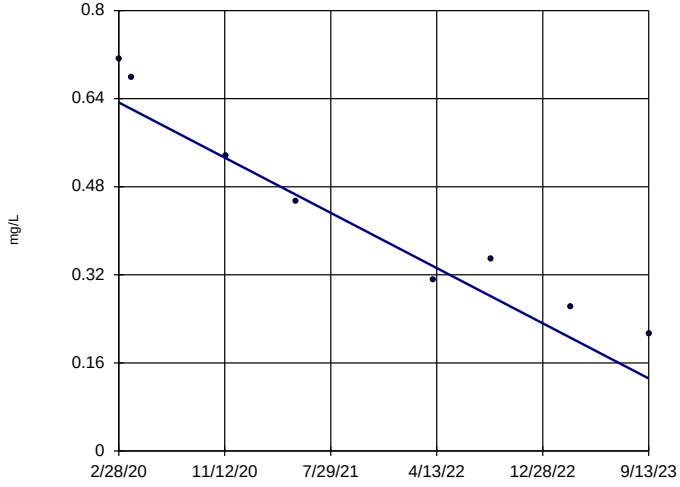
Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.1415 units per year.

Mann-Kendall statistic = -26 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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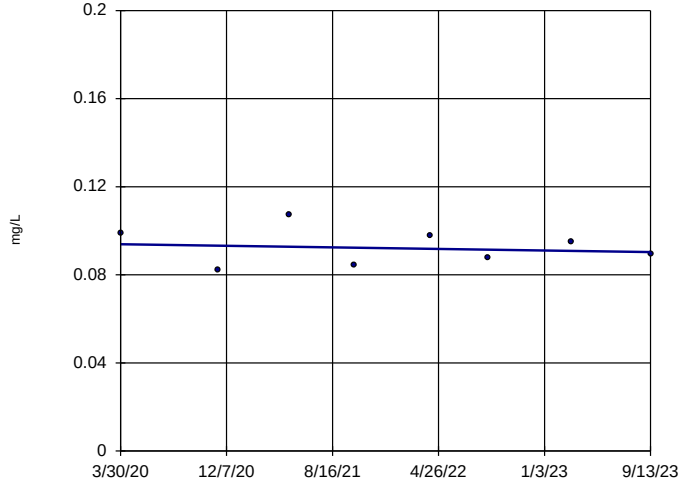
Sen's Slope Estimator

MW-39



n = 8

Slope = -0.001027 units per year.

Mann-Kendall statistic = -2 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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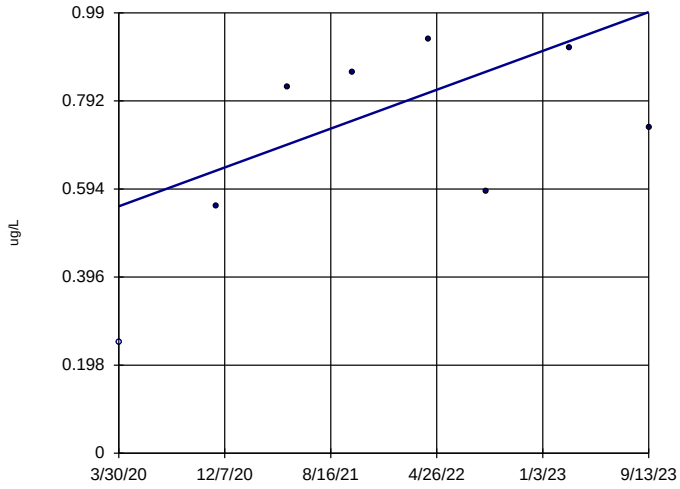
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0.1263 units per year.

Mann-Kendall statistic = 12 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Benzene Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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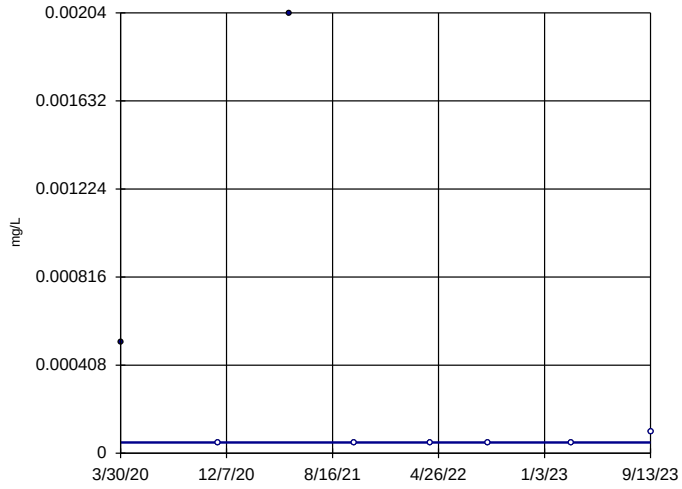
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -4 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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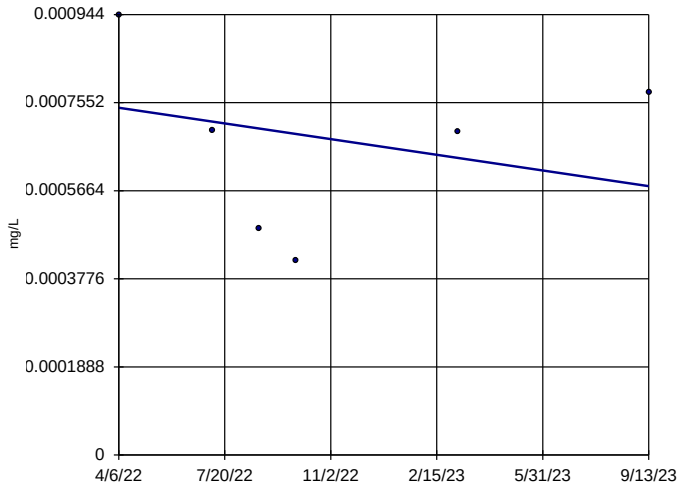
Sen's Slope Estimator

MW-24



n = 6

Slope = -0.0001168 units per year.

Mann-Kendall statistic = -3 critical = -14

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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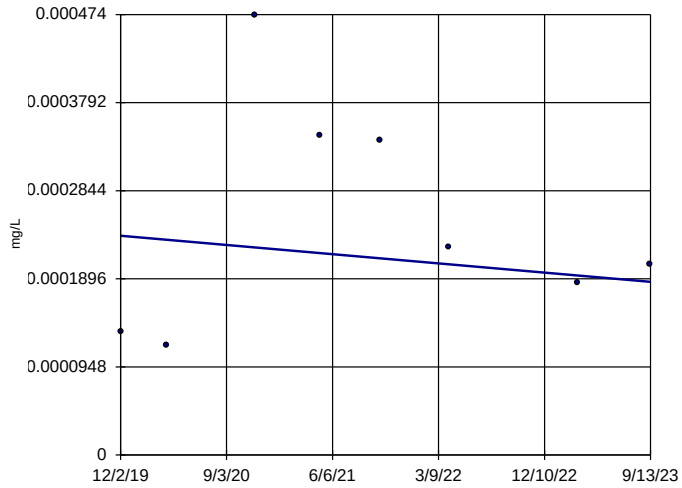
Sen's Slope Estimator

MW-37R



n = 8

Slope = -0.00001312 units per year.

Mann-Kendall statistic = -2 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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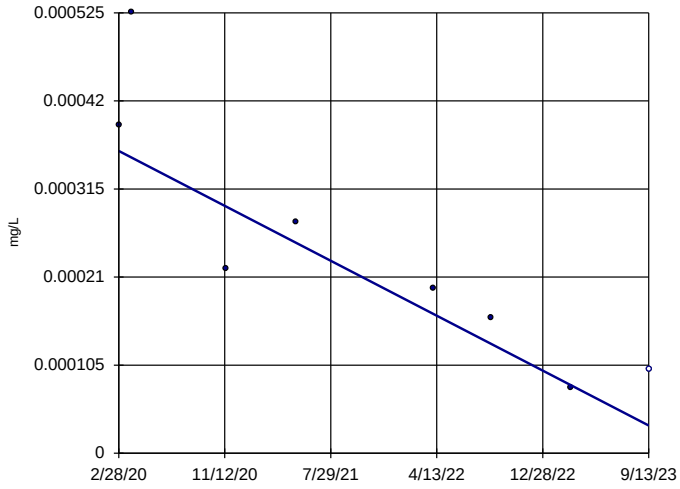
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.00009238 units per year.

Mann-Kendall statistic = -22 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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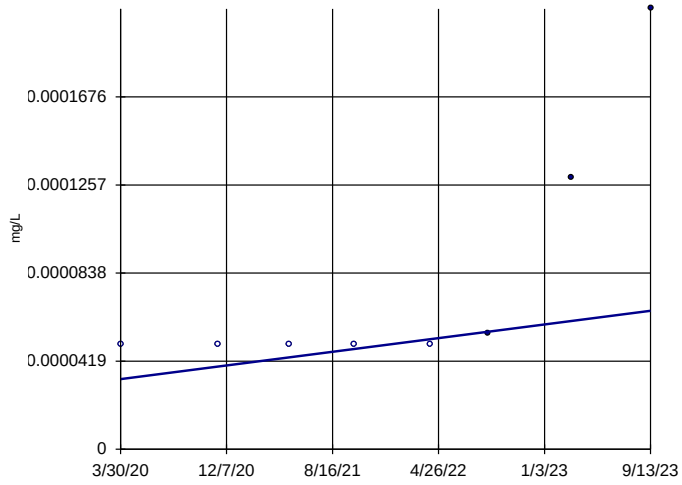
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-39



n = 8

Slope = 0.000009416 units per year.

Mann-Kendall statistic = 18 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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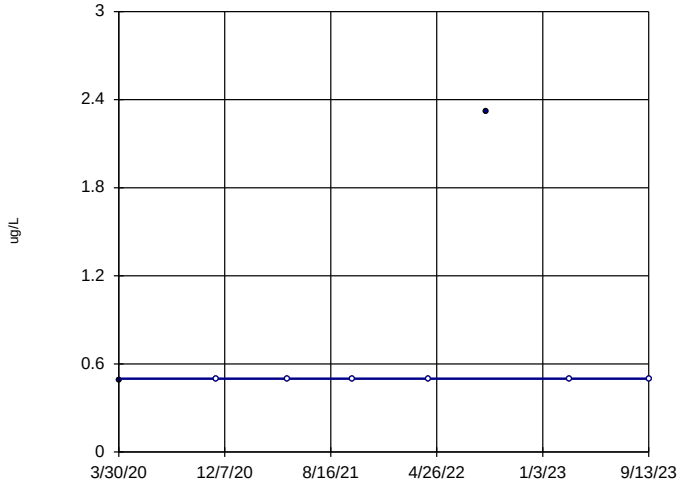
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 9 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Carbon Disulfide Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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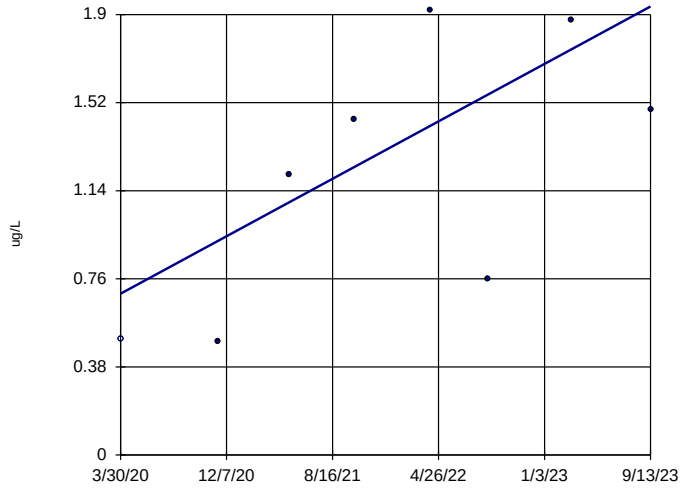
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0.3582 units per year.

Mann-Kendall statistic = 14 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chlorobenzene Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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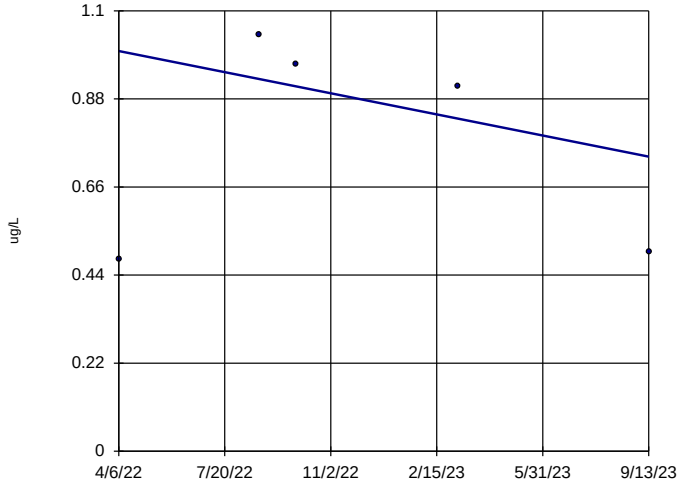
Sen's Slope Estimator

MW-24



n = 5

Slope = -0.1834 units per year.

Mann-Kendall statistic = -2 critical = -12

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chlorobenzene Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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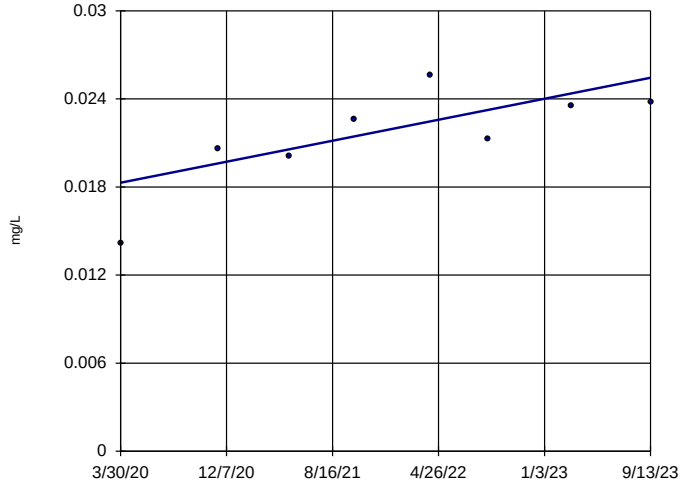
Sen's Slope Estimator

MW-19



n = 8

Slope = 0.002065 units per year.

Mann-Kendall statistic = 18 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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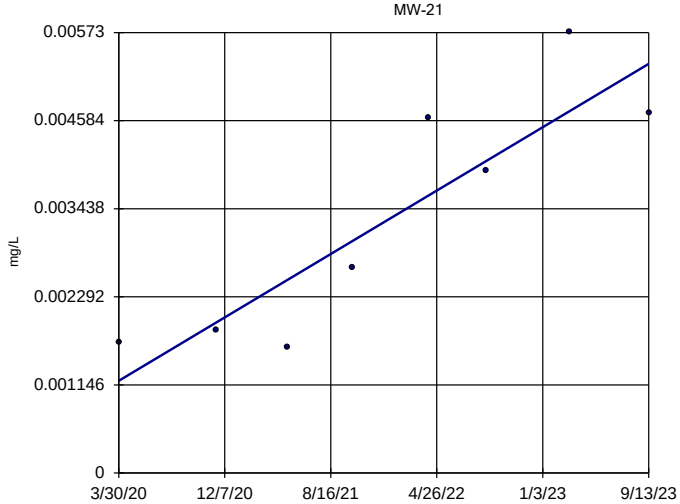
Sen's Slope Estimator

MW-21



n = 8

Slope = 0.001192 units per year.

Mann-Kendall statistic = 20 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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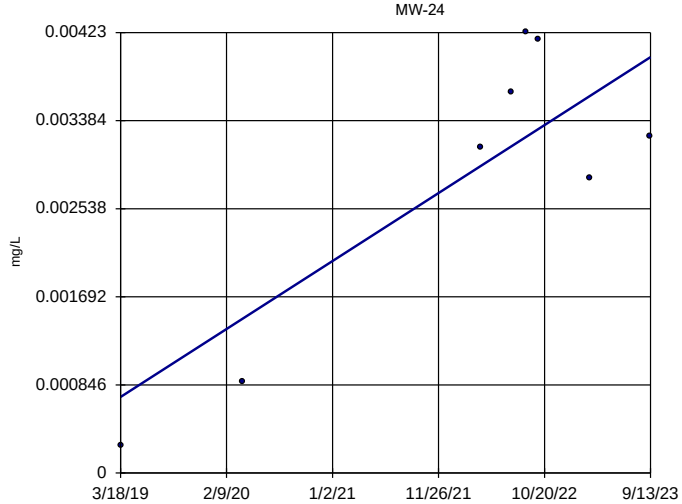
Sen's Slope Estimator

MW-24



n = 8

Slope = 0.0007261 units per year.

Mann-Kendall statistic = 12 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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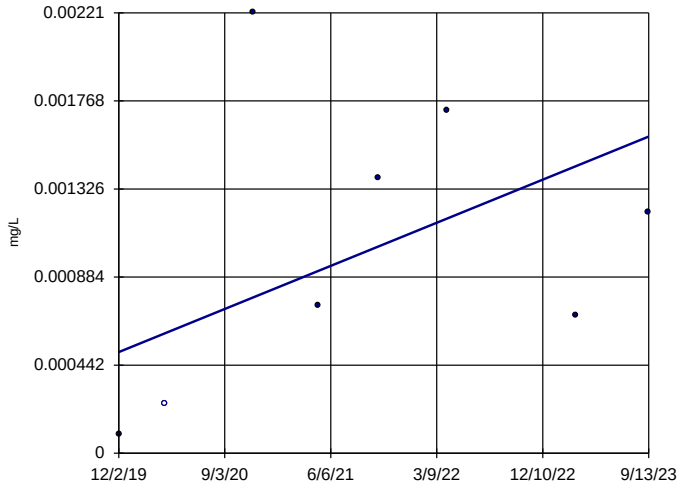
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.0002859 units per year.

Mann-Kendall statistic = 8 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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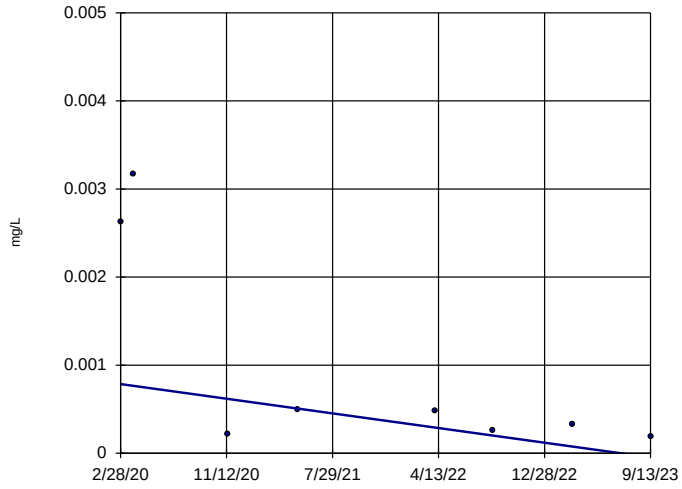
Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.0002348 units per year.

Mann-Kendall statistic = -16 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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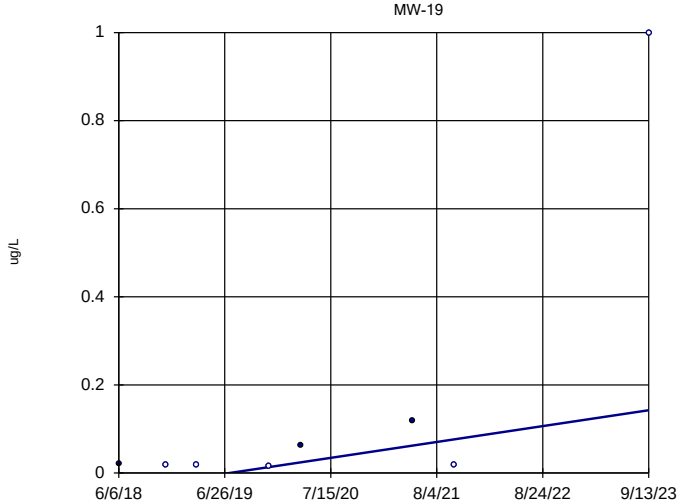
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-19



n = 8

Slope = 0.03413 units per year.

Mann-Kendall statistic = 9 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: gamma-Chlordane Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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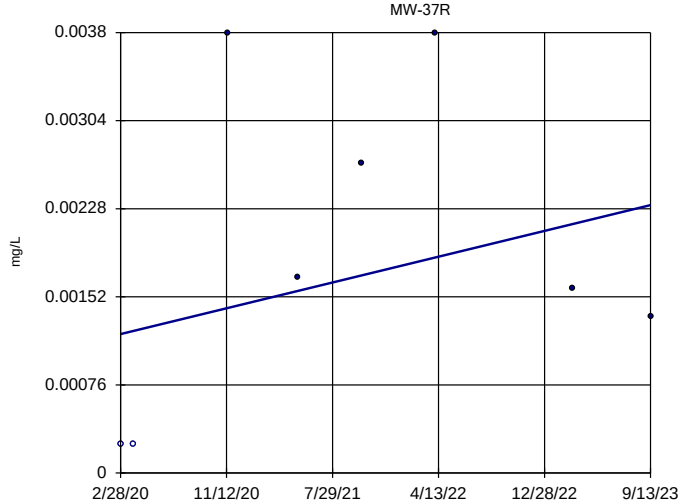
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.0003143 units per year.

Mann-Kendall statistic = 4 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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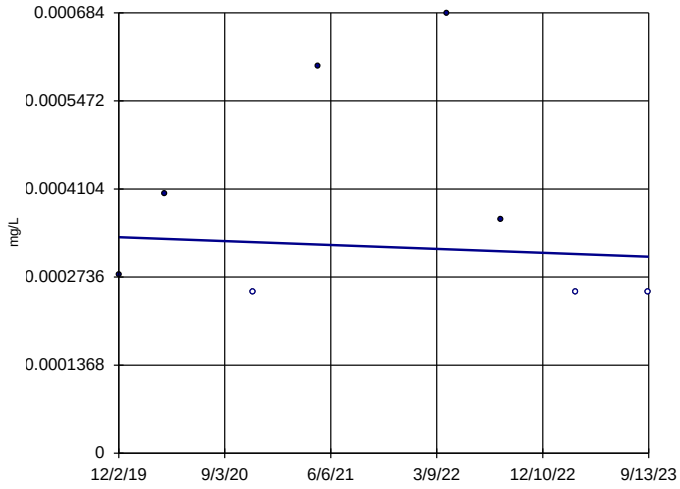
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.000007987 units per year.

Mann-Kendall statistic = -5 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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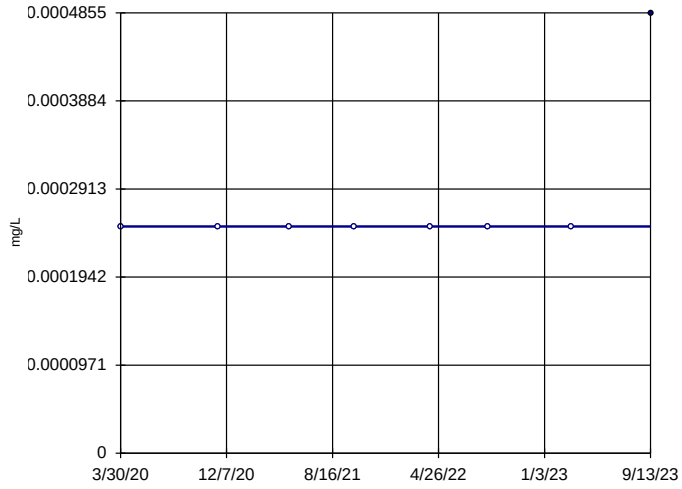
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-39



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Lead Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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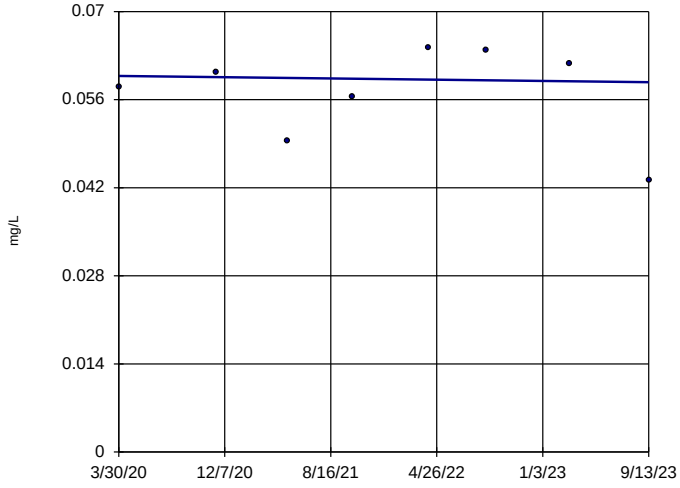
Sen's Slope Estimator

MW-19



n = 8

Slope = -0.0002867 units per year.

Mann-Kendall statistic = 0 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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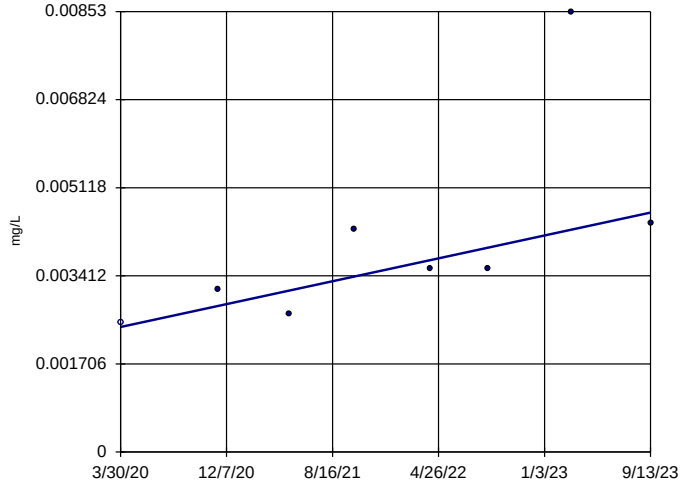
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = 0.0006409 units per year.

Mann-Kendall statistic = 18 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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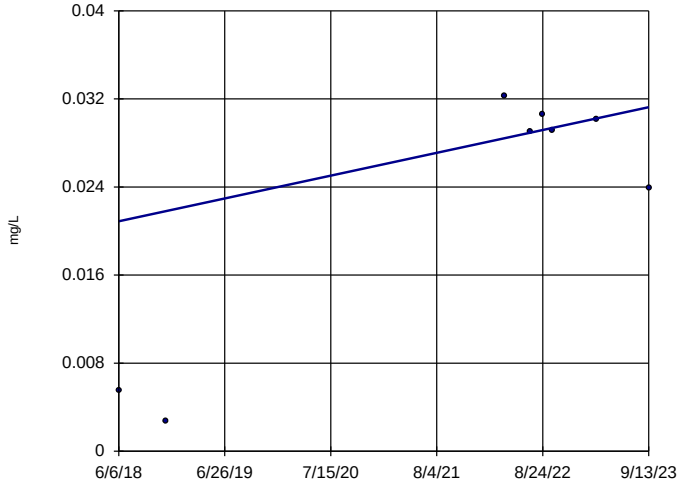
Sen's Slope Estimator

MW-24



n = 8

Slope = 0.001967 units per year.

Mann-Kendall statistic = 4 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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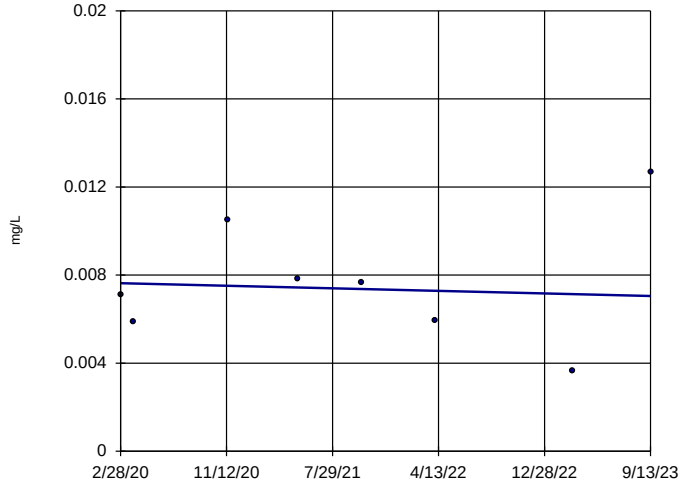
Sen's Slope Estimator

MW-37R



n = 8

Slope = -0.0001644 units per year.

Mann-Kendall statistic = 0 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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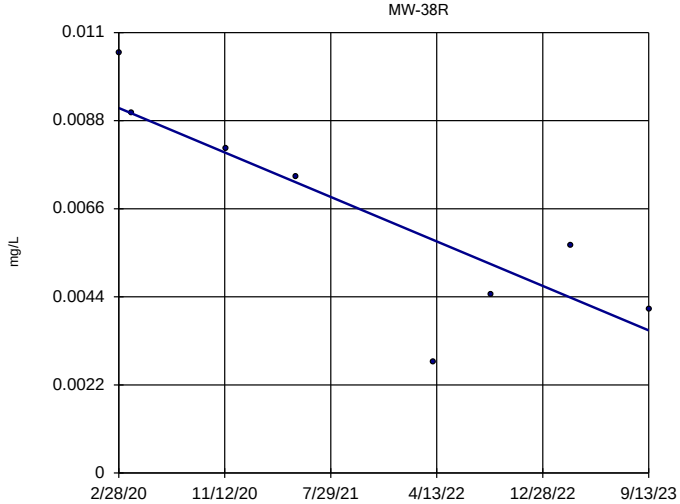
Sen's Slope Estimator

MW-38R



n = 8

Slope = -0.001568 units per year.

Mann-Kendall statistic = -20 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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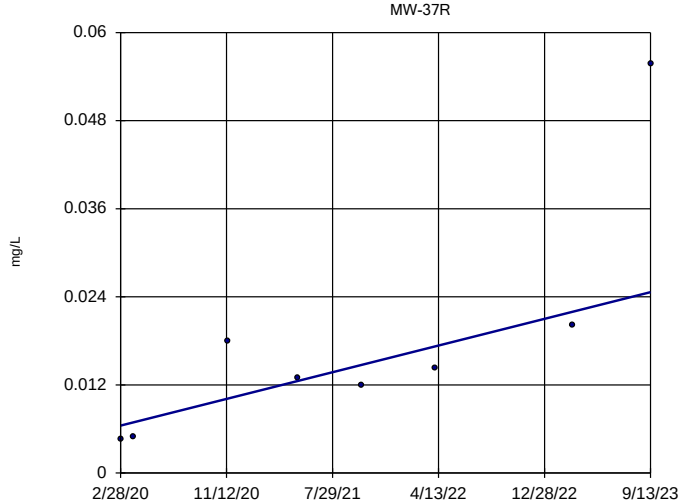
Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.005132 units per year.

Mann-Kendall statistic = 20 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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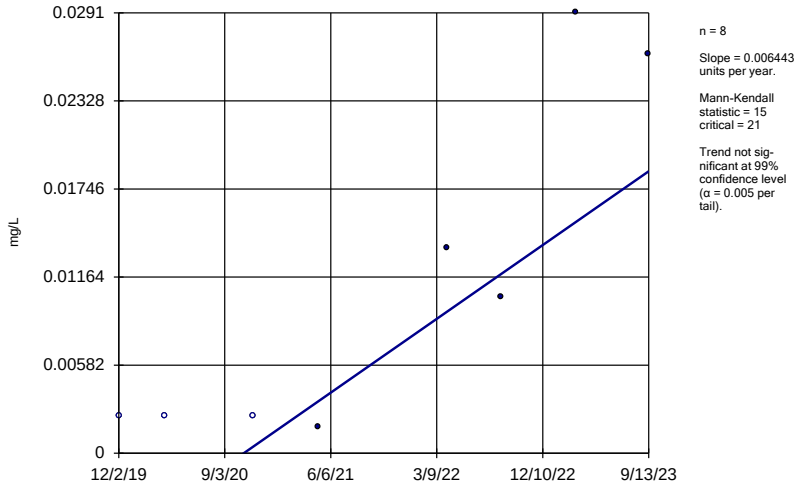
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0.006443 units per year.

Mann-Kendall statistic = 15 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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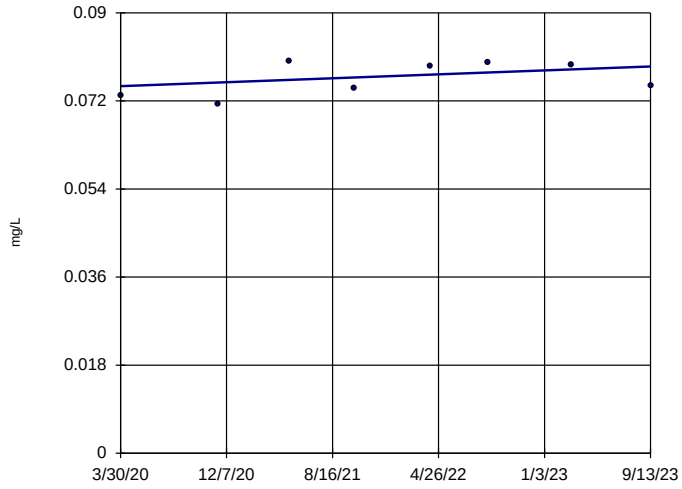
Sen's Slope Estimator

MW-39



n = 8

Slope = 0.001157 units per year.

Mann-Kendall statistic = 8 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Selenium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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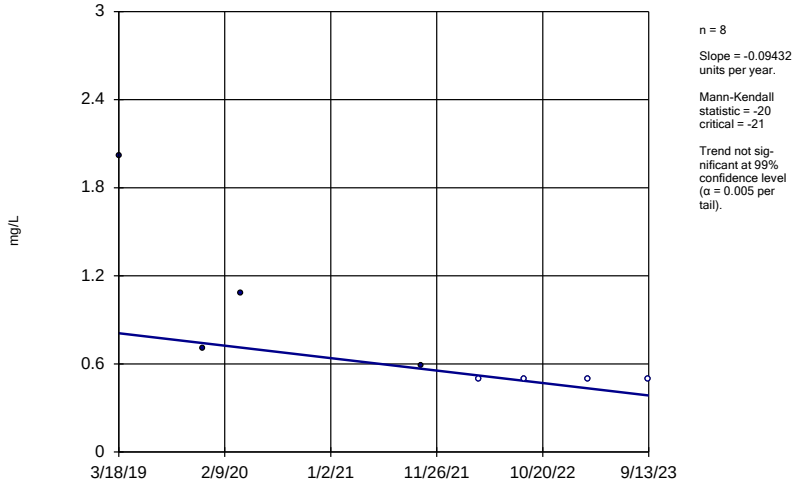
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = -0.09432 units per year.

Mann-Kendall statistic = -20 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfide Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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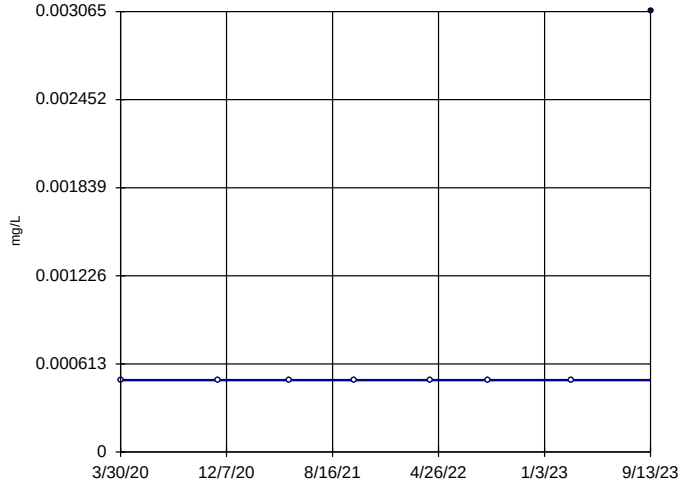
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-39



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Thallium Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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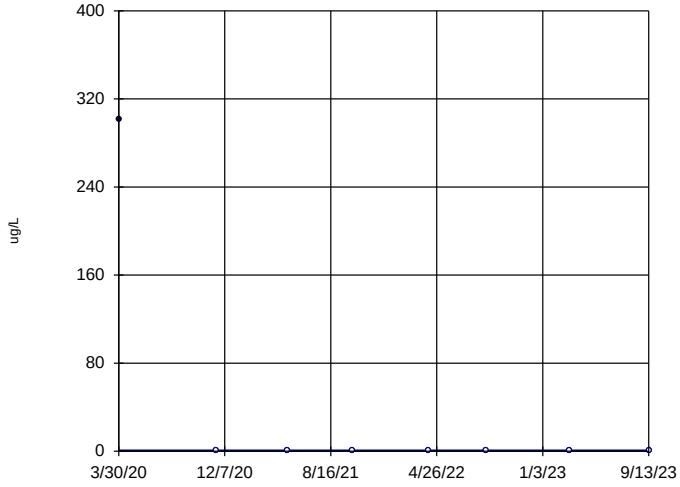
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-21



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -7
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Toluene Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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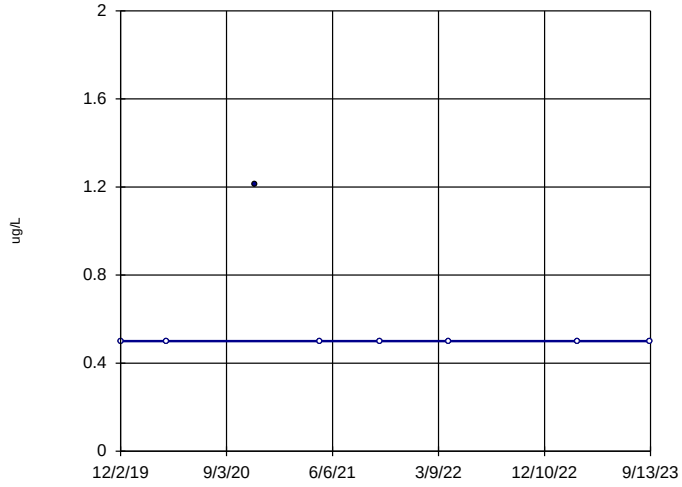
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-37R



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -3
critical = -21

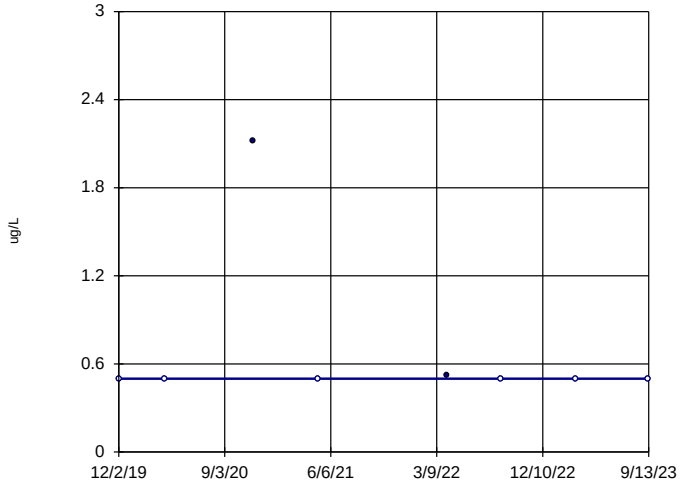
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Toluene Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-38R



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = -3
critical = -21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Toluene Analysis Run 10/19/2023 11:07 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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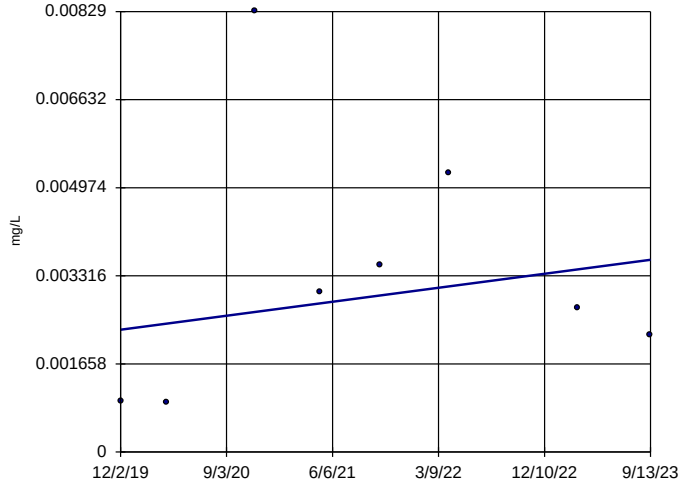
Sen's Slope Estimator

MW-37R



n = 8

Slope = 0.0003478
units per year.

Mann-Kendall
statistic = 2
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Vanadium Analysis Run 10/19/2023 11:08 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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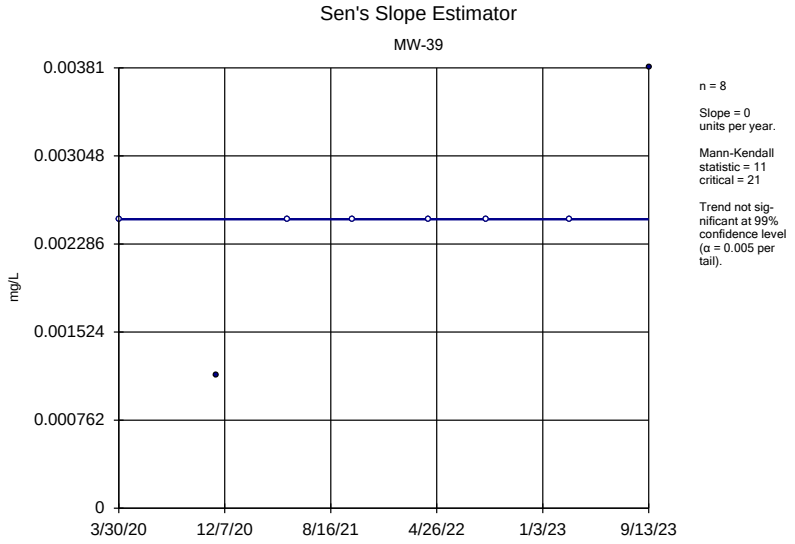
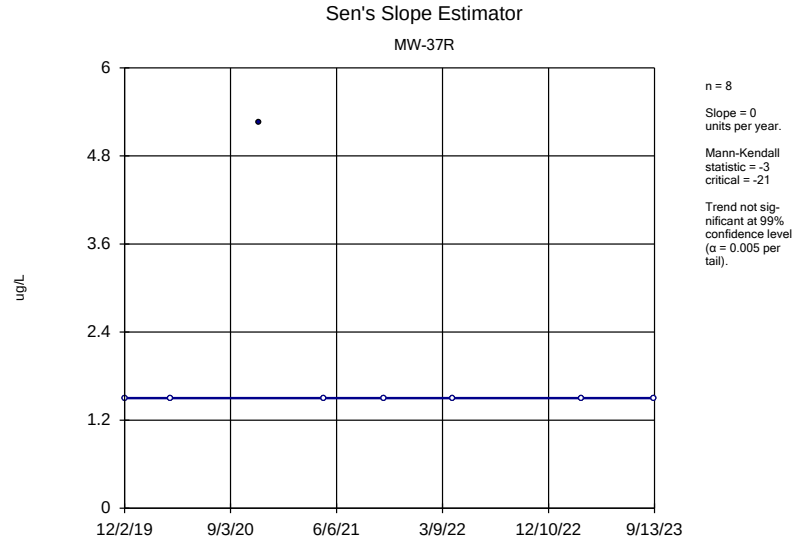
Hollow symbols indicate censored values.



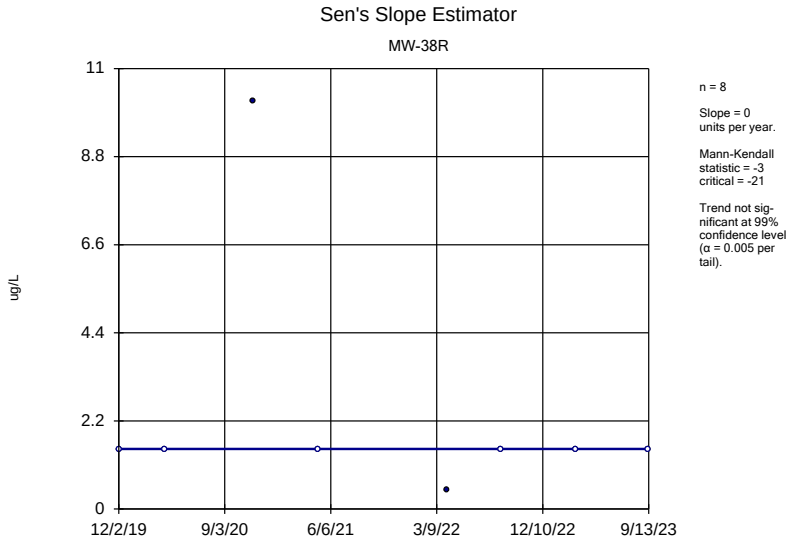
Constituent: Vanadium Analysis Run 10/19/2023 11:08 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Xylenes, total Analysis Run 10/19/2023 11:08 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Xylenes, total Analysis Run 10/19/2023 11:08 AM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Mann-Kendall Trending Test Summary Table and Graphs – Dakota Sandstone

Trend Test

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM Printed 10/18/2023, 12:19 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Antimony (mg/L)	MW-36	0	1	21	No	8	87.5	0.01	NP
Arsenic (mg/L)	MW-11	0.003189	16	21	No	8	0	0.01	NP
Barium (mg/L)	MW-11	0.07863	16	21	No	8	0	0.01	NP
Barium (mg/L)	MW-23	-0.002501	-6	-21	No	8	0	0.01	NP
Barium (mg/L)	MW-36	-0.05474	-20	-21	No	8	0	0.01	NP
Cadmium (mg/L)	MW-11	0.00004118	9	21	No	8	37.5	0.01	NP
Cadmium (mg/L)	MW-36	0.0001436	20	21	No	8	12.5	0.01	NP
Cobalt (mg/L)	MW-11	0.001356	10	21	No	8	0	0.01	NP
Cobalt (mg/L)	MW-36	0.0009181	20	21	No	8	12.5	0.01	NP
Copper (mg/L)	MW-36	0	9	21	No	8	75	0.01	NP
Lead (mg/L)	MW-11	0	13	21	No	8	75	0.01	NP
Lead (mg/L)	MW-36	0.00001565	16	21	No	8	50	0.01	NP
Nickel (mg/L)	MW-11	0.003778	12	21	No	8	0	0.01	NP
Nickel (mg/L)	**MW-36**	**0.002314**	**26**	**21**	**Yes**	**8**	**12.5**	**0.01**	**NP**
Silver (mg/L)	MW-11	0	7	21	No	8	87.5	0.01	NP
Thallium (mg/L)	MW-11	0	13	21	No	8	75	0.01	NP
Thallium (mg/L)	MW-23	0	7	21	No	8	87.5	0.01	NP
Vanadium (mg/L)	MW-36	0.0005295	14	21	No	8	50	0.01	NP

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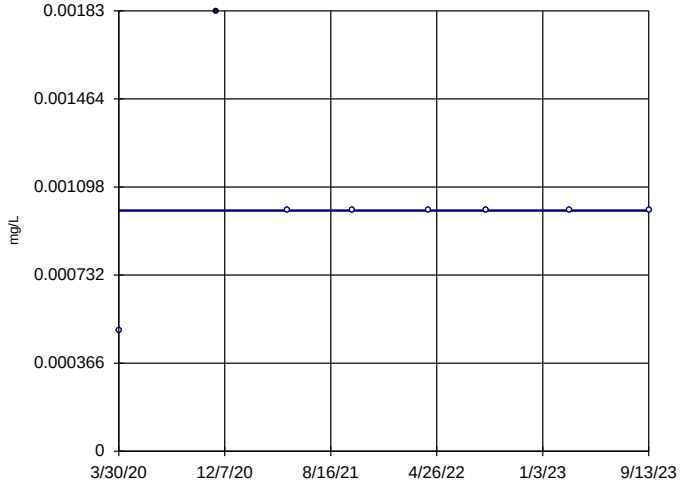
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 1 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Antimony Analysis Run 10/18/2023 12:17 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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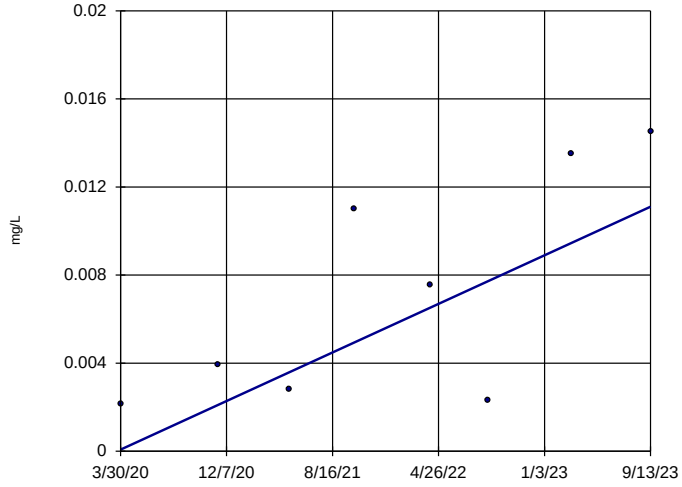
Sen's Slope Estimator

MW-11



n = 8

Slope = 0.003189 units per year.

Mann-Kendall statistic = 16 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Arsenic Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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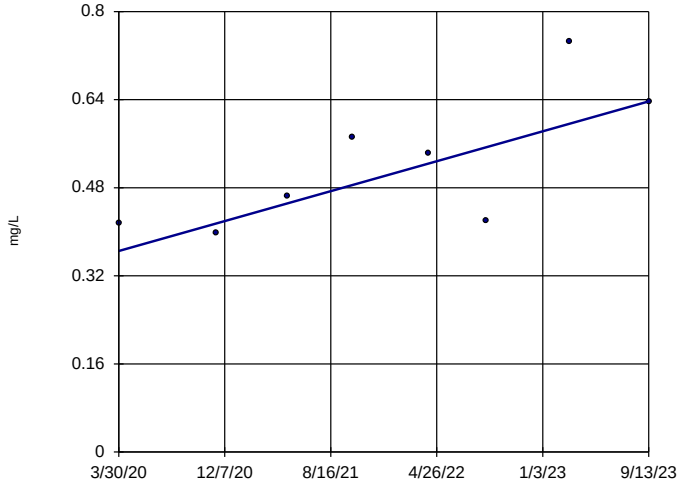
Sen's Slope Estimator

MW-11



n = 8

Slope = 0.07863 units per year.

Mann-Kendall statistic = 16 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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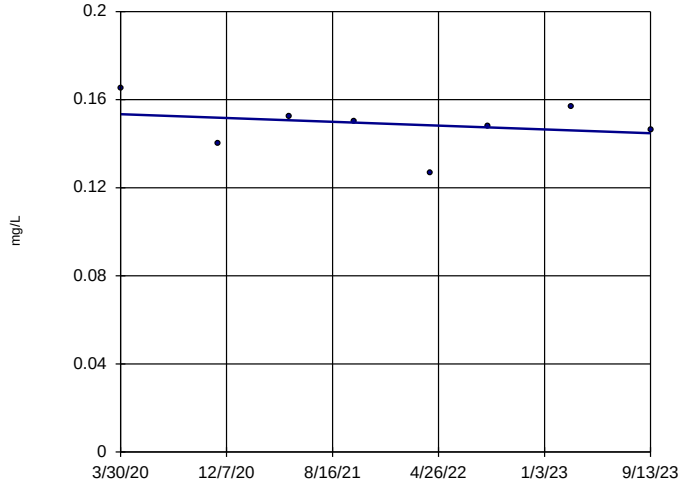
Sen's Slope Estimator

MW-23



n = 8

Slope = -0.002501 units per year.

Mann-Kendall statistic = -6 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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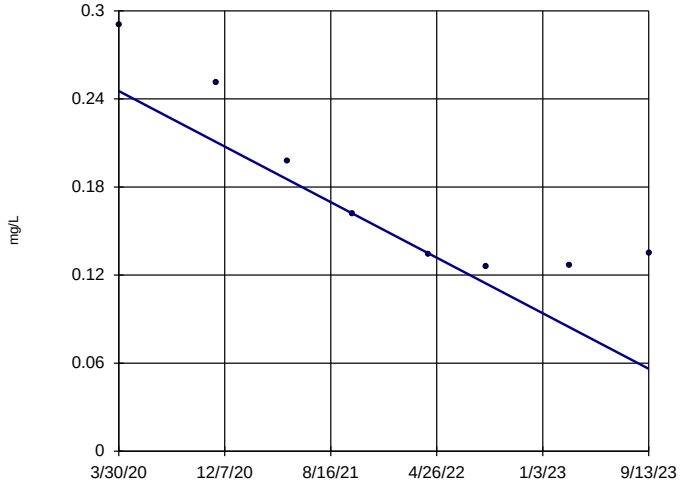
Sen's Slope Estimator

MW-36



n = 8

Slope = -0.05474 units per year.

Mann-Kendall statistic = -20 critical = -21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Barium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

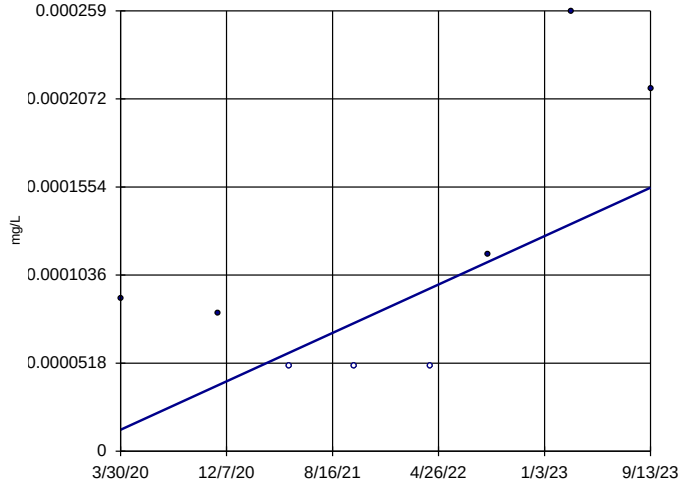
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-11



n = 8

Slope = 0.00004118 units per year.

Mann-Kendall statistic = 9 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cadmium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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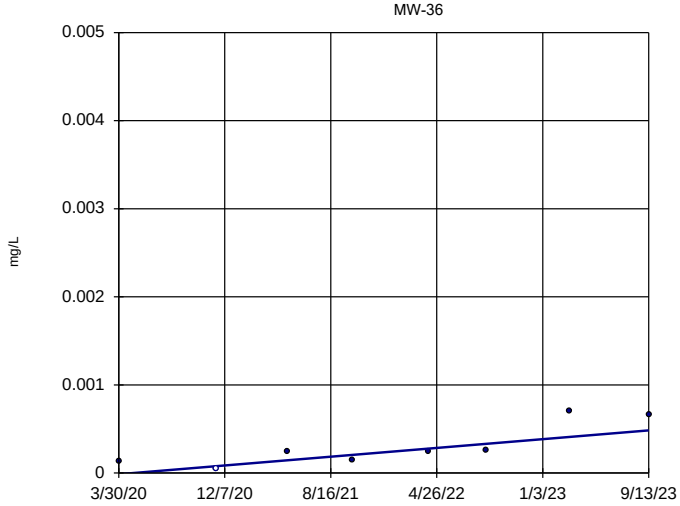
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0.0001436 units per year.

Mann-Kendall statistic = 20 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

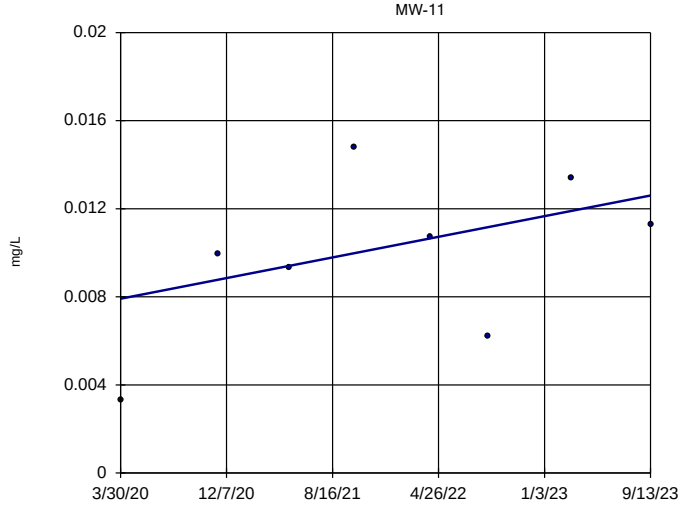
Constituent: Cadmium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-11



n = 8

Slope = 0.001356 units per year.

Mann-Kendall statistic = 10 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Cobalt Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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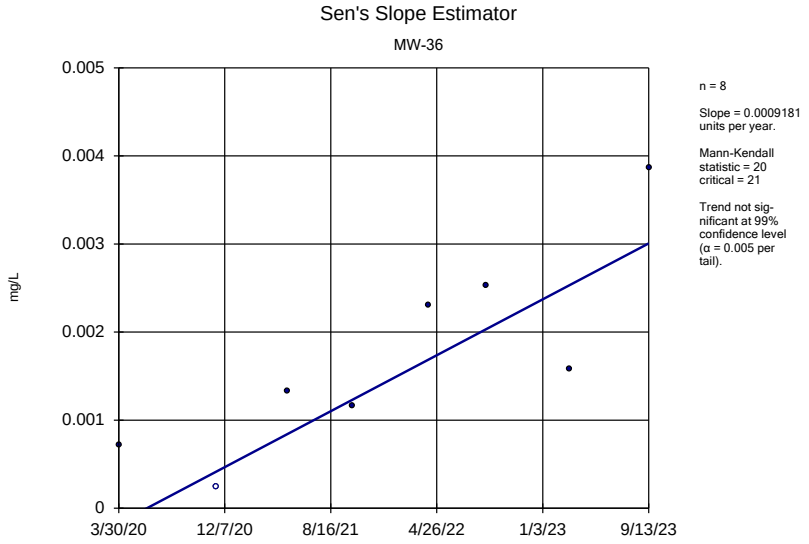
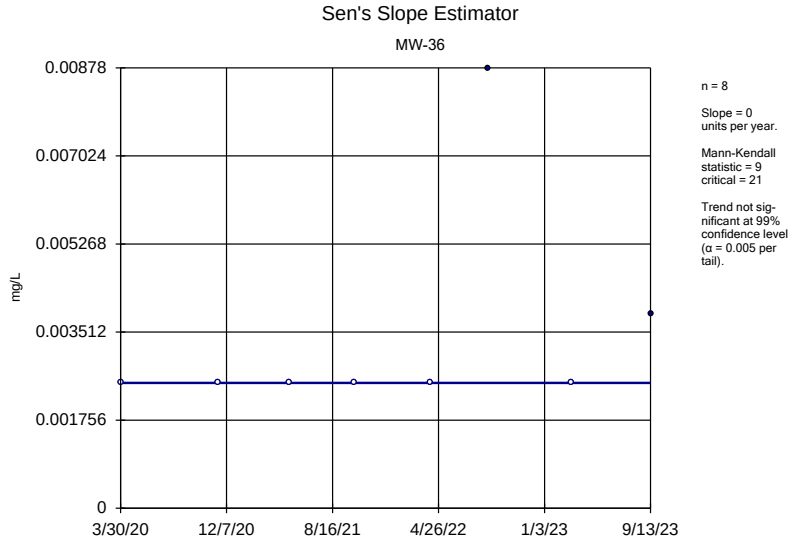
Hollow symbols indicate censored values.



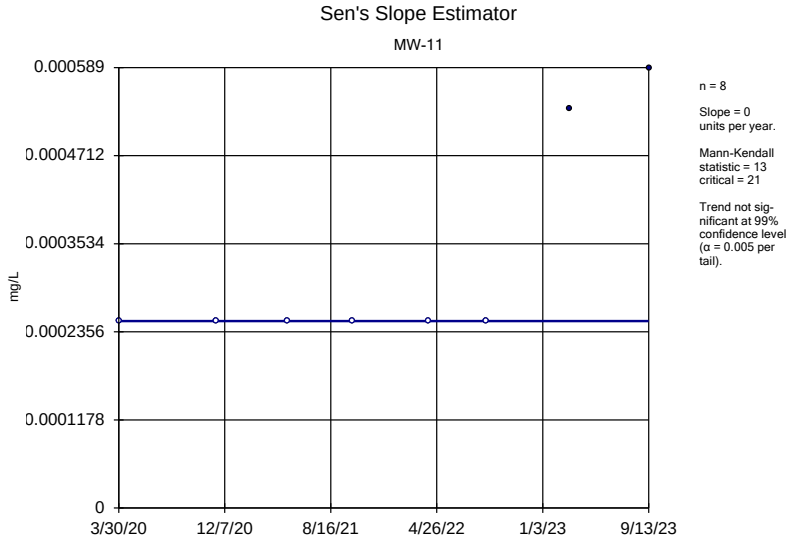
Constituent: Cobalt Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



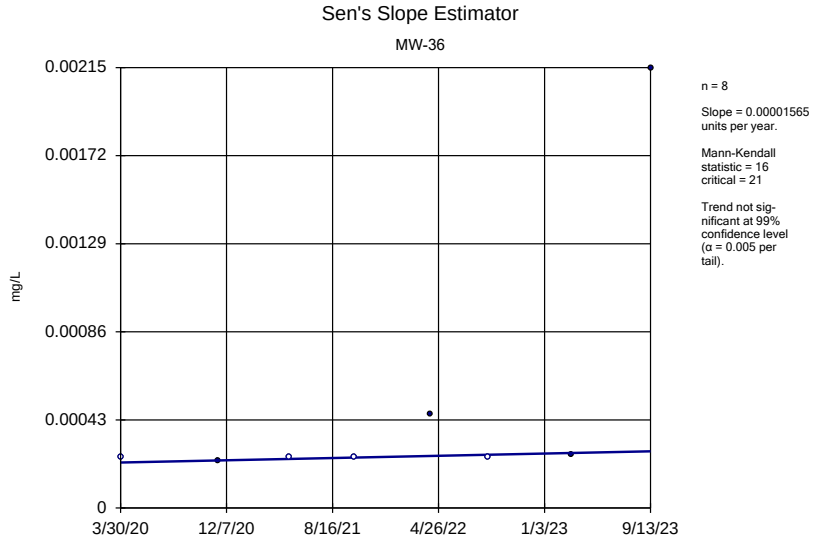
Constituent: Copper Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Constituent: Lead Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

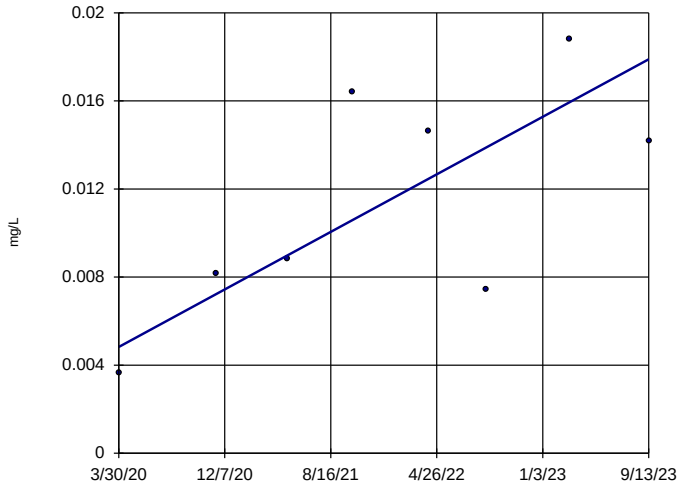


Constituent: Lead Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Sen's Slope Estimator

MW-11



n = 8

Slope = 0.003778 units per year.

Mann-Kendall statistic = 12 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

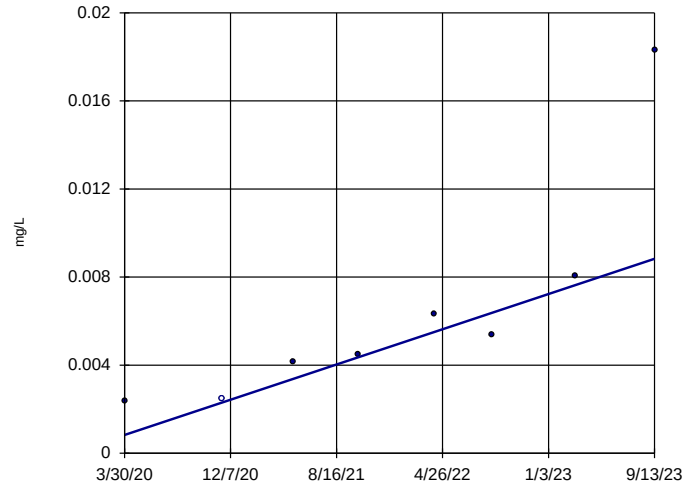
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0.002314 units per year.

Mann-Kendall statistic = 26 critical = 21

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Nickel Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

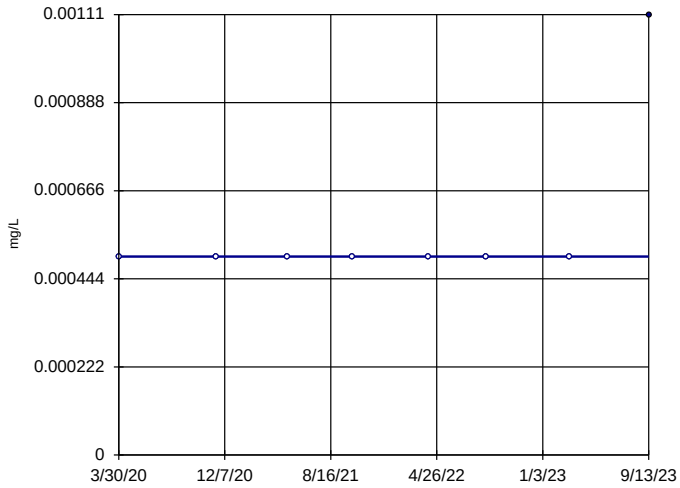
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-11



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Silver Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

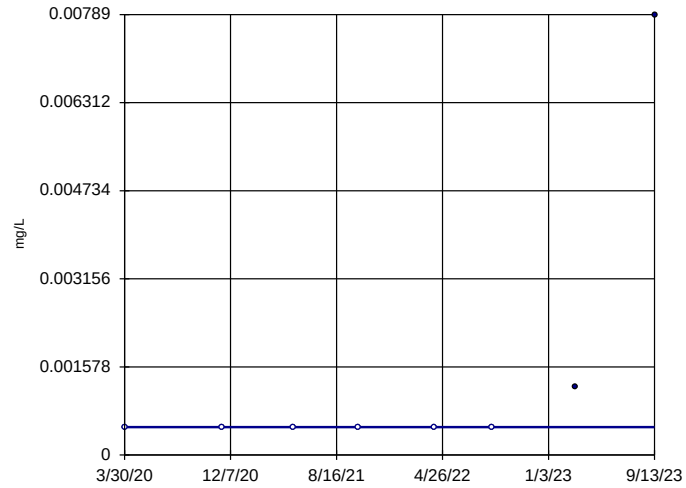
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-11



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 13 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

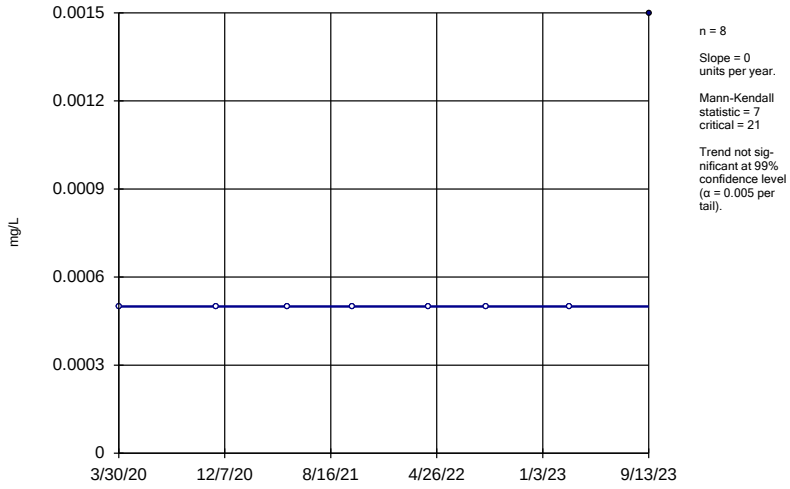
Constituent: Thallium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-23



n = 8

Slope = 0
units per year.

Mann-Kendall
statistic = 7
critical = 21

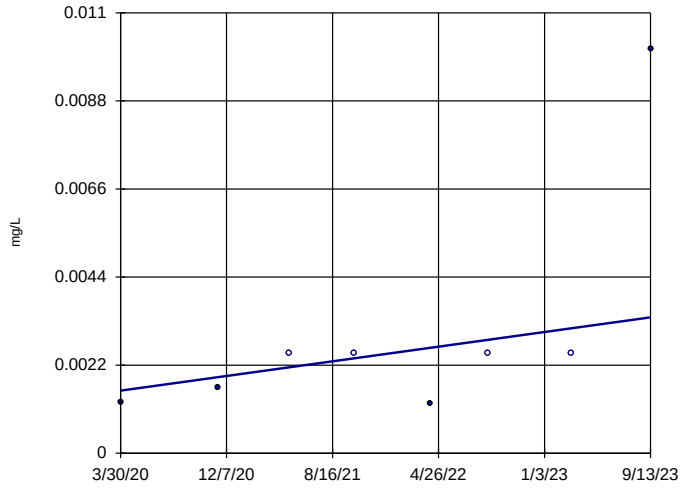
Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Thallium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-36



n = 8

Slope = 0.0005295
units per year.

Mann-Kendall
statistic = 14
critical = 21

Trend not sig-
nificant at 99%
confidence level
(α = 0.005 per
tail).

Constituent: Vanadium Analysis Run 10/18/2023 12:18 PM View: 2023AWQR - Mann Kendall
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Confidence Interval Summary Table and Graphs – Water Table

Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR Printed 10/19/2023, 11:16 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Arsenic (mg/L)	MW-21	0.00326	0.001459	0.01	No	8	0	No	0.01	Param.
Arsenic (mg/L)	MW-24	0.002308	0.0009454	0.01	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-19	1.268	1.082	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-21	1.229	0.8491	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-24	0.815	0.695	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-37R	0.9307	0.7581	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-39	0.1016	0.08401	2	No	8	0	No	0.01	Param.
Benzene (ug/L)	MW-19	0.9512	0.4613	5	No	8	12.5	No	0.01	Param.
Cadmium (mg/L)	MW-19	0.00204	0.00005	0.005	No	8	75	No	0.004	NP (NDs)
Cadmium (mg/L)	MW-24	0.0009331	0.0004036	0.005	No	6	0	No	0.01	Param.
Cadmium (mg/L)	MW-37R	0.0003827	0.0001232	0.005	No	8	0	No	0.01	Param.
Cadmium (mg/L)	MW-39	0.0002095	0.00005	0.005	No	8	62.5	No	0.004	NP (NDs)
Carbon Disulfide (ug/L)	MW-21	2.315	0.493	700	No	8	75	No	0.004	NP (NDs)
Chlorobenzene (ug/L)	MW-19	1.82	0.6033	100	No	8	12.5	No	0.01	Param.
Chlorobenzene (ug/L)	MW-24	1.23	0.3292	100	No	5	0	No	0.01	Param.
Cobalt (mg/L)	MW-19	0.02513	0.01781	0.04962	No	8	0	No	0.01	Param.
Cobalt (mg/L)	MW-21	0.005042	0.00167	0.04962	No	8	0	No	0.01	Param.
Cobalt (mg/L)	MW-24	0.004352	0.001243	0.04962	No	8	0	No	0.01	Param.
Cobalt (mg/L)	MW-37R	0.001808	0.0002667	0.04962	No	8	12.5	No	0.01	Param.
Cobalt (mg/L)	MW-38R	0.00317	0.000185	0.04962	No	8	0	No	0.004	NP (normality)
gamma-Chlordane (ug/L)	MW-19	1	0.0164	2	No	8	62.5	No	0.004	NP (NDs)
Lead (mg/L)	MW-37R	0.00281	0.000559	0.015	No	8	25	No	0.01	Param.
Lead (mg/L)	MW-38R	0.0005667	0.0002766	0.015	No	8	37.5	No	0.01	Param.
Lead (mg/L)	MW-39	0.0004855	0.00025	0.015	No	8	87.5	No	0.004	NP (NDs)
Nickel (mg/L)	MW-19	0.065	0.04931	0.1	No	8	0	No	0.01	Param.
Nickel (mg/L)	MW-21	0.006128	0.002052	0.1	No	8	12.5	No	0.01	Param.
Nickel (mg/L)	MW-24	0.0323	0.00272	0.1	No	8	0	No	0.004	NP (normality)
Nickel (mg/L)	MW-37R	0.01066	0.004671	0.1	No	8	0	No	0.01	Param.
Nickel (mg/L)	MW-38R	0.009336	0.003664	0.1	No	8	0	No	0.01	Param.
Selenium (mg/L)	MW-37R	0.0558	0.00458	0.05	No	8	0	No	0.004	NP (normality)
Selenium (mg/L)	MW-38R	0.02213	-0.0005102	0.05	No	8	37.5	No	0.01	Param.
Selenium (mg/L)	**MW-39**	**0.08024**	**0.0729**	**0.05**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Sulfide (mg/L)	MW-21	2.02	0.5	1	No	8	50	No	0.004	NP (normality)
Thallium (mg/L)	MW-39	0.003065	0.0005	0.002	No	8	87.5	No	0.004	NP (NDs)
Toluene (ug/L)	MW-21	301.5	0.5	1000	No	8	87.5	No	0.004	NP (NDs)
Toluene (ug/L)	MW-37R	1.21	0.5	1000	No	8	87.5	No	0.004	NP (NDs)
Toluene (ug/L)	MW-38R	2.12	0.5	1000	No	8	75	No	0.004	NP (NDs)
Vanadium (mg/L)	MW-37R	0.005942	0.0007812	0.035	No	8	0	No	0.01	Param.
Vanadium (mg/L)	MW-39	0.00381	0.001151	0.035	No	8	75	No	0.004	NP (NDs)
Xylenes, total (ug/L)	MW-37R	5.25	1.5	10000	No	8	87.5	No	0.004	NP (NDs)
Xylenes, total (ug/L)	MW-38R	10.2	0.461	10000	No	8	75	No	0.004	NP (NDs)

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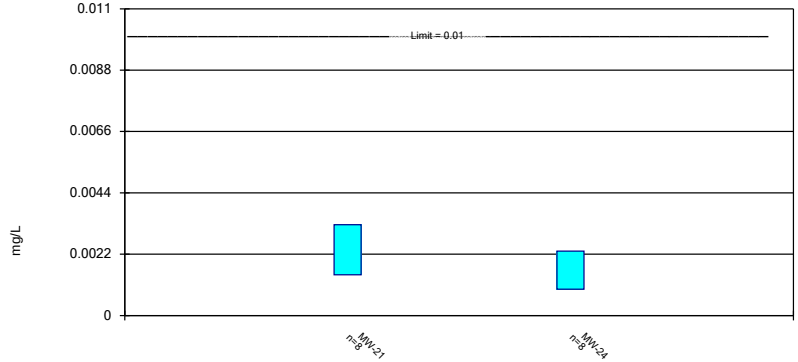
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Arsenic Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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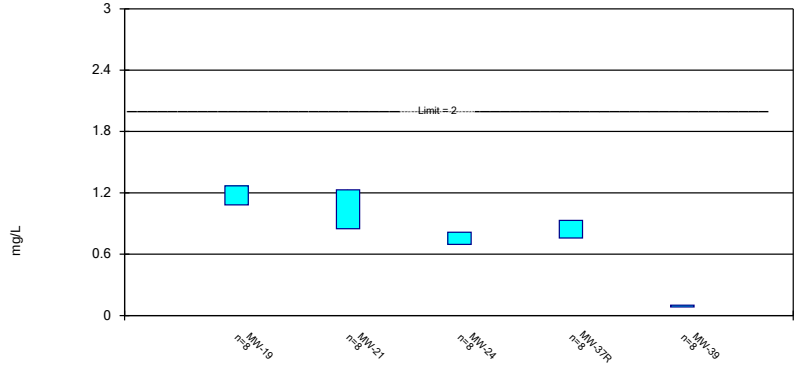
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Barium Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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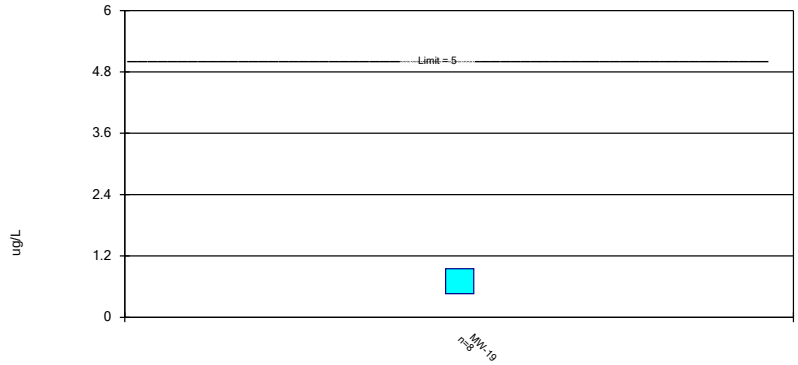
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Benzene Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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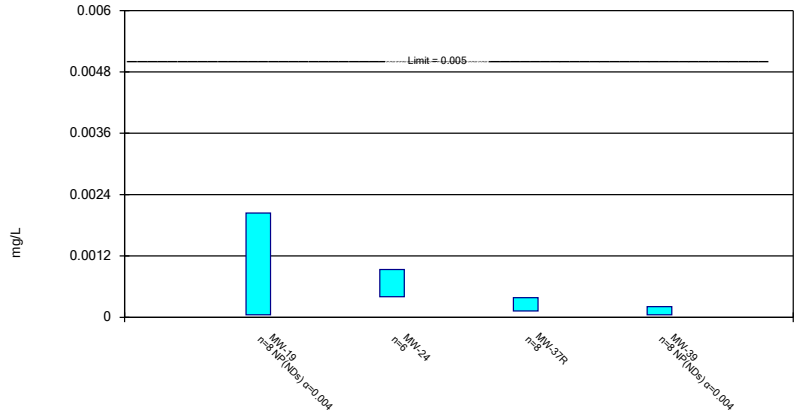
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cadmium Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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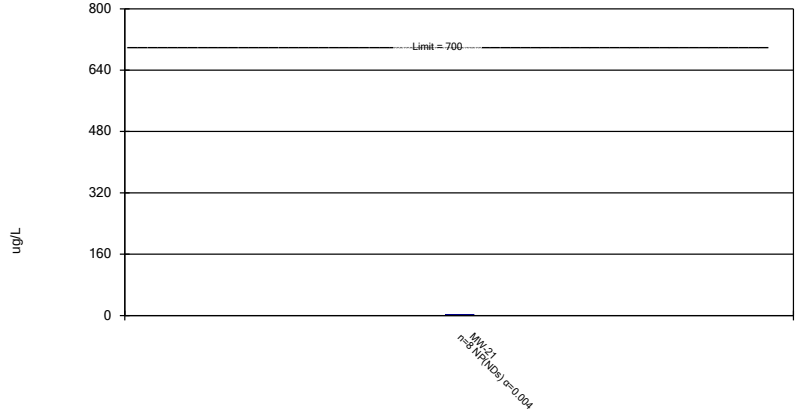
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Carbon Disulfide Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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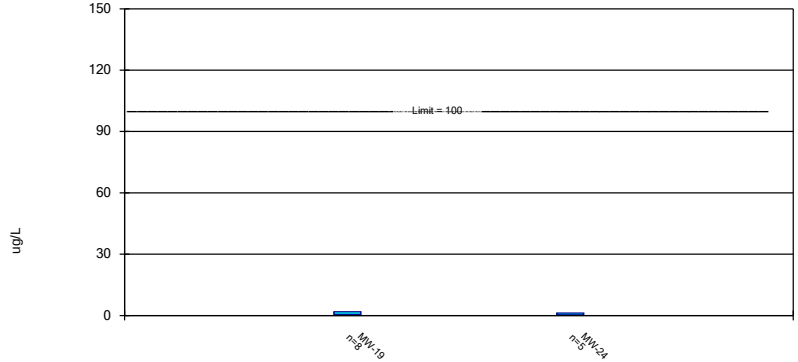
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Chlorobenzene Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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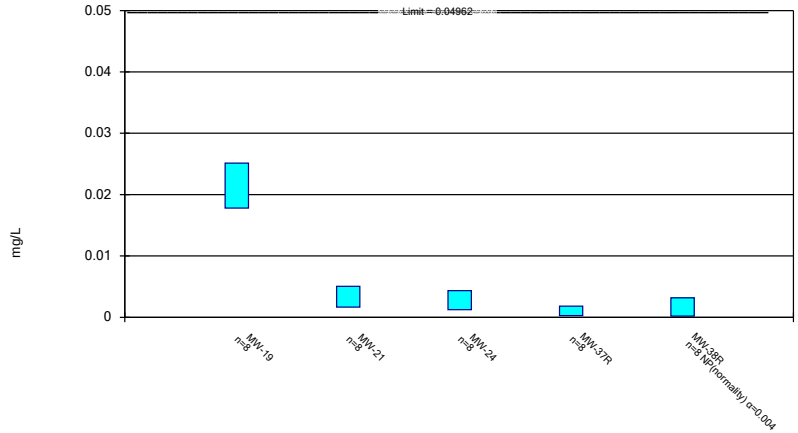
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cobalt Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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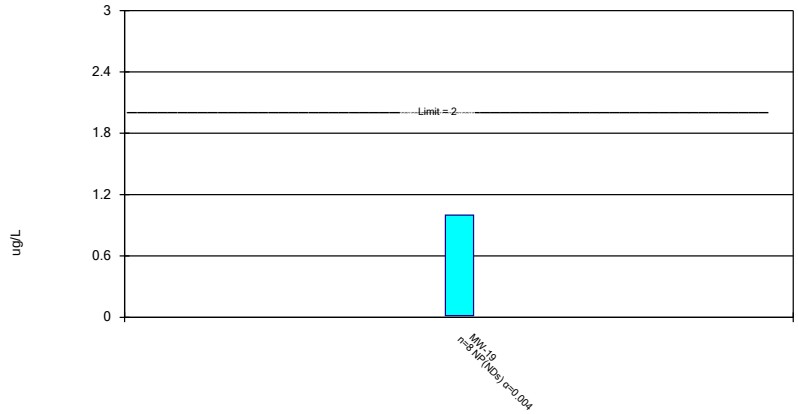
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: gamma-Chlordane Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interv
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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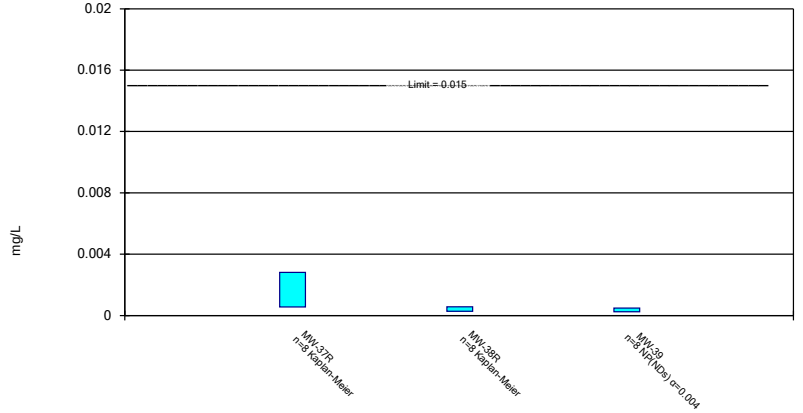
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Lead Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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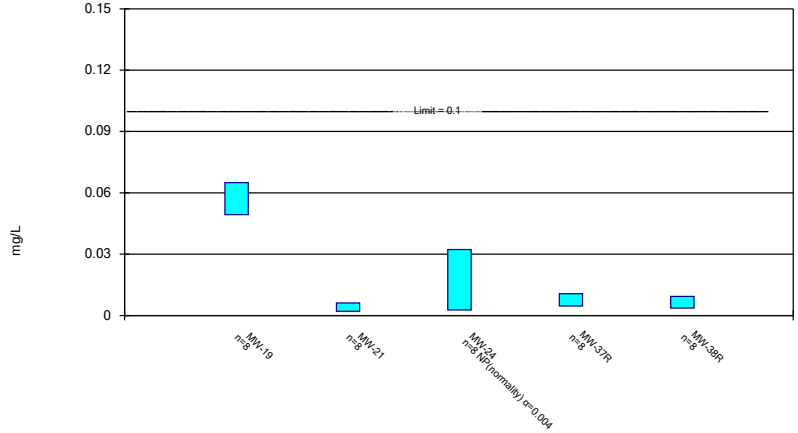
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



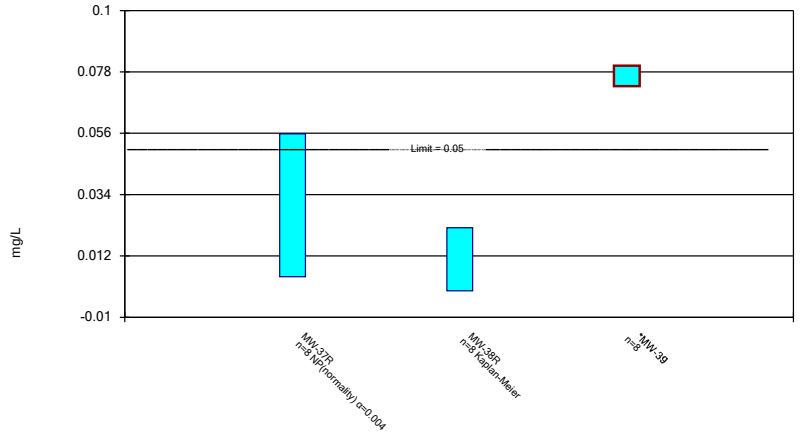
Constituent: Nickel Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Selenium Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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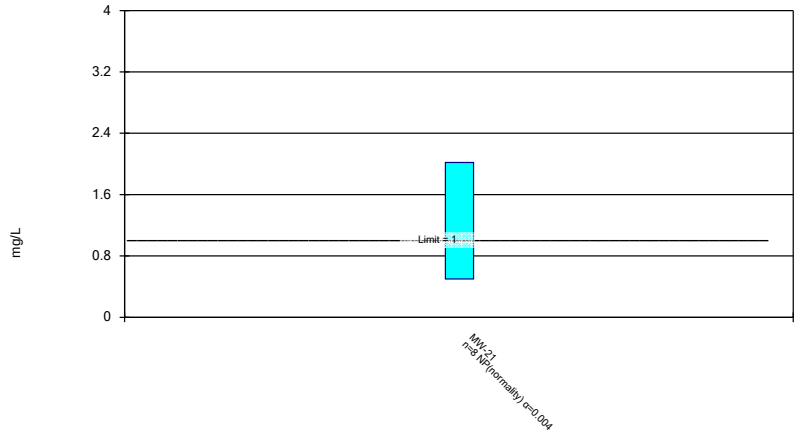
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Sulfide Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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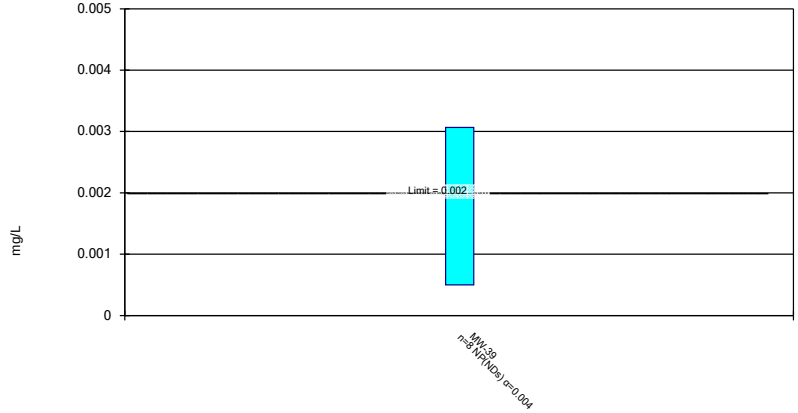
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Thallium Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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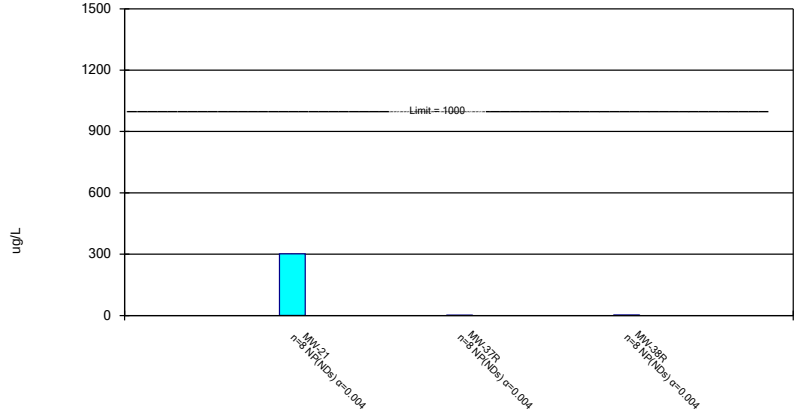
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Toluene Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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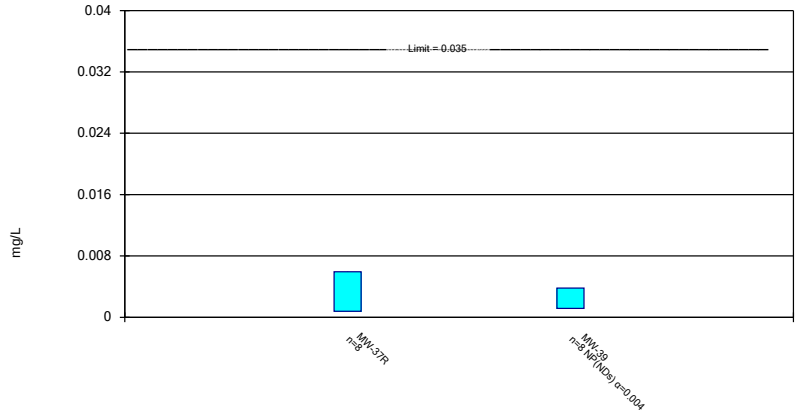
Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Vanadium Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

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Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

Constituent: Xylenes, total Analysis Run 10/19/2023 11:15 AM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Confidence Interval Summary Table and Graphs – Dakota Sandstone

Confidence Interval

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM Printed 10/18/2023, 12:36 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-36	0.00183	0.0005	0.007449	No	8	87.5	No	0.004	NP (NDs)
Arsenic (mg/L)	MW-11	0.01269	0.001732	0.01	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-11	0.6547	0.3935	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-23	0.1602	0.1361	2	No	8	0	No	0.01	Param.
Barium (mg/L)	MW-36	0.2447	0.1111	2	No	8	0	No	0.01	Param.
Cadmium (mg/L)	MW-11	0.0001957	0.00005819	0.005	No	8	37.5	No	0.01	Param.
Cadmium (mg/L)	MW-36	0.000559	0.00004897	0.005	No	8	12.5	No	0.01	Param.
Cobalt (mg/L)	**MW-11**	**0.0138**	**0.005927**	**0.003981**	**Yes**	**8**	**0**	**No**	**0.01**	**Param.**
Cobalt (mg/L)	MW-36	0.002939	0.0004985	0.003981	No	8	12.5	No	0.01	Param.
Copper (mg/L)	MW-36	0.00878	0.0025	1.3	No	8	75	No	0.004	NP (NDs)
Lead (mg/L)	MW-11	0.000589	0.00025	0.015	No	8	75	No	0.004	NP (NDs)
Lead (mg/L)	MW-36	0.00215	0.000233	0.015	No	8	50	No	0.004	NP (normality)
Nickel (mg/L)	MW-11	0.01705	0.005988	0.1	No	8	0	No	0.01	Param.
Silver (mg/L)	MW-11	0.00111	0.0005	0.1	No	8	87.5	No	0.004	NP (NDs)
Thallium (mg/L)	MW-11	0.00789	0.0005	0.002	No	8	75	No	0.004	NP (NDs)
Thallium (mg/L)	MW-23	0.0015	0.0005	0.002	No	8	87.5	No	0.004	NP (NDs)
Vanadium (mg/L)	MW-36	0.0101	0.00124	0.035	No	8	50	No	0.004	NP (normality)

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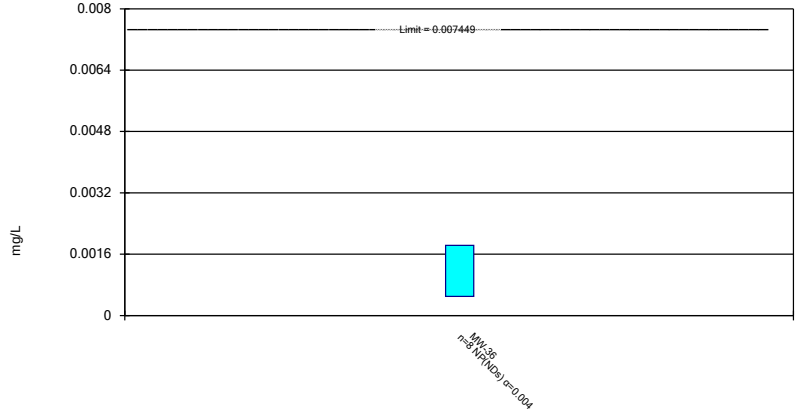
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Antimony Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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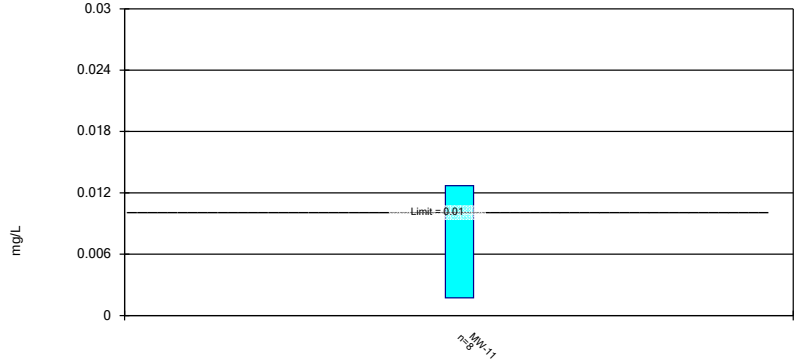
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Arsenic Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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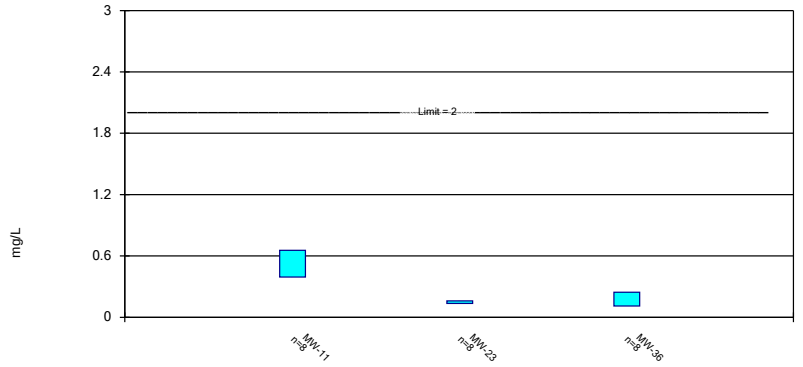
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Barium Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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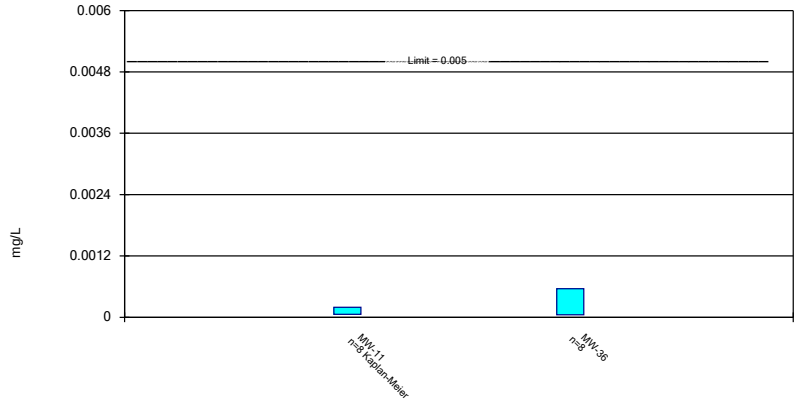
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cadmium Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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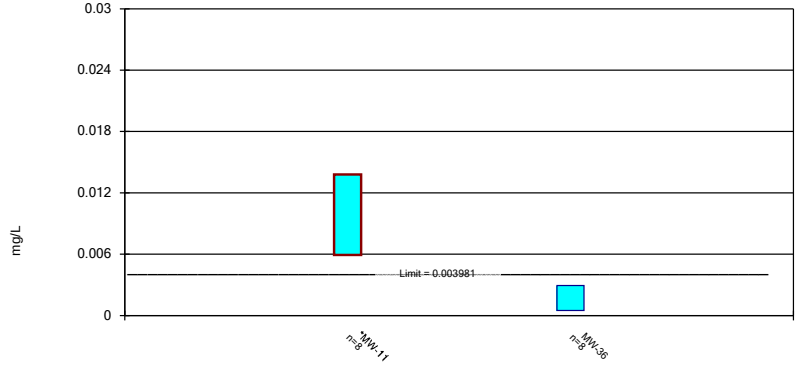
Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Cobalt Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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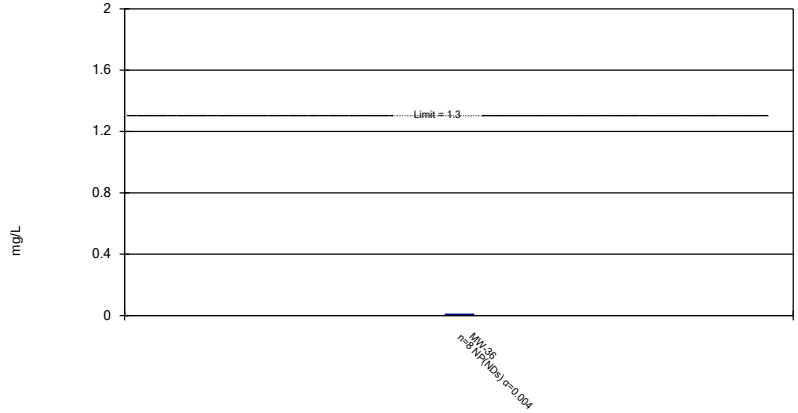
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Copper Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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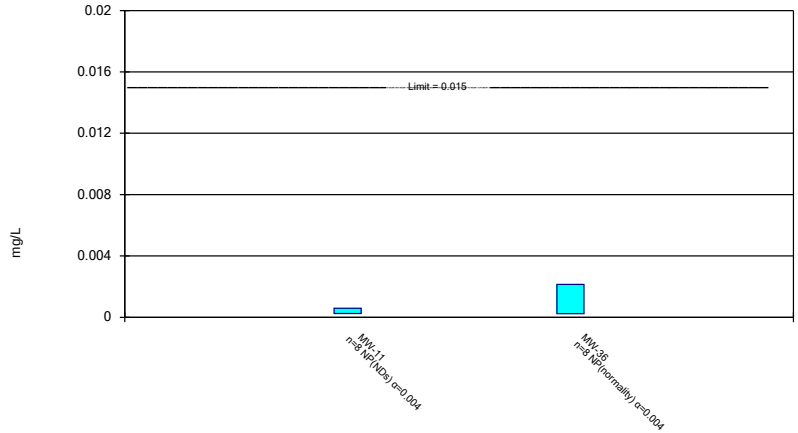
Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Lead Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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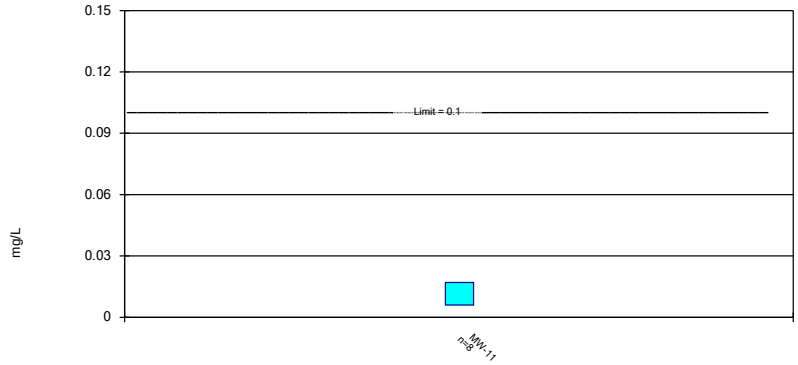
Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk at Alpha = 0.01.



Constituent: Nickel Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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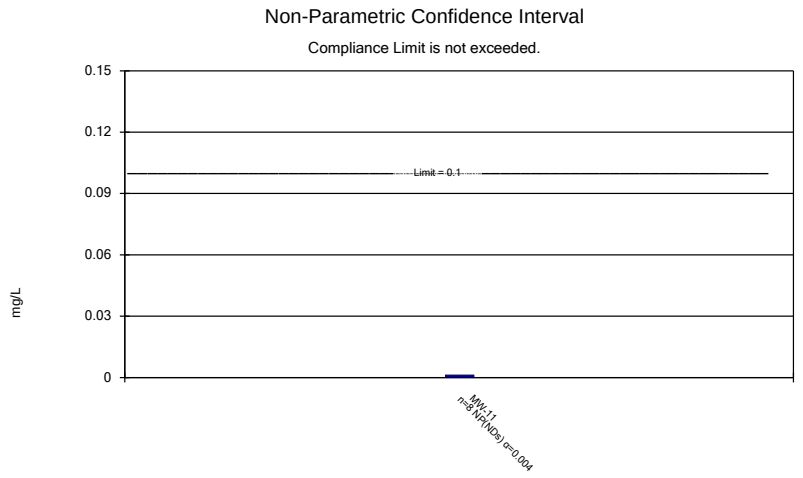

Constituent: Silver Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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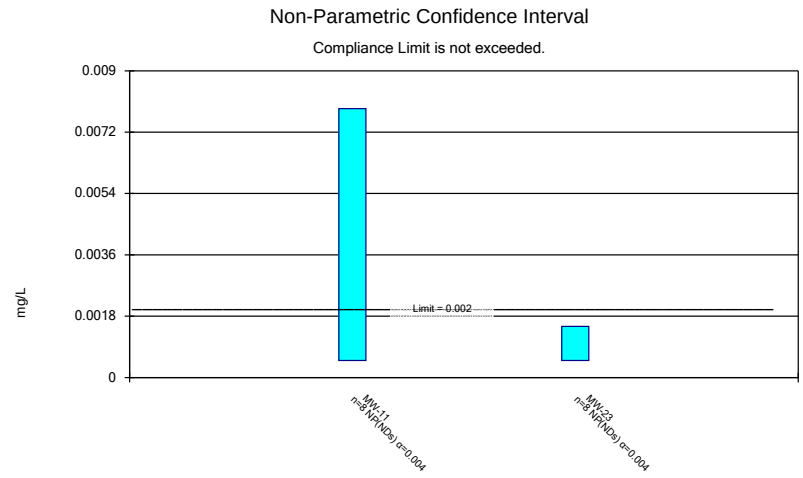

Constituent: Thallium Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

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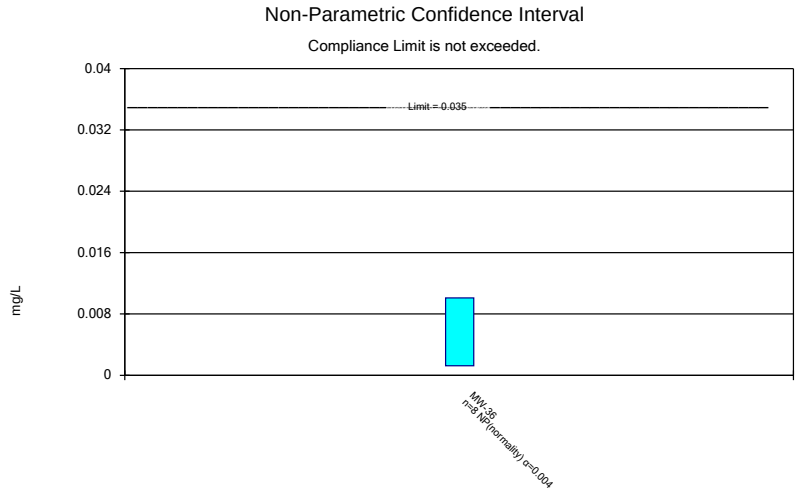

Constituent: Vanadium Analysis Run 10/18/2023 12:34 PM View: 2023AWQR - Confidence Interval
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Theil-Sen Confidence Bands Summary Table and Graphs – Water Table

Theil Sen/Trend Test

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR Printed 10/19/2023, 11:20 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Barium (mg/L)	**MW-38R**	**-0.1415**	**-26**	**-21**	**Yes**	**8**	**0**	**0.01**	**NP**
Cadmium (mg/L)	**MW-38R**	**-0.00009238**	**-22**	**-21**	**Yes**	**8**	**12.5**	**0.01**	**NP**

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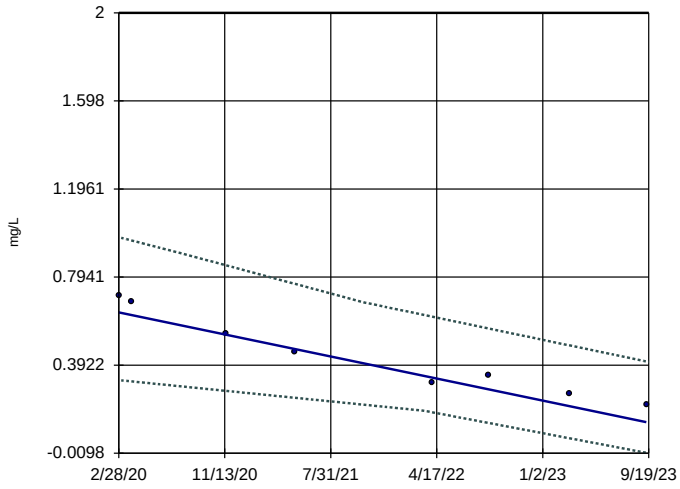
Sen's Slope and 99% Confidence Band

MW-38R



n = 8

Slope = -0.1415 units per year.

Mann-Kendall statistic = -26 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Confidence band is below GWPS mg/L (2).

Constituent: Barium Analysis Run 10/19/2023 11:19 AM View: 2023AWQR - Theil Sen

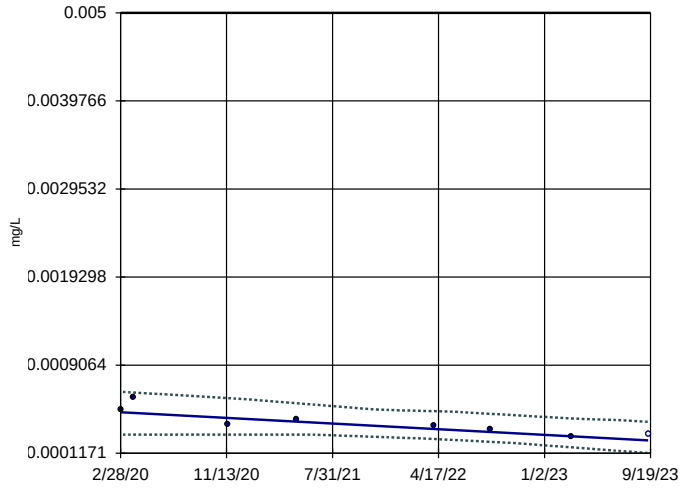
Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG

Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-38R



n = 8

Slope = -0.00009238 units per year.

Mann-Kendall statistic = -22 critical = -21

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Confidence band is below GWPS mg/L (0.005).

Constituent: Cadmium Analysis Run 10/19/2023 11:19 AM View: 2023AWQR - Theil Sen

Cass County SLF Client: SCS Engineers Consulting Data: CASS WT-AM 2023AWQR

Theil-Sen Confidence Bands Summary Table and Graphs – Dakota Sandstone

Theil Sen/Trend Test

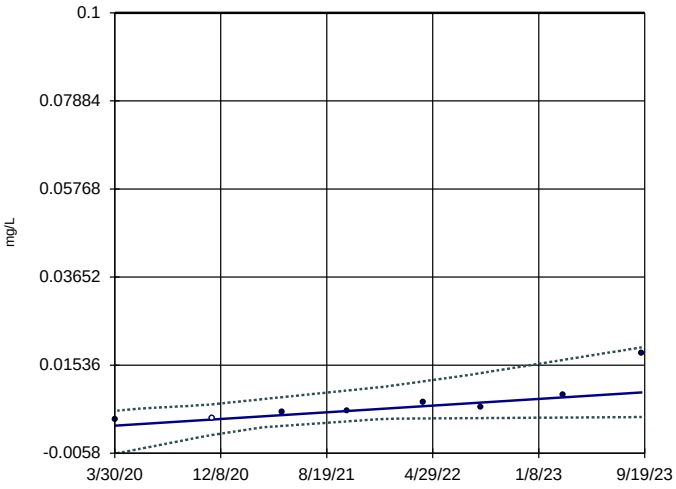
Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM Printed 10/18/2023, 12:40 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Alpha	Method
Nickel (mg/L)	**MW-36**	**0.002314**	**26**	**21**	**Yes**	**8**	**12.5**	**0.01**	**NP**

Sanitas™ v.10.0.08 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Sen's Slope and 99% Confidence Band

MW-36



n = 8

Slope = 0.002314 units per year.

Mann-Kendall statistic = 26 critical = 21

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Confidence band is below GWPS mg/L (0.1).

Constituent: Nickel Analysis Run 10/18/2023 12:39 PM View: 2023AWQR - Theil Sen

Cass County SLF Client: SCS Engineers Consulting Data: Sanitas Cass DS-AM

Appendix E

2023 Leachate Control System Performance Evaluation Report

2023 Leachate Control System Performance Evaluation Report

Cass County Sanitary Landfill
Atlantic, Iowa

Prepared for:

Cass County Environmental Control Agency
65928 Jackson Road
Atlantic, Iowa 50022

SCS ENGINEERS

27223098.24 | February 29, 2024

1690 All-State Court, Suite 100
West Des Moines, IA 50265
515-631-6160

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1.0 DESCRIPTION OF EXISTING LEACHATE CONTROL SYSTEM

SCS Engineers (SCS), on behalf of the Cass County Environmental Control Agency (Agency), has prepared this Leachate Control System Performance Evaluation Report (LCSPER) for the municipal solid waste landfill (MSWLF) unit at the Cass County Landfill (Landfill). This LCSPER was prepared in general accordance with the requirements of Iowa Administrative Code (IAC) 567-113.7(5)"b"(14) and additional Iowa Department of Natural Resources (DNR) requirements specified in the Landfill's operating permit and applicable permit amendments. This LCSPER describes the leachate control system, discusses maintenance activities, provides an evaluation of the effectiveness of the system, and, if necessary, makes recommendations for additional control measures. The reporting period of this report is January to December 2023.

1.1 LOCATION OF CONTROL SYSTEM

The Landfill property is depicted on **Figure 1**, Leachate Control System. The Landfill property consists of approximately 90 acres and is located along Jackson Road, four miles southeast of Atlantic in Cass County, Iowa, and is located within the NE ¼; SE ¼, SE ¼ and Lot 4 in the SE ¼, SE ¼, NE ¼; SE ¼, and all that part E ½, SE ¼; NE ¼ lying south of the creek, also that part of Lot 1 of Lot 5 lying North and East of the pubic highway in SE ¼, Section 13, Township 76 North, Range 36 West; and N ½ SW FR ¼, Section 18, Township 76 North, Range 35 West in Cass County, Iowa.

There is no leachate collection system in the unlined North Area of the Cass County MSWLF unit. The monitoring system consists of eight leachate piezometers, PZ-1R, PZ-2, PZ-3R, PZ-4, PZ-5R, PZ-6, PZ-7, and PZ-8, as shown on **Figure 1**.

The South Area consists of the Phase 0, 1, and 2 cells. The bottom liner and leachate collection system for the Phase 0, 1, and 2 Cells consist of a two-foot-thick layer of clay compacted to a permeability of $1x10^{-7}$ cm/sec or less, overlain with a geomembrane liner, overlain with a geocomposite drainage layer, and overlain with a protective layer of sand. The liner and leachate collection system of each cell slope toward the center of the cell, where a perforated pipe surrounded with drainage media collects the leachate and conveys it to the west cell boundary, where the pipe transitions to a solid pipe and conveys the leachate into the leachate lagoon located west of the current working area (see **Figure 1**). Shut-off valves on the west side and cleanouts at the east and west ends of the leachate collection pipes were installed for each cell.

Leachate piezometer LPZ-0 was installed on top of the bottom liner at the downgradient end of the Phase 0 Cell. LPZ-1 and LPZ-2 were installed as leachate sump piezometers and are located at the west end of the Phase 1 and 2 cells, respectively. Requirements of IAC include maintenance of 12 inches or less of fluid head above liners and leachate collection systems (Phase 0, 1, and 2 Cells).

Leachate recirculation occurs through two injection trenches located in the Phase 0 cell and abutment via a force main from a solar-powered pump in the lagoon. No leachate recirculation occurred during the reporting period.

1.2 EFFECTIVENESS OF LEACHATE SYSTEM IN ATTAINING MINIMUM ACHIEVABLE LEVELS

Monthly head levels and leachate disposal volumes are included in **Table E-1** included as Attachment A. Historical leachate column thicknesses are summarized in **Table E-2** included as **Appendix A**. The Cass County Sanitary Landfill MSWLF unit is required to maintain leachate head

levels less than 12 inches over the liner. The leachate piezometers LPZ-0, LPZ-1, and LPZ-2 were consistently reported as dry during this reporting period and were therefore within the compliance limit of 12 inches.

The following discussions address the Cass County Sanitary Landfill MSWLF unit leachate piezometers in unlined cells.

PZ-1R

Measurements were within the historical range.

PZ-2

Measurements were within the historical range.

PZ-3R

Measurements were within the historical range.

PZ-4

Measurements were within the historical range.

PZ-5R

Measurements were within the historical range.

PZ-6

Measurements were within the historical range.

PZ-7

Measurements were within the historical range.

PZ-8

Measurements were repeatedly lower than the historical average during the 2023 reporting period. The November measurement was below the historical range.

1.3 APPROVED POTW UTILIZATION

The Cass County Environmental Control Agency has established a leachate treatment agreement with the City of Atlantic Publicly Owned Treatment Works (POTW). As seen in **Table E-1**, approximately 154,910 gallons of leachate were hauled to the City of Atlantic POTW during this reporting period. The annual leachate sample was collected on October 3, 2023, by SCS Engineers and analytical data is included in **Appendix B**.

1.4 APPROVED CHANGES TO SYSTEM

There were no changes made to the leachate control system during this reporting period.

1.5 PROPOSED CHANGES TO SYSTEM

No changes are proposed to the system during the upcoming reporting period. SCS recommends the following for continuance of leachate management at the Landfill:

- Maintain integrity of the final cover.
- Continue operation and maintenance of the leachate control system in accordance with the approved Leachate Control System Plan.
- Continue monthly measurements of leachate head levels and total depth measurements of each piezometer in the leachate control system. It is also recommended to check and repair, if necessary, the liquid level tape sensitivity and verify piezometer total depths to limit erroneous measurements.
- Continue to monitor the flow meter and record the volume of leachate recirculated via force main to the leachate injection trench in the South Area.
- Continue to record the volume of leachate hauled and treated at the City of Atlantic and/or the City of Corning publicly-owned treatment works.

Continue to clean the leachate collection system once every three years or more frequently if leachate head or the volume of leachate collected indicates cleanout is necessary.

Attachment A

Table E-1
Leachate Management Summary
2023 Leachate Collection System Performance Evaluation Report
Cass County Sanitary Landfill
Permit No. 15-SDP-01-75P

Month	Lined Cells - Maximum Head on Liner (ft)			Unlined Cells - Column Thickness (ft)								Volume Recirculated (gal)	Hauled to City of Atlantic POTW (gal)	Precipitation (in)
	LPZ-0	LPZ-1	LPZ-2	PZ-1R	PZ-2	PZ-3R	PZ-4	PZ-5R	PZ-6	PZ-7	PZ-8			
January 2023	Dry	Dry	Dry	Dry	ME	15.90	1.40	2.70	14.50	21	12.70			1.04
February 2023	Dry	Dry	Dry	Dry	Dry	15.50	1.30	3.10	14.70	22	12.90			2.00
March 2023	Dry	Dry	Dry	Dry	Dry	16.10	1.40	3.80	13.90	21	13.60			1.02
April 2023	Dry	Dry	Dry	Dry	Dry	15.70	1.80	2.90	16.80	21	13.70			2.34
May 2023	Dry	Dry	Dry	Dry	Dry	15.50	1.70	2.70	15.00	22	20.50			1.12
June 2023	Dry	Dry	Dry	Dry	Dry	13.10	Dry	1.60	7.00	21	13.50			2.86
July 2023	Dry	ME	Dry	Dry	0.80	13.40	Dry	1.90	6.10	21	12.60			2.65
August 2023	Dry	Dry	Dry	Dry	0.90	13.20	Dry	1.70	6.60	22	12.30			4.85
September 2023	Dry	Dry	Dry	2.40	Dry	15.40	Dry	1.60	6.20	21	12.50			1.82
October 2023	Dry	Dry	Dry	Dry	Dry	16.40	Dry	2.60	7.20	21	12.00			1.32
November 2023	Dry	Dry	Dry	Dry	Dry	0.90	Dry	2.10	5.60	21	8.80			0.14
December 2023	Dry	Dry	Dry	Dry	Dry	16.30	Dry	2.60	Dry	21	11.90			1.48
Reporting Period Total												**0**	**154,910**	**22.64**

Notes:

1) Leachate column thicknesses for the reporting period generally remained consistent with historical measurements.
2) Historical leachate levels and graphs are provided in Appendix A.
3) Precipitation data obtained from https://mesonet.agron.iastate.edu/ASOS/reports/mon_prec.php?year=2023 for Atlantic, Iowa.
4) The storage capacity of the leachate lagoon is approximately 629,000 gallons at the operational level (two feet of freeboard).
5) The operating permit issued December 5, 2016 requires monthly leachate head level and elevation measurements.
6) The operating permit issued December 5, 2016 requires the permit holder to record the volume of leachate colected and transported to the treatment works.
7) ME = Measurement Error. Equipment sensitivity likely led to erroneous data.

Comments:

Reporting Period: January 2023 - December 2023.
Approved Changes to Leachate Collection System: None.
Proposed Changes to Leachate Collection System: None.
Maintenance Performed on Leachate Collection System: None.
Last Date of Cleaning and Inspection: June 2021.
Date of Next Cleaning and Inspection: Leachate line cleaning and inspection will be performed in Spring 2024.
Volume of Leachate Recirculated: There was no leachate recirculated during this reporting period.
Volume of Leachate Treated Off-Site: 154,910 gallons were hauled to the City of Atlantic POTW during the reporting period.
Leachate Quality Testing Results: Leachate quality testing results for the reporting period are provided in Appendix B.

Figures

Leachate Control System

Figure 1

SCS ENGINEERS
environmental consultants and contractors

Legend

- Approximate Leachate Monitoring Location
- Leachate Piping
- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

N
W E
S

0 255 510 1,020 Feet

GEODATA: Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, USGS

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User: bmadson
Date Saved: 12/29/2023 10:28 AM

Appendix A

Historical Leachate Column Thicknesses

Table E-2
Historical Leachate Column Thicknesses
2023 Leachate Collection System Performance Evaluation Report
Cass County Sanitary Landfill
Permit No. 15-SDP-01-75P

Date	LEACHATE COLUMN THICKNESS										
	LPZ-0	LPZ-1	LPZ-2[3,8]	PZ-1R	PZ-2	PZ-3R [2]	PZ-4	PZ-5R	PZ-6	PZ-7	PZ-8
TOC	151.00	151.00	117.22	83.13	147.30	109.60	150.00	111.78	111.34	133.90	133.29
Constructed Depth	9.00	NM	NM	37.00	55.00	13.44	44.43	47.94	50.00	55.00	58.00
Measured Depth (6/24/2009)	38.00	10.00	12.75	42.30	35.00	50.00	31.50	54.00	NA	NA	NA
3/6/2006					17.20	Dry	Dry				
9/12/2006					16.60	Dry	Dry				
3/29/2007					15.80		11.93				
9/28/2007					Dry		Dry				
4/29/2008	Dry				Dry	Dry	Dry				
9/11/2008	Dry				Dry	Dry	Dry				
3/3/2009				Dry	Dry	Dry	Dry	7.79			
8/21/2009				Dry	Dry	22.7	Dry	9.24			
9/24/2009	2.0	0.8		Dry	Dry	22.0	Dry	6.8			
10/27/2009	2.0	1.0		Dry	Dry	21.5	Dry	8.2			
11/24/2009	Dry	0.8		Dry	Dry	21.3	Dry	11.5			
12/17/2009	Dry	Dry		Dry	Dry	20.8	Dry	6.5			
1/27/2010	[1]	0.2		Dry	Dry	20.8	Dry	6.5			
2/23/2010	[1]	0.3		Dry	Dry	20.8	Dry	8.0			
3/30/2010	[1]	0.2		Dry	Dry	20.8	Dry	9.0			
4/27/2010	Dry	2.0		Dry	Dry	21.0	Dry	8.8			
5/26/2010	Dry	2.0		Dry	Dry	21.4	Dry	11.0			
6/25/2010	Dry	2.8		Dry	Dry	21.6	Dry	11.5			
7/28/2010	Dry	2.0		Dry	Dry	21.6	Dry	11.4			
8/13/2010	Dry	1.0		Dry	Dry	21.5	Dry	11.4			
9/17/2010	Dry	1.0		Dry	Dry	21.5	Dry	11.5			
10/15/2010	Dry	0.2		Dry	Dry	21.3	Dry	11.5			
11/23/2010	Dry	0.0		Dry	Dry	21.0	Dry	10.0			
12/16/2010	Dry	0.2		Dry	Dry	21.4	Dry	10.0			
1/13/2011	Dry	0.2		Dry	Dry	21.0	Dry	10.2			
2/24/2011	Dry	0.2		Dry	Dry	21.0	Dry	10.0			
3/17/2011	Dry	0.0		Dry	Dry	20.5	Dry	9.0			
4/12/2011	Dry	0.0		Dry	Dry	20.9	Dry	10.0			
5/18/2011	Dry	0.0		Dry	Dry	20.6	Dry	10.6			
6/16/2011	Dry	Dry		Dry	Dry	20.2	Dry	9.3			
7/14/2011	Dry	Dry		Dry	Dry	20.2	Dry	9.3			
8/24/2011	Dry	Dry		Dry	Dry	20.4	Dry	9.5			
9/14/2011	Dry	Dry		Dry	Dry	22.2	Dry	9.4			
10/18/2011	Dry	Dry		Dry	Dry	20.4	Dry	9.5			
11/10/2011	Dry	Dry		Dry	Dry	20.3	Dry	9.4			
12/7/2011	Dry	Dry		Dry	Dry	20.4	Dry	9.5			
1/24/2012	Dry	Dry		Dry	Dry	19.8	Dry	7.7			
2/14/2012	Dry	Dry		Dry	Dry	20.2	Dry	8.0			
3/27/2012	Dry	Dry		Dry	Dry	19.4	Dry	7.5			
4/19/2012	Dry	Dry		Dry	Dry	19.4	Dry	7.5			
5/14/2012	Dry	Dry		Dry	Dry	19.2	Dry	7.3			
6/12/2012	Dry	Dry		Dry	Dry	20.4	Dry	7.1			
7/18/2012	Dry	Dry	Dry	Dry	Dry	19.8	Dry	6.8			
8/16/2012	Dry	Dry	Dry	Dry	Dry	19.4	Dry	6.7			
9/17/2012	Dry	Dry	Dry	Dry	Dry	19.5	Dry	6.9			
10/15/2012	Dry	Dry	Dry	Dry	Dry	19.2	Dry	6.9			
11/21/2012	Dry	Dry	Dry	Dry	Dry	19.1	Dry	6.9			
12/18/2012	Dry	Dry	Dry	Dry	Dry	19.8	Dry	6.3			

Table E-2
Historical Leachate Column Thicknesses
2023 Leachate Collection System Performance Evaluation Report
Cass County Sanitary Landfill
Permit No. 15-SDP-01-75P

Date	LEACHATE COLUMN THICKNESS										
	LPZ-0	LPZ-1	LPZ-2[3,8]	PZ-1R	PZ-2	PZ-3R [2]	PZ-4	PZ-5R	PZ-6	PZ-7	PZ-8
TOC	151.00	151.00	117.22	83.13	147.30	109.60	150.00	111.78	111.34	133.90	133.29
Constructed Depth	9.00	NM	NM	37.00	55.00	13.44	44.43	47.94	50.00	55.00	58.00
Measured Depth (6/24/2009)	38.00	10.00	12.75	42.30	35.00	50.00	31.50	54.00	NA	NA	NA
1/25/2013	Dry	Dry	Dry	Dry	Dry	19.8	Dry	Dry			
2/12/2013	Dry	Dry	Dry	Dry	Dry	19.8	Dry	6.3			
3/26/2013	Dry	Dry	Dry	Dry	Dry	19.7	Dry	6.5			
4/5/2013	Dry	Dry	Dry	Dry	Dry	19.7	Dry	6.5			
5/9/2013	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.4			
6/20/2013	Dry	Dry	Dry	Dry	Dry	18.9	0.6	6.4			
7/22/2013	Dry	Dry	Dry	Dry	Dry	18.9	0.7	6.4			
8/1/2013	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.4			
9/24/2013	Dry	Dry	Dry	Dry	Dry	19.0	Dry	6.1			
10/17/2013	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.1			
11/18/2013	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.1			
12/3/2013	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.5			
1/22/2014	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.1			
2/10/2014	Dry	Dry	Dry	Dry	Dry	18.9	Dry	6.1			
3/11/2014	Dry	Dry	Dry	Dry	Dry	19.0	Dry	6.1			
4/19/2014	Dry	Dry	Dry	Dry	Dry	19.0	Dry	6.0			
5/20/2014	Dry	Dry	Dry	Dry	Dry	18.8	Dry	6.0			
6/24/2014		Dry	Dry	Dry	Dry	19.0	Dry	6.0			
7/14/2014		Dry	Dry	Dry	Dry	19.2	Dry	6.0			
8/12/2014		Dry	Dry	Dry	Dry	19.6	Dry	6.0			
9/17/2014		Dry	Dry	Dry	Dry	19.6	Dry	6.0			
10/21/2014		Dry	Dry	Dry	Dry	20.9	Dry	5.7			
11/25/2014		Dry	Dry	Dry	Dry	20.6	Dry	5.7			
12/12/2014		Dry	Dry	Dry	Dry	20.7	Dry	5.7			
1/22/2015		Dry	Dry	Dry	Dry	20.6	Dry	5.5			
2/24/2015		Dry	Dry	Dry	Dry	20.6	Dry	5.5			
3/24/2015		Dry	Dry	Dry	Dry	20.6	Dry	5.5			
4/16/2015		Dry	Dry	Dry	Dry	20.5	Dry	5.5			
5/21/2015		Dry	Dry	Dry	Dry	20.6	Dry	5.5			
10/21/2015		Dry	Dry	Dry	Dry	20.4	Dry	5.6	16.2	22.7	15.5
11/16/2015	0.4	Dry	Dry	1.3	Dry	19.6	Dry	5.7	17.9	23.1	15.4
12/8/2015	0.8	Dry	Dry	2.3	Dry	Dry	Dry	5.6	19.1	24.8	15.8
1/18/2016	0.7	Dry	Dry	1.2	Dry	19.9	1.8	5.5	18.0	22.9	15.2
2/20/2016	0.4	Dry	Dry	1.3	Dry	19.3	1.7	5.2	15.0	23.0	15.1
3/22/2016	0.3	Dry	Dry	1.4	Dry	19.5	1.4	5.3	16.0	22.9	15.8
4/21/2016	0.4	Dry	Dry	1.3	Dry	19.5	Dry	5.3	16.0	22.0	15.7
5/19/2016	0.2	Dry	Dry	1.4	Dry	19.3	Dry	5.3	16.0	19.0	14.2
6/30/2016	0.3	Dry	Dry	1.4	Dry	17.1	Dry	4.5	19.9	21.3	13.6
7/26/2016	0.2	Dry	Dry	1.3	Dry	19.2	Dry	5.3	16.1	22.5	15.0
8/29/2016	0.6	Dry	Dry	1.3	Dry	19.4	Dry	5.4	16.2	22.6	15.0
9/30/2016	0.3	Dry	Dry	1.4	Dry	19.1	Dry	5.2	16.1	22.2	14.5
10/24/2016	0.2	Dry	Dry	1.1	Dry	18.9	Dry	5.3	16.2	22.4	15.0
11/16/2016	0.2	Dry	Dry	1.2	Dry	19.0	Dry	5.1	16.2	22.5	15.0
12/22/2016	0.2	Dry	Dry	1.3	Dry	19.1	1.5	5.1	16.0	22.1	15.1

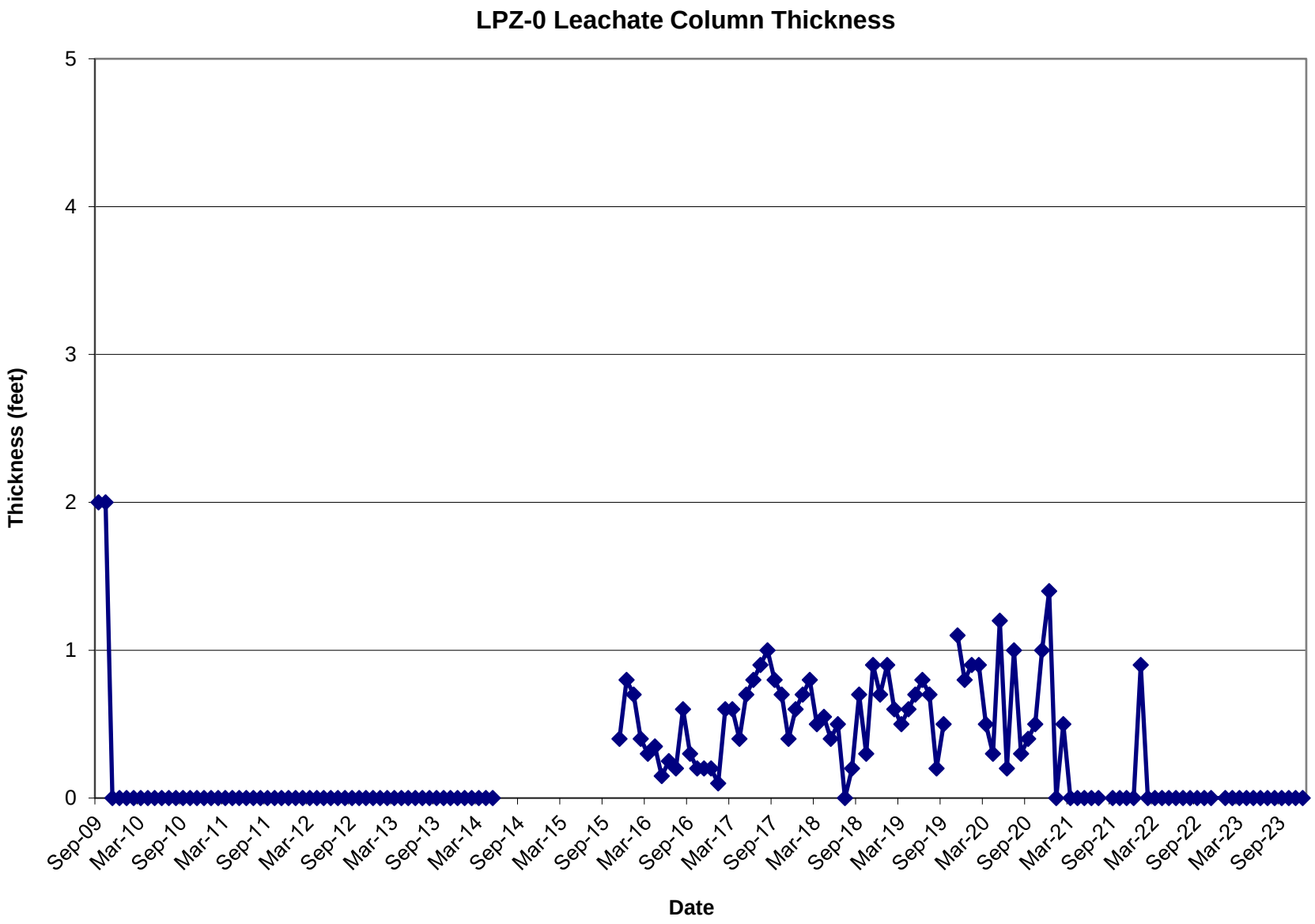
Table E-2
Historical Leachate Column Thicknesses
2023 Leachate Collection System Performance Evaluation Report
Cass County Sanitary Landfill
Permit No. 15-SDP-01-75P

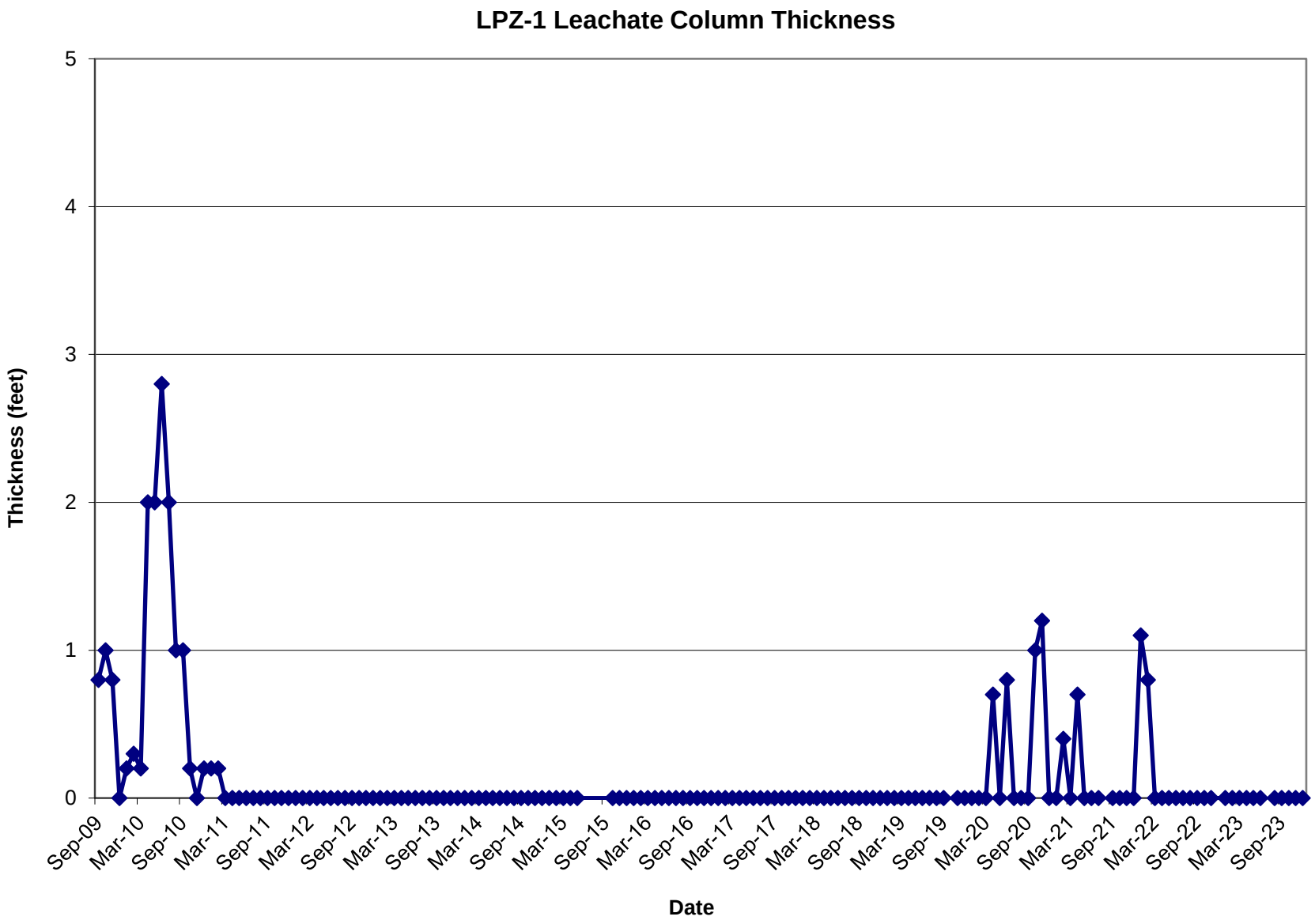
Date	LEACHATE COLUMN THICKNESS										
	LPZ-0	LPZ-1	LPZ-2[3,8]	PZ-1R	PZ-2	PZ-3R [2]	PZ-4	PZ-5R	PZ-6	PZ-7	PZ-8
TOC	151.00	151.00	117.22	83.13	147.30	109.60	150.00	111.78	111.34	133.90	133.29
Constructed Depth	9.00	NM	NM	37.00	55.00	13.44	44.43	47.94	50.00	55.00	58.00
Measured Depth (6/24/2009)	38.00	10.00	12.75	42.30	35.00	50.00	31.50	54.00	NA	NA	NA
1/20/2017	0.1	Dry	Dry	1.3	Dry	19.9	Dry	5.8	19.2	24.0	15.9
2/17/2017	0.6	Dry	Dry	Dry	0.1	18.8	Dry	6.7	16.0	22.8	15.5
3/29/2017	0.6	Dry	Dry	1.3	Dry	19.1	Dry	Dry	16.3	22.8	15.4
4/27/2017	0.4	Dry	Dry	0.5	Dry	19.3	Dry	5.3	15.2	22.4	15.0
5/30/2017	0.7	Dry	Dry	1.3	Dry	19.1	Dry	Dry	16.2	22.4	15.1
6/22/2017	0.8	Dry	Dry	1.2	Dry	18.0	Dry	Dry	18.0	22.5	15.3
7/26/2017	0.9	Dry	Dry	1.2	Dry	12.0	Dry	Dry	18.8	22.5	15.3
8/22/2017	1.0	Dry	Dry	1.3	Dry	18.9	Dry	5.2	16.3	22.3	14.5
9/14/2017	0.8	Dry	Dry	1.3	Dry	10.1	Dry	5.0	19.1	22.4	15.2
10/24/2017	0.7	Dry	Dry	0.6	Dry	18.8	Dry	5.1	19.2	22.2	15.0
11/17/2017	0.4	Dry	Dry	1.3	Dry	19.0	Dry	5.2	16.3	22.1	14.9
12/12/2017	0.6	Dry	Dry	Dry	Dry	18.5	Dry	4.6	Dry	21.9	14.8
1/25/2018	0.7	Dry	Dry	Dry	Dry	18.4	Dry	9.8	14.6	22.3	14.9
2/27/2018	0.8	Dry	Dry	0.5	Dry	18.2	Dry	9.5	14.8	22.4	15.0
3/22/2018	0.5	Dry	Dry	Dry	Dry	18.4	Dry	4.8	Dry	21.8	14.6
4/23/2018	0.6	Dry	Dry	Dry	Dry	18.3	Dry	9.6	14.9	22.2	14.8
5/23/2018	0.4	Dry	Dry	Dry	Dry	18.2	Dry	8.9	14.8	22.1	14.7
6/30/2018	0.5	Dry	Dry	1.4	Dry	18.1	Dry	4.0	16.7	22.3	14.7
7/25/2018	Dry	Dry	Dry	1.3	Dry	14.9	Dry	4.1	22.2	21.1	12.9
8/28/2018	0.2	Dry	Dry	1.1	Dry	15.2	Dry	4.3	20.6	21.0	24.2
9/19/2018	0.7	Dry	Dry	1.3	Dry	7.3	Dry	5.3	18.9	21.2	13.9
10/24/2018	0.3	Dry	Dry	1.3	Dry	0.8	Dry	4.2	23.6	18.8	13.3
11/26/2018	0.9	Dry	Dry	1.2	Dry	1.3	Dry	5.1	21.9	21.0	13.4
12/21/2018	0.7	Dry	Dry	Dry	Dry	16.9	Dry	Dry	10.5		
1/18/2019	0.9	Dry	Dry	Dry	Dry	17.1	Dry	Dry	10.6	22.4	17.3
2/21/2019	0.6	Dry	Dry	1.3	Dry	16.9	Dry	Dry	12.1	22.5	19.2
3/24/2019	0.5	Dry	Dry	Dry	Dry	17.0	Dry	Dry	10.8	22.7	17.9
4/26/2019	0.6	Dry	Dry	Dry	Dry	17.3	Dry	Dry	16.8	22.0	12.9
5/31/2019	0.7	Dry	Dry	Dry	Dry	17.0	Dry	Dry	17.0	21.6	13.1
6/28/2019	0.8	Dry	Dry	Dry	Dry	17.2	Dry	Dry	16.8	21.9	13.3
7/31/2019	0.7	Dry	Dry	Dry	Dry	17.5	Dry	Dry	16.9	22.1	12.9
8/28/2019	0.2	Dry	Dry	1.2	Dry	17.3	1.7	8.4	12.2	22.8	19.5
9/27/2019	0.5	Dry	Dry	Dry	Dry	17.1	Dry	Dry	14.2	21.9	17.9
10/1/2019											
11/19/2019	1.1	Dry	Dry	0.5	Dry	17.2	Dry	3.8	11.2	22.1	14.8
12/20/2019	0.8	Dry	Dry	0.8	Dry	17.2	Dry	Dry	11.9	22.5	17.7
1/1/2020	0.9	Dry		Dry	Dry	17.3	Dry	Dry	11.8	22.6	17.8
2/1/2020	0.9	Dry		Dry	Dry	17.4	Dry	Dry	17.0	22.1	12.9
3/1/2020	0.5	Dry		0.9	Dry	16.0	Dry	Dry	12.5	22.6	17.9
4/1/2020	0.3	0.7	0.4	1.1	Dry	17.1	1.3	4.1	8.4	22.0	14.7
5/1/2020	1.2	Dry		Dry	Dry	16.9	Dry	Dry	10.3	22.2	17.0
6/1/2020	0.2	0.8		Dry	Dry	17.2	1.9	5.5	6.5	21.6	14.6
7/1/2020	1.0	Dry	0.1	Dry	Dry	17.0	Dry	Dry	17.2	22.2	13.2
8/1/2020	0.3	Dry	Dry	1.5	2.0	16.8	1.4	5.4	13.4	21.7	13.9
9/1/2020	0.4	Dry	Dry	Dry	Dry	17.2	Dry	Dry	16.8	21.9	13.3
10/1/2020	0.5	1.0	0.1	1.4	1.0	16.7	1.1	5.0	13.6	21.5	13.6
11/1/2020	1.0	1.2		1.3	0.4	16.6	0.9	3.4	14.8	21.5	13.2
12/1/2020	1.4	Dry	Dry	Dry	Dry	16.8	3.9	3.5	6.2	21.5	13.0

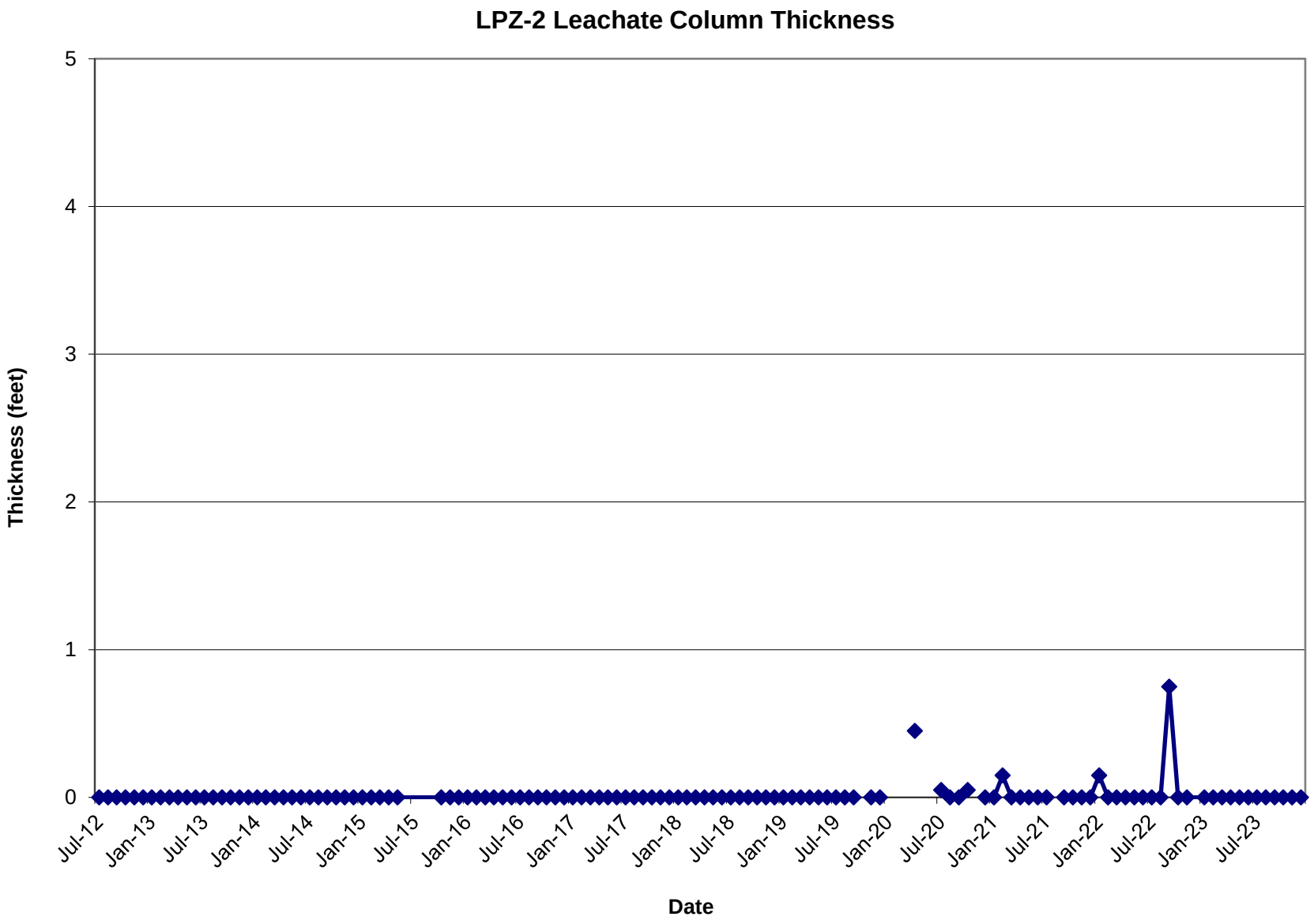
Table E-2
Historical Leachate Column Thicknesses
2023 Leachate Collection System Performance Evaluation Report
Cass County Sanitary Landfill
Permit No. 15-SDP-01-75P

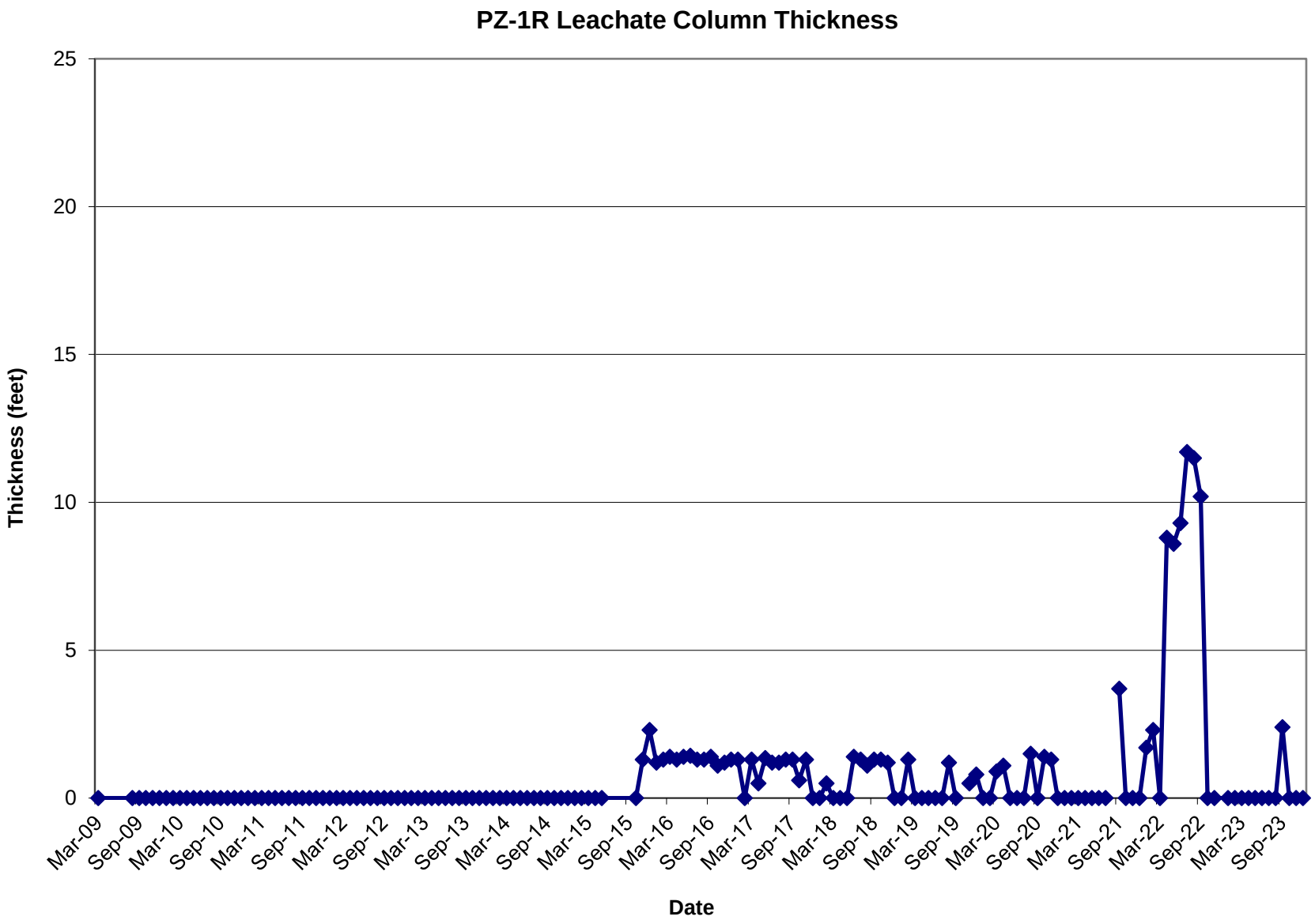
Date	LEACHATE COLUMN THICKNESS										
	LPZ-0	LPZ-1	LPZ-2[3,8]	PZ-1R	PZ-2	PZ-3R [2]	PZ-4	PZ-5R	PZ-6	PZ-7	PZ-8
TOC	151.00	151.00	117.22	83.13	147.30	109.60	150.00	111.78	111.34	133.90	133.29
Constructed Depth	9.00	NM	NM	37.00	55.00	13.44	44.43	47.94	50.00	55.00	58.00
Measured Depth (6/24/2009)	38.00	10.00	12.75	42.30	35.00	50.00	31.50	54.00	NA	NA	NA
1/21/2021	Dry	Dry	Dry	Dry	Dry	17.2	0.7	3.0	7.1	22.1	13.0
2/3/2021	0.5	0.4	0.2	Dry	Dry	17.0	1.4	3.4	6.6	22.0	13.4
3/31/2021	Dry	Dry	Dry	Dry	Dry	18.0	1.5	10.7	-0.8	22.0	13.9
4/27/2021	Dry	0.7	Dry	Dry	Dry	Dry	0.2	21.5	1.7	14.0	15.3
5/25/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	5.1	21.6	13.2
6/23/2021	Dry	Dry	Dry	Dry	2.6	Dry	Dry	3.1	10.2	21.7	13.5
7/26/2021	Dry	Dry	Dry	Dry	Dry	17.4	1.8	3.4	9.8	21.7	13.6
8/11/2021											
9/14/2021	Dry	Dry	Dry	3.7		19.8	3.6	4.2	5.5	21.8	13.4
10/15/2021	Dry	Dry	Dry	Dry	3.2	11.8	3.0	7.3	11.4	21.6	19.5
11/29/2021	Dry	Dry	Dry	Dry	3.9	10.9	1.7	5.7	10.4	23.4	21.9
12/21/2021	Dry	Dry	Dry	Dry	Dry	16.5	1.7	3.5	7.2	21.6	13.9
1/11/2022	0.9	1.1	0.2	1.7	4.4	17.2	0.3	15.9	5.6	21.5	19.4
2/28/2022	Dry	0.8	Dry	2.3	2.0	18.8	1.3	3.8	7.7	23.9	19.9
3/30/2022	Dry	Dry	Dry	Dry	Dry	16.4	1.6	3.4	7.5	22.0	14.4
4/25/2022	Dry	Dry	Dry	8.8	7.0	18.0	Dry	1.1	7.2	23.0	14.6
5/30/2022	Dry	Dry	Dry	8.6	7.2	17.7	Dry	1.2	7.0	22.9	14.2
6/20/2022	Dry	Dry	Dry	9.3	6.9	18.1	2.2	12.7	7.0	23.1	14.1
7/25/2022	Dry	Dry	Dry	11.7	Dry	16.9	Dry	14.9	8.8	23.1	16.0
8/31/2022	Dry	Dry	Dry	11.5	Dry	17.4	1.5	3.2	15.8	22.0	20.4
9/30/2022	Dry	Dry	0.8	10.2	7.7	16.2	Dry	14.8	8.8	16.8	17.2
10/21/2022	Dry	Dry	Dry	Dry	Dry	16.8	0.9	3.8	6.4	23.2	13.5
11/8/2022	Dry	Dry	Dry	Dry	Dry	0.1	1.3	5.1	15.4	19.3	14.4
1/6/2023	Dry	Dry	Dry	Dry		15.9	1.4	2.7	14.5	21.0	12.7
2/28/2023	Dry	Dry	Dry	Dry	Dry	15.5	1.3	3.1	14.7	21.6	12.9
3/24/2023	Dry	Dry	Dry	Dry	Dry	16.1	1.4	3.8	13.9	21.0	13.6
4/26/2023	Dry	Dry	Dry	Dry	Dry	15.7	1.8	2.9	16.8	21.2	13.7
5/31/2023	Dry	Dry	Dry	Dry	Dry	15.5	1.7	2.7	15.0	21.5	20.5
6/22/2023	Dry	Dry	Dry	Dry	Dry	13.1	Dry	1.6	7.0	21.3	13.5
7/26/2023	Dry		Dry	Dry	0.8	13.4	Dry	1.9	6.1	21.2	12.6
8/25/2023	Dry	Dry	Dry	Dry	0.9	13.2	Dry	1.7	6.6	21.9	12.3
9/26/2023	Dry	Dry	Dry	2.4	Dry	15.4	Dry	1.6	6.2	21.1	12.5
10/27/2023	Dry	Dry	Dry	Dry	Dry	16.4	Dry	2.6	7.2	20.7	12.0
11/9/2023	Dry	Dry	Dry	Dry	Dry	0.9	Dry	2.1	5.6	20.7	8.8
12/14/2023	Dry	Dry	Dry	Dry	Dry	16.3	Dry	2.6	Dry	20.6	11.9

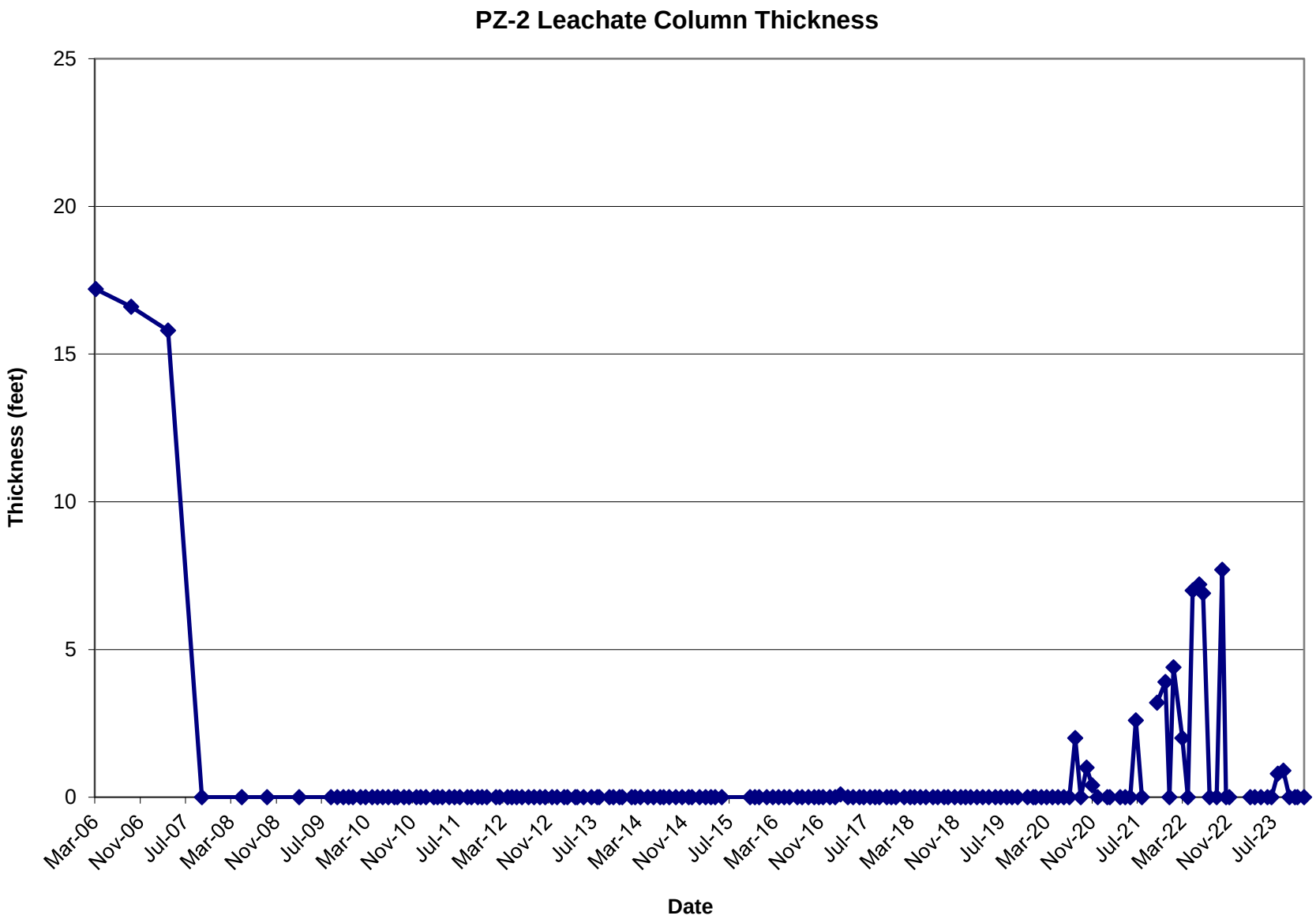
Notes:
NI = Not Installed.
NA = Not Available; Monitoring point has been abandoned.
NM = Not Measured.
1. LPZ-0 not accessible due to weather-related conditions on steep slope.
2. PZ-3 abandoned in April 2009 at a depth of approximately 13 feet, and PZ-3R installed in April 2009 at depth of 50 feet.
3. TOC of LPZ-2 was verified during 5/28/12 survey event. See survey point #1529 in Cass Final Check Topo. Measured Depth was verified on January 11, 2021.
4. LPZ-0 casing modified to allow for head level measurements commencing with November 2015 readings. Prior depth was 38 feet. New depth is 9.0 feet.
5. Due to a change in landfill staff in June 2015, levels were inadvertently not taken for June - September 2015.
6. Measured depth from 6/24/09 used for determining column thickness if constructed depth unavailable or no longer applicable.
7. Measurements were inadvertantly missed during October 2019.
8. Equipment sensitivity likely led to erroneous data in 2020.


LPZ-0 Leachate Column Thickness
Thickness (feet)
5
4
3
2
1
0
Sep-09
Mar-10
Sep-10
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
Mar-23
Sep-23
Date


LPZ-1 Leachate Column Thickness
Thickness (feet)
5
4
3
2
1
0
Sep-09
Mar-10
Sep-10
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
Mar-23
Sep-23
Date


LPZ-2 Leachate Column Thickness
Thickness (feet)
5
4
3
2
1
0
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Date


PZ-1R Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Mar-09
Sep-09
Mar-10
Sep-10
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
Mar-23
Sep-23
Date


PZ-2 Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Mar-06
Nov-06
Jul-07
Mar-08
Nov-08
Jul-09
Mar-10
Nov-10
Jul-11
Mar-12
Nov-12
Jul-13
Mar-14
Nov-14
Jul-15
Mar-16
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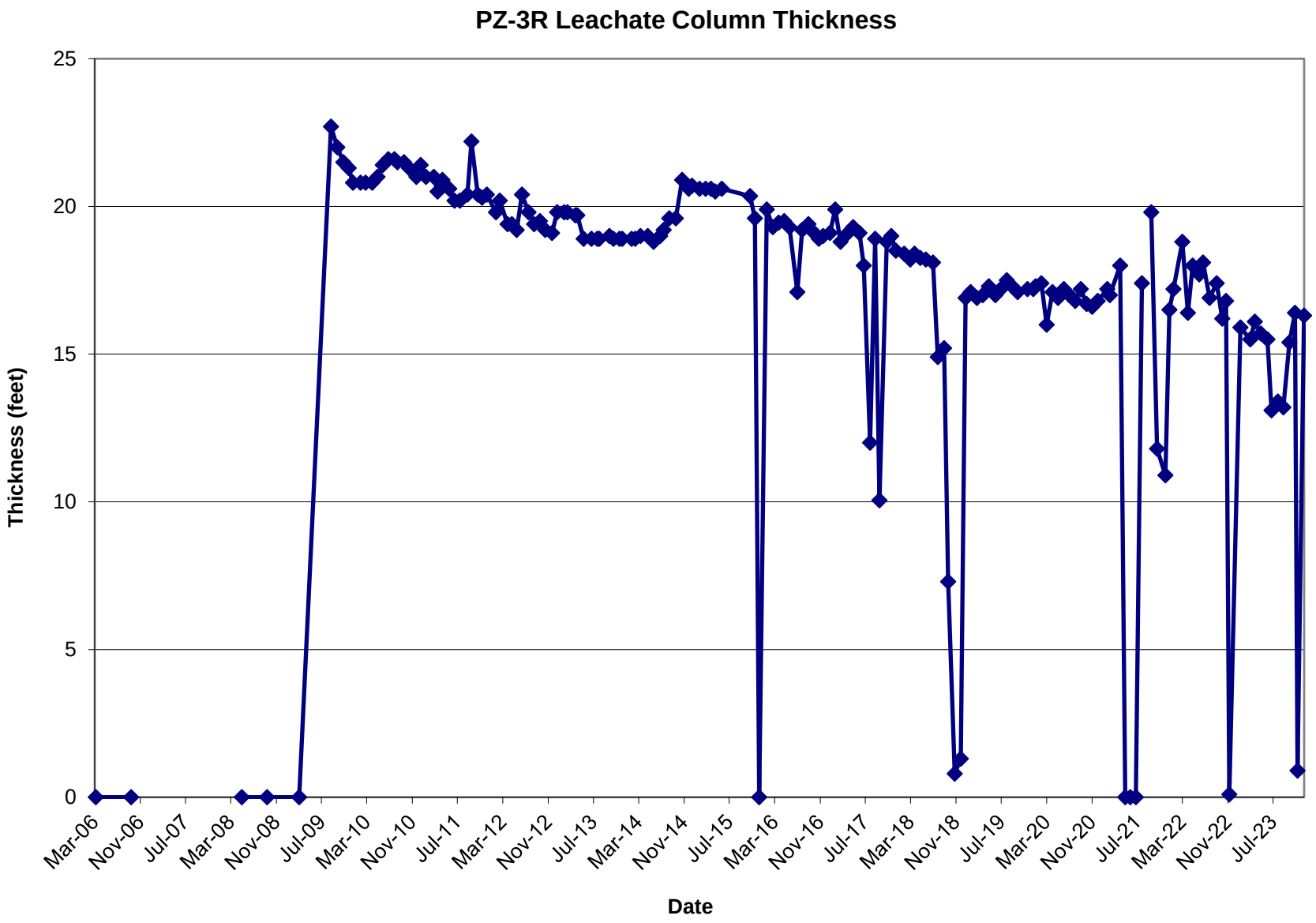
Mar-20
Nov-20
Jul-21
Mar-22
Nov-22
Jul-23
Date


PZ-3R Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Mar-06
Nov-06
Jul-07
Mar-08
Nov-08
Jul-09
Mar-10
Nov-10
Jul-11
Mar-12
Nov-12
Jul-13
Mar-14
Nov-14
Jul-15
Mar-16
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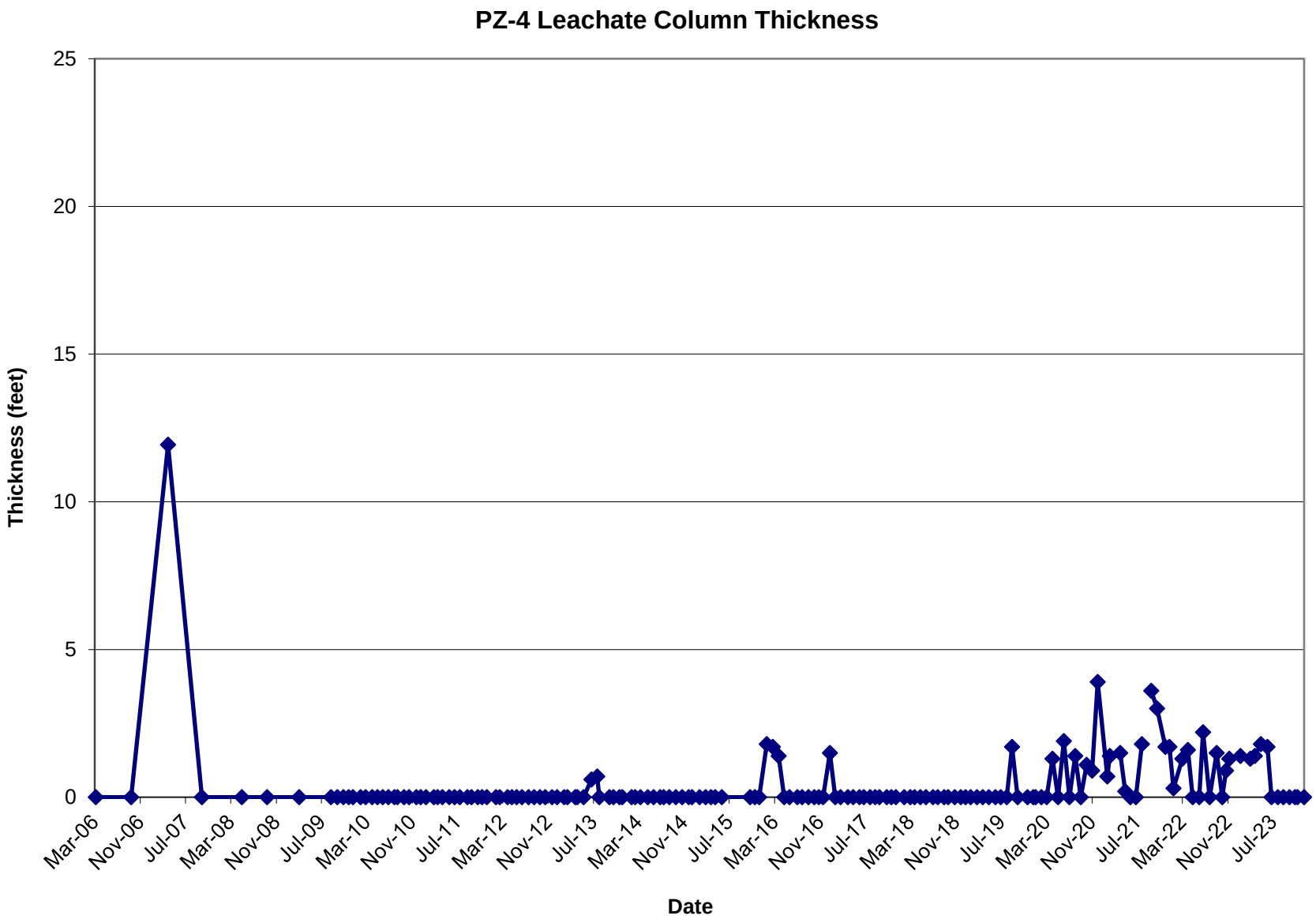
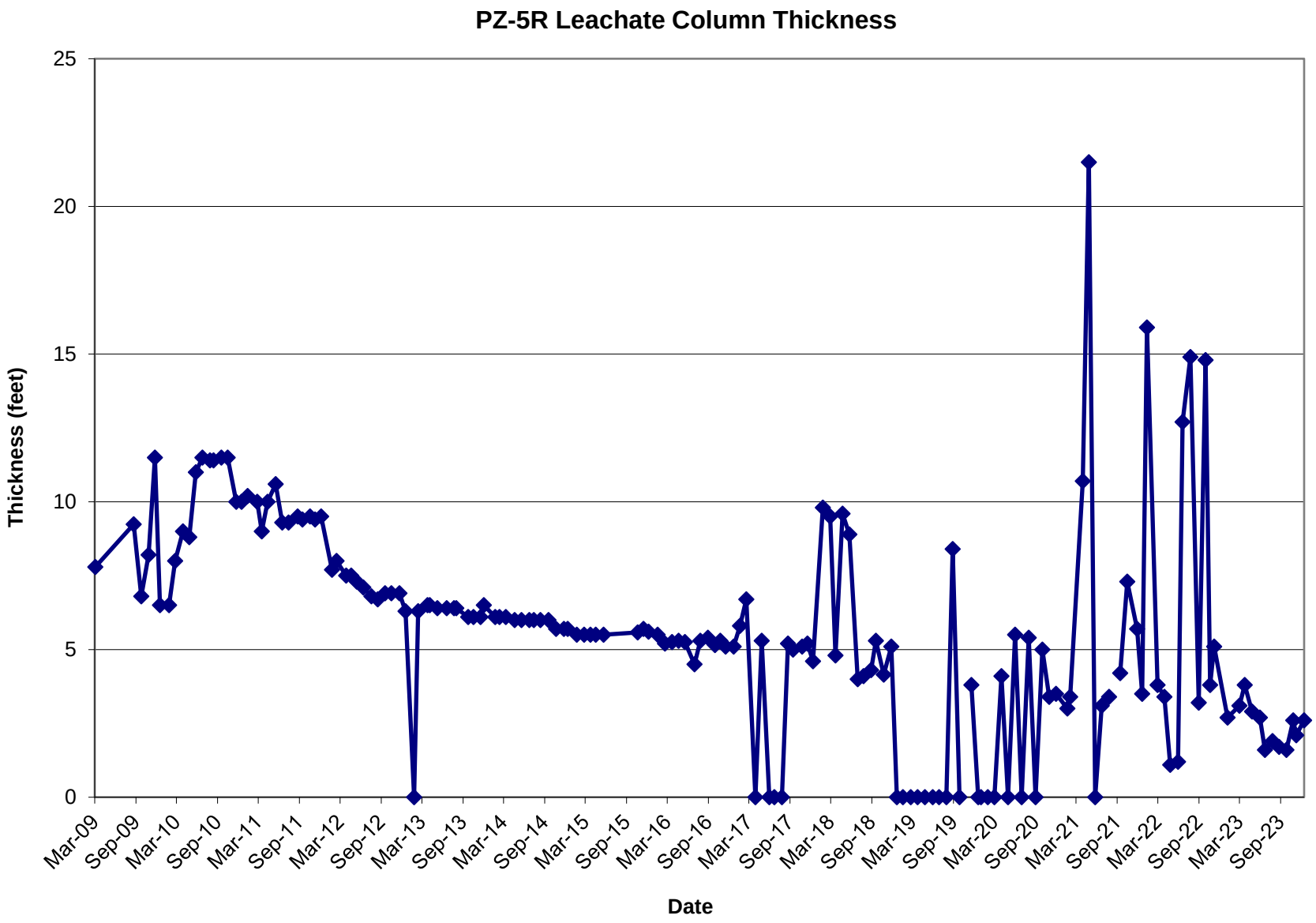
Mar-22
Nov-22
Jul-23
Date


PZ-4 Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Mar-06
Nov-06
Jul-07
Mar-08
Nov-08
Jul-09
Mar-10
Nov-10
Jul-11
Mar-12
Nov-12
Jul-13
Mar-14
Nov-14
Jul-15
Mar-16
Nov-16
Jul-17
Mar-18
Nov-18
Jul-19
Mar-20
Nov-20
Jul-21
Mar-22
Nov-22
Jul-23
Date


PZ-5R Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Mar-09
Sep-09
Mar-10
Sep-10
Mar-11
Sep-11
Mar-12
Sep-12
Mar-13
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
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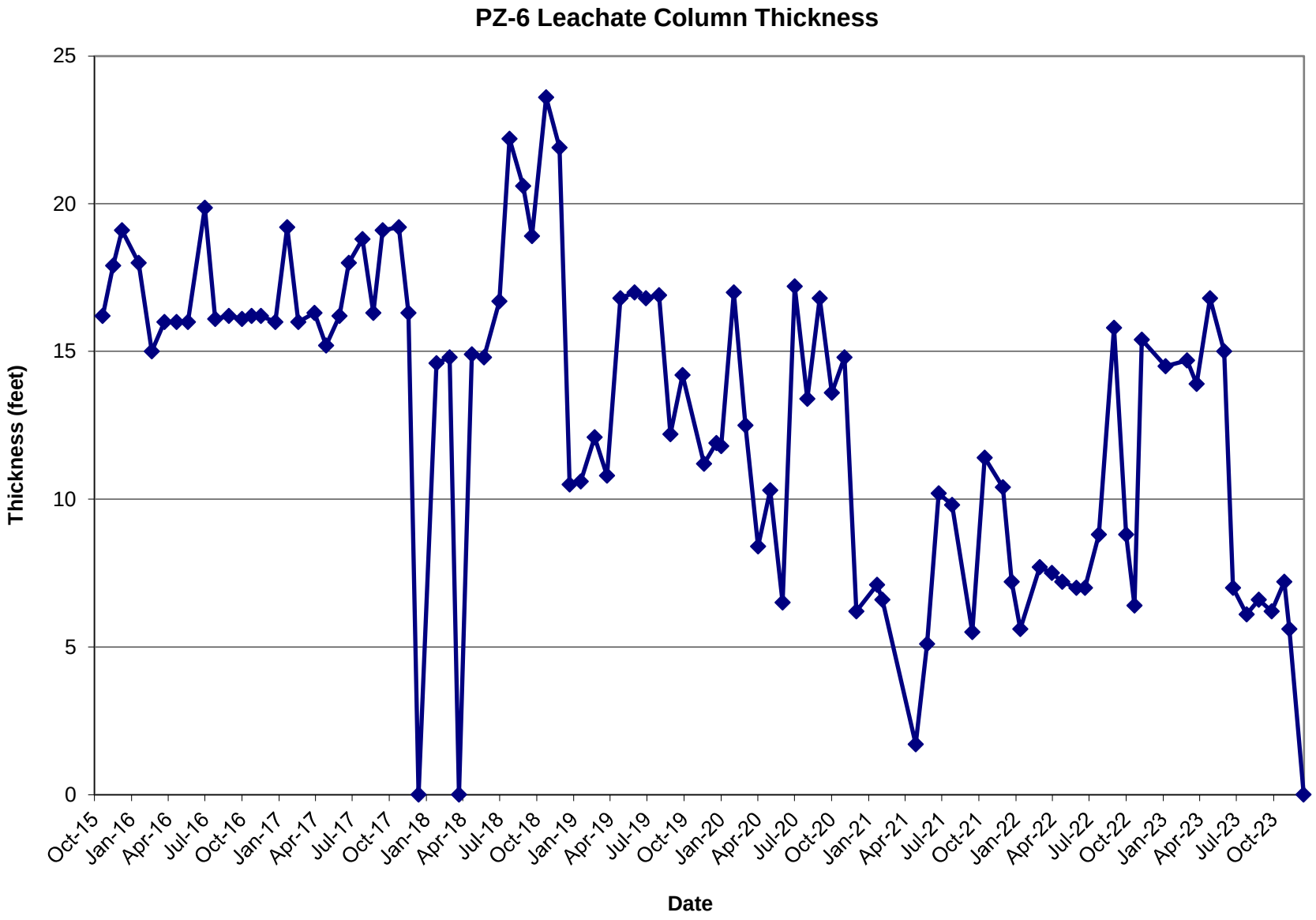
Mar-22
Sep-22
Mar-23
Sep-23
Date


PZ-6 Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
Apr-17
Jul-17
Oct-17
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20
Jul-20
Oct-20
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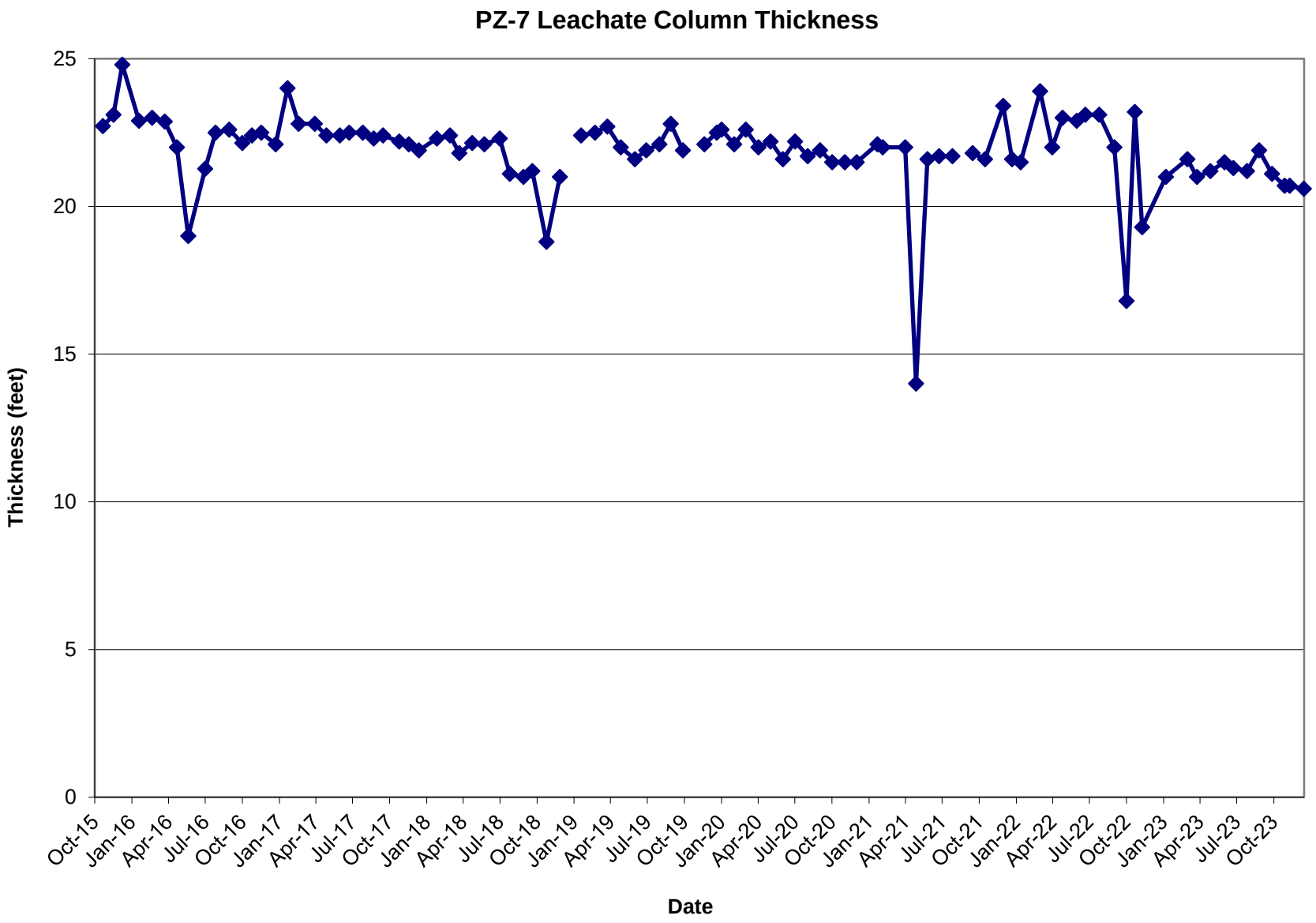
Jul-23
Oct-23
Date


PZ-7 Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
Apr-17
Jul-17
Oct-17
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20
Jul-20
Oct-20
Jan-21
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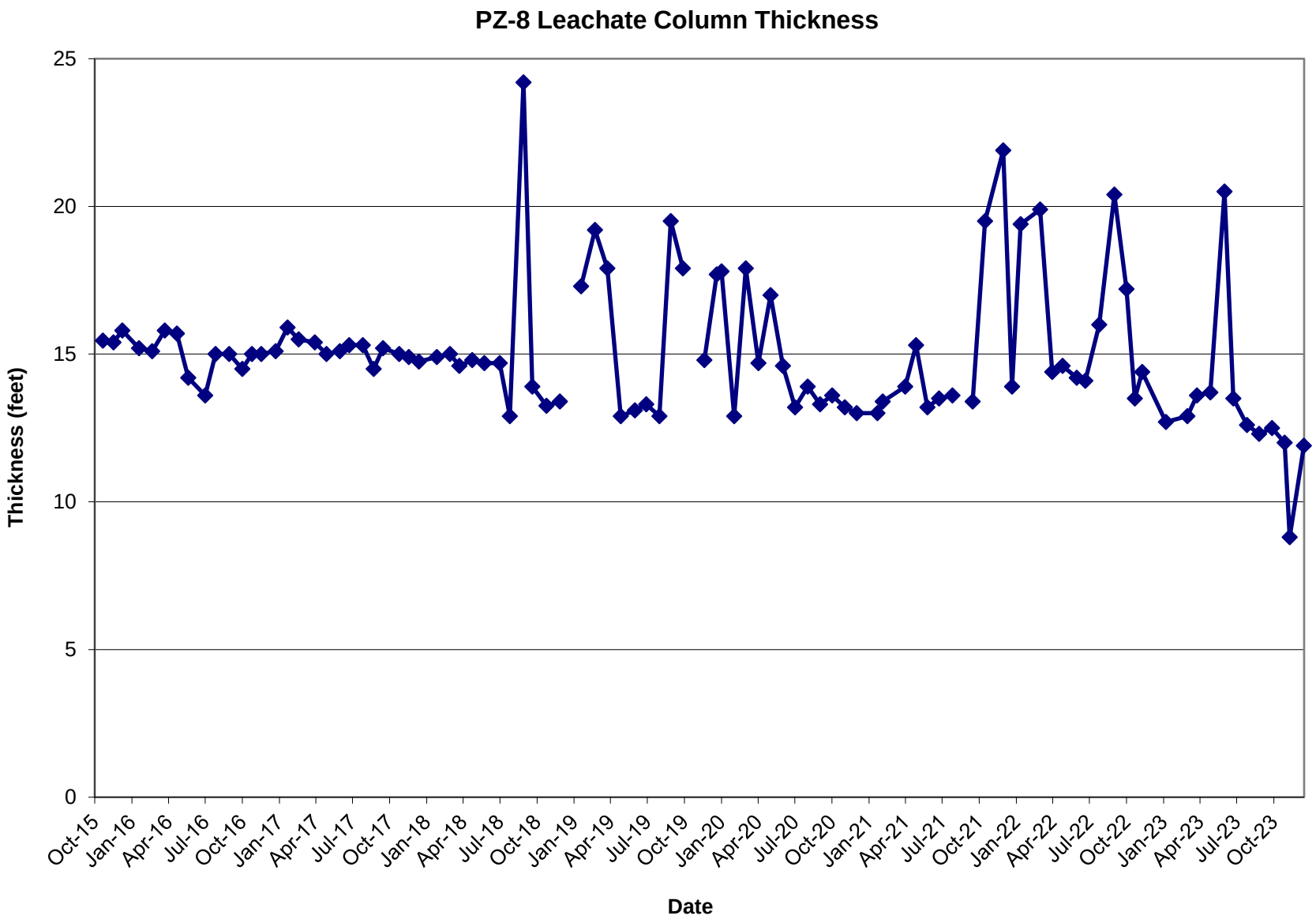
Jul-23
Oct-23
Date


PZ-8 Leachate Column Thickness
Thickness (feet)
25
20
15
10
5
0
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
Apr-17
Jul-17
Oct-17
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20
Jul-20
Oct-20
Jan-21
Apr-21
Jul-21
Oct-21
Jan-22
Apr-22
Jul-22
Oct-22
Jan-23
Apr-23
Jul-23
Oct-23
Date

Appendix B

Laboratory Leachate Analytical Report

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Ben Madson
SCS Engineers
1690 All State Court
Suite 100
West Des Moines, Iowa 50265

Generated 10/17/2023 2:56:31 PM

JOB DESCRIPTION

Cass County Sanitary Landfill

JOB NUMBER

310-266179-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

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The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Job ID: 310-266179-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-266179-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The sample was received on 10/3/2023 4:30 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.6°C

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

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

Pesticides/PCBs
Method 608: Tetrachloro-m-xylene surrogate recovery for the following sample was outside control limits: Leachate Lagoon (310-266179-1). DCB Decachlorobiphenyl surrogate was within the control limits; 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 additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
Method 200.8_CWA: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: Leachate Lagoon (310-266179-1). The sample(s) was preserved to the appropriate pH in the laboratory.

Method 245.2: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: Leachate Lagoon (310-266179-1). The sample(s) was preserved to the appropriate pH in the laboratory.

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

General Chemistry
Method 353.2: The following sample was diluted due to the nature of the sample matrix: Leachate Lagoon (310-266179-1). Elevated reporting limits (RLs) are provided.

Method SM5210B_Calc: The USB dilution water D.O. depletion was greater than 0.2 mg/L. The associated sample results in batch 310-401374 are qualified and reported. The USB depletion was 0.27 mg/L.

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

Sample Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-266179-1	Leachate Lagoon	Water	10/03/23 11:56	10/03/23 16:30

Detection Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Client Sample ID: Leachate Lagoon

Lab Sample ID: 310-266179-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Di-n-octyl phthalate	7.96	J	20.0	7.00	ug/L	1		625.1	Total/NA
Endosulfan I	0.378		0.0479	0.0240	ug/L	1		608	Total/NA
Chloride	1920		100	45.0	mg/L	100		300.0	Total/NA
Sulfate	35.4		10.0	4.20	mg/L	10		300.0	Total/NA
Arsenic	0.0572		0.00200	0.000530	mg/L	1		200.8	Total/NA
Barium	0.0938		0.00200	0.000640	mg/L	1		200.8	Total/NA
Chromium	0.0425		0.00500	0.00110	mg/L	1		200.8	Total/NA
Iron	1.88		0.100	0.0360	mg/L	1		200.8	Total/NA
Nickel	0.136		0.00500	0.00190	mg/L	1		200.8	Total/NA
Selenium	0.00262	J	0.00500	0.00140	mg/L	1		200.8	Total/NA
Zinc	0.0118	J	0.0200	0.00640	mg/L	1		200.8	Total/NA
Ammonia	0.990		0.500	0.220	mg/L	1		350.1	Total/NA
Total Kjeldahl Nitrogen	96.0		5.00	2.75	mg/L	1		351.2	Total/NA
Total Suspended Solids	40.0		15.0	5.10	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	5230		250	170	mg/L	1		SM 2540C	Total/NA
pH	8.5	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Biochemical Oxygen Demand	35.5	b	3.00	3.00	mg/L	1		SM 5210B	Total/NA
Total Organic Carbon	285		40.0	18.8	mg/L	40		SM 5310C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Client Sample ID: Leachate Lagoon

Lab Sample ID: 310-266179-1

Date Collected: 10/03/23 11:56
Matrix: Water
Date Received: 10/03/23 16:30

Method: EPA 624.1 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.500		0.500	0.220	ug/L			10/05/23 12:07	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			10/05/23 12:07	1
Bromoform	<5.00		5.00	0.780	ug/L			10/05/23 12:07	1
Bromomethane	<4.00		4.00	1.10	ug/L			10/05/23 12:07	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			10/05/23 12:07	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			10/05/23 12:07	1
Chloroethane	<4.00		4.00	0.790	ug/L			10/05/23 12:07	1
2-Chloroethyl vinyl ether	<2.00		2.00	1.70	ug/L			10/05/23 12:07	1
Chloroform	<3.00		3.00	1.30	ug/L			10/05/23 12:07	1
Dibromochloromethane	<5.00		5.00	0.750	ug/L			10/05/23 12:07	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			10/05/23 12:07	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			10/05/23 12:07	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			10/05/23 12:07	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			10/05/23 12:07	1
1,3-Dichloropropane	<1.00		1.00	0.400	ug/L			10/05/23 12:07	1
1,3-Dichloropropene, Total	<5.00		5.00	0.560	ug/L			10/05/23 12:07	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			10/05/23 12:07	1
Methylene chloride	<5.00		5.00	1.70	ug/L			10/05/23 12:07	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			10/05/23 12:07	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			10/05/23 12:07	1
Toluene	<1.00		1.00	0.430	ug/L			10/05/23 12:07	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			10/05/23 12:07	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			10/05/23 12:07	1
Trichloroethene	<1.00		1.00	0.430	ug/L			10/05/23 12:07	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			10/05/23 12:07	1
Chloromethane	<3.00		3.00	0.610	ug/L			10/05/23 12:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*70 - 130*		*10/05/23 12:07*	*1*
Dibromofluoromethane (Surr)	*100*		*70 - 130*		*10/05/23 12:07*	*1*
Toluene-d8 (Surr)	*95*		*70 - 130*		*10/05/23 12:07*	*1*

Method: EPA 625.1 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachloroethane	<10.0		10.0	0.970	ug/L		10/04/23 05:45	10/05/23 17:34	1
Dimethyl phthalate	<10.0		10.0	1.00	ug/L		10/04/23 05:45	10/05/23 17:34	1
Isophorone	<10.0		10.0	0.930	ug/L		10/04/23 05:45	10/05/23 17:34	1
Fluorene	<10.0		10.0	0.790	ug/L		10/04/23 05:45	10/05/23 17:34	1
Bis (2-ethyl-hexyl) phthalate	<10.0		10.0	5.50	ug/L		10/04/23 05:45	10/05/23 17:34	1
N-Nitrosodipropylamine	<10.0		10.0	0.920	ug/L		10/04/23 05:45	10/05/23 17:34	1
Acenaphthylene	<10.0		10.0	0.720	ug/L		10/04/23 05:45	10/05/23 17:34	1
2,4-Dichlorophenol	<10.0		10.0	0.850	ug/L		10/04/23 05:45	10/05/23 17:34	1
4-Chlorophenyl phenyl ether	<10.0		10.0	0.690	ug/L		10/04/23 05:45	10/05/23 17:34	1
Benzo(g,h,i)perylene	<10.0		10.0	6.30	ug/L		10/04/23 05:45	10/05/23 17:34	1
4-Chloro-3-methylphenol	<10.0		10.0	0.840	ug/L		10/04/23 05:45	10/05/23 17:34	1
Hexachlorobenzene	<10.0		10.0	0.700	ug/L		10/04/23 05:45	10/05/23 17:34	1
Di-n-octyl phthalate	**7.96**	**J**	20.0	7.00	ug/L		10/04/23 05:45	10/05/23 17:34	1
Hexachlorobutadiene	<10.0		10.0	0.860	ug/L		10/04/23 05:45	10/05/23 17:34	1
Phenanthrene	<10.0		10.0	0.790	ug/L		10/04/23 05:45	10/05/23 17:34	1
2-Nitrophenol	<10.0		10.0	6.80	ug/L		10/04/23 05:45	10/05/23 17:34	1

Client Sample ID: Leachate Lagoon

Lab Sample ID: 310-266179-1

Date Collected: 10/03/23 11:56
Matrix: Water
Date Received: 10/03/23 16:30

Method: EPA 625.1 - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo(k)fluoranthene	<10.0		10.0	2.20	ug/L		10/04/23 05:45	10/05/23 17:34	1
Benzo(a)pyrene	<10.0		10.0	8.10	ug/L		10/04/23 05:45	10/05/23 17:34	1
2,4-Dinitrophenol	<20.0		20.0	13.0	ug/L		10/04/23 05:45	10/05/23 17:34	1
Anthracene	<10.0		10.0	0.870	ug/L		10/04/23 05:45	10/05/23 17:34	1
Di-n-butyl phthalate	<10.0		10.0	5.60	ug/L		10/04/23 05:45	10/05/23 17:34	1
1,2,4-Trichlorobenzene	<10.0		10.0	0.560	ug/L		10/04/23 05:45	10/05/23 17:34	1
Pyrene	<10.0		10.0	0.790	ug/L		10/04/23 05:45	10/05/23 17:34	1
2,4-Dinitrotoluene	<10.0		10.0	6.40	ug/L		10/04/23 05:45	10/05/23 17:34	1
Dibenz(a,h)anthracene	<10.0		10.0	3.90	ug/L		10/04/23 05:45	10/05/23 17:34	1
Nitrobenzene	<10.0		10.0	0.800	ug/L		10/04/23 05:45	10/05/23 17:34	1
Naphthalene	<10.0		10.0	6.10	ug/L		10/04/23 05:45	10/05/23 17:34	1
2,4,6-Trichlorophenol	<10.0		10.0	5.00	ug/L		10/04/23 05:45	10/05/23 17:34	1
Pentachlorophenol	<10.0		10.0	9.60	ug/L		10/04/23 05:45	10/05/23 17:34	1
Fluoranthene	<10.0		10.0	1.70	ug/L		10/04/23 05:45	10/05/23 17:34	1
3,3'-Dichlorobenzidine	<10.0		10.0	1.40	ug/L		10/04/23 05:45	10/05/23 17:34	1
4-Bromophenyl phenyl ether	<10.0		10.0	0.700	ug/L		10/04/23 05:45	10/05/23 17:34	1
Diethyl phthalate	<10.0		10.0	1.70	ug/L		10/04/23 05:45	10/05/23 17:34	1
4,6-Dinitro-2-methylphenol	<10.0		10.0	6.90	ug/L		10/04/23 05:45	10/05/23 17:34	1
bis (2-chloroisopropyl) ether	<10.0		10.0	0.540	ug/L		10/04/23 05:45	10/05/23 17:34	1
N-Nitrosodiphenylamine	<10.0		10.0	0.750	ug/L		10/04/23 05:45	10/05/23 17:34	1
Bis(2-chloroethyl)ether	<10.0		10.0	0.820	ug/L		10/04/23 05:45	10/05/23 17:34	1
Benzo(a)anthracene	<10.0		10.0	0.850	ug/L		10/04/23 05:45	10/05/23 17:34	1
Indeno(1,2,3-cd)pyrene	<10.0		10.0	4.20	ug/L		10/04/23 05:45	10/05/23 17:34	1
Butyl benzyl phthalate	<10.0		10.0	5.40	ug/L		10/04/23 05:45	10/05/23 17:34	1
Hexachlorocyclopentadiene	<10.0		10.0	5.10	ug/L		10/04/23 05:45	10/05/23 17:34	1
Chrysene	<10.0		10.0	0.870	ug/L		10/04/23 05:45	10/05/23 17:34	1
Acenaphthene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 17:34	1
Benzo(b)fluoranthene	<10.0		10.0	4.90	ug/L		10/04/23 05:45	10/05/23 17:34	1
4-Nitrophenol	<10.0		10.0	7.60	ug/L		10/04/23 05:45	10/05/23 17:34	1
2-Chlorophenol	<10.0		10.0	0.540	ug/L		10/04/23 05:45	10/05/23 17:34	1
2,6-Dinitrotoluene	<10.0		10.0	0.520	ug/L		10/04/23 05:45	10/05/23 17:34	1
Phenol	<10.0		10.0	1.10	ug/L		10/04/23 05:45	10/05/23 17:34	1
Bis(2-chloroethoxy)methane	<10.0		10.0	0.760	ug/L		10/04/23 05:45	10/05/23 17:34	1
2-Chloronaphthalene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 17:34	1
2,4,5-Trichlorophenol	<10.0		10.0	5.30	ug/L		10/04/23 05:45	10/05/23 17:34	1
Dibenzofuran	<10.0		10.0	0.740	ug/L		10/04/23 05:45	10/05/23 17:34	1
p-Cresol	<10.0		10.0	0.700	ug/L		10/04/23 05:45	10/05/23 17:34	1
1,3-Dichlorobenzene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 17:34	1
1,2-Dichlorobenzene	<10.0		10.0	0.620	ug/L		10/04/23 05:45	10/05/23 17:34	1
Benzyl alcohol	<10.0		10.0	1.30	ug/L		10/04/23 05:45	10/05/23 17:34	1
1,4-Dichlorobenzene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 17:34	1
Benzoic acid	<100		100	17.0	ug/L		10/04/23 05:45	10/05/23 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*59*		*25 - 110*	*10/04/23 05:45*	*10/05/23 17:34*	*1*
Phenol-d5 (Surr)	*56*		*21 - 110*	*10/04/23 05:45*	*10/05/23 17:34*	*1*
Nitrobenzene-d5 (Surr)	*73*		*45 - 129*	*10/04/23 05:45*	*10/05/23 17:34*	*1*
2-Fluorobiphenyl (Surr)	*64*		*39 - 118*	*10/04/23 05:45*	*10/05/23 17:34*	*1*
2,4,6-Tribromophenol (Surr)	*72*		*27 - 136*	*10/04/23 05:45*	*10/05/23 17:34*	*1*
Terphenyl-d14 (Surr)	*62*		*12 - 144*	*10/04/23 05:45*	*10/05/23 17:34*	*1*

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Client Sample ID: Leachate Lagoon

Lab Sample ID: 310-266179-1

Date Collected: 10/03/23 11:56
Date Received: 10/03/23 16:30

Matrix: Water

Method: EPA 608 - Organochlorine Pesticides/PCBs in Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
delta-BHC	<0.0479		0.0479	0.0479	ug/L		10/10/23 17:46	10/13/23 12:05	1
gamma-BHC (Lindane)	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Heptachlor	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Aldrin	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Heptachlor epoxide	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Endosulfan I	**0.378**		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Dieldrin	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
4,4'-DDE	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Endrin	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Endosulfan II	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
4,4'-DDD	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Endosulfan sulfate	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
4,4'-DDT	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Toxaphene	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Endrin aldehyde	<0.0479		0.0479	0.0240	ug/L		10/10/23 17:46	10/13/23 12:05	1
Chlordane (technical)	<0.0959		0.0959	0.0479	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1016	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1221	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1232	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1242	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1248	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1254	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1
PCB-1260	<0.479		0.479	0.240	ug/L		10/10/23 17:46	10/13/23 12:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*51*		*30 - 131*	*10/10/23 17:46*	*10/13/23 12:05*	*1*
Tetrachloro-m-xylene	*31*	*S1-*	*44 - 120*	*10/10/23 17:46*	*10/13/23 12:05*	*1*

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1920**		100	45.0	mg/L			10/09/23 09:12	100
Sulfate	**35.4**		10.0	4.20	mg/L			10/09/23 18:26	10

Method: EPA 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0572**		0.00200	0.000530	mg/L		10/05/23 09:10	10/09/23 15:09	1
Barium	**0.0938**		0.00200	0.000640	mg/L		10/05/23 09:10	10/09/23 15:09	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		10/05/23 09:10	10/09/23 15:09	1
Chromium	**0.0425**		0.00500	0.00110	mg/L		10/05/23 09:10	10/09/23 15:09	1
Copper	<0.00500		0.00500	0.00180	mg/L		10/05/23 09:10	10/09/23 15:09	1
Iron	**1.88**		0.100	0.0360	mg/L		10/05/23 09:10	10/09/23 15:09	1
Lead	<0.000500		0.000500	0.000240	mg/L		10/05/23 09:10	10/09/23 15:09	1
Nickel	**0.136**		0.00500	0.00190	mg/L		10/05/23 09:10	10/09/23 15:09	1
Selenium	**0.00262**	**J**	0.00500	0.00140	mg/L		10/05/23 09:10	10/09/23 15:09	1
Silver	<0.00100		0.00100	0.000500	mg/L		10/05/23 09:10	10/09/23 15:09	1
Zinc	**0.0118**	**J**	0.0200	0.00640	mg/L		10/05/23 09:10	10/09/23 15:09	1

Client Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Client Sample ID: Leachate Lagoon

Lab Sample ID: 310-266179-1

Date Collected: 10/03/23 11:56
Date Received: 10/03/23 16:30

Matrix: Water

Method: EPA 245.2 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		10/06/23 10:47	10/09/23 11:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease) (40CFR136A 1664A)	<4.9		4.9	4.4	mg/L		10/05/23 07:54	10/05/23 07:54	1
Cyanide, Total (EPA 335.4)	<0.0100		0.0100	0.00430	mg/L		10/05/23 09:23	10/05/23 19:42	1
Ammonia (EPA 350.1)	**0.990**		0.500	0.220	mg/L		10/05/23 08:32	10/05/23 23:06	1
Total Kjeldahl Nitrogen (EPA 351.2)	**96.0**		5.00	2.75	mg/L		10/05/23 07:23	10/05/23 16:26	1
Nitrate Nitrite as N (EPA 353.2)	<1.00		1.00	0.540	mg/L			10/04/23 14:34	10
Total Suspended Solids (USGS I-3765-85)	**40.0**		15.0	5.10	mg/L			10/04/23 15:36	1
Total Dissolved Solids (SM 2540C)	**5230**		250	170	mg/L			10/05/23 14:56	1
Biochemical Oxygen Demand (SM 5210B)	**35.5**	**b**	3.00	3.00	mg/L			10/04/23 06:46	1
Total Organic Carbon (SM 5310C)	**285**		40.0	18.8	mg/L			10/16/23 20:21	40

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**8.5**	**HF**	1.0	1.0	SU			10/03/23 18:19	1

General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent (as Cr) (SM 3500 CR B)	<0.0200		0.0200	0.0100	mg/L			10/03/23 17:28	1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
S1-	Surrogate recovery exceeds control limits, low biased.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
b	Result Detected in the Unseeded Control blank (USB).
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Surrogate Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Method: 624.1 - Volatile Organic Compounds (GC/MS)

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

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)
310-266179-1	Leachate Lagoon	101	100	95
LCS 310-401578/6	Lab Control Sample	90	101	100
LCS 310-401578/7	Lab Control Sample	97	104	97
MB 310-401578/5	Method Blank	104	103	97

Surrogate Legend

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

Method: 625.1 - Semivolatile Organic Compounds (GC/MS)

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

		Percent Surrogate Recovery (Acceptance Limits)					
		2FP	PHL	NBZ	FBP	TBP	TPHL
Lab Sample ID	Client Sample ID	(25-110)	(21-110)	(45-129)	(39-118)	(27-136)	(12-144)
310-266179-1	Leachate Lagoon	59	56	73	64	72	62
LCS 310-401372/2-A	Lab Control Sample	69	60	92	79	91	101
LCSD 310-401372/3-A	Lab Control Sample Dup	71	62	95	81	94	107
MB 310-401372/1-A	Method Blank	69	62	92	70	69	93

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 608 - Organochlorine Pesticides/PCBs in Water

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

		Percent Surrogate Recovery (Acceptance Limits)	
		DCBP2	TCX2
Lab Sample ID	Client Sample ID	(30-131)	(44-120)
310-266179-1	Leachate Lagoon	51	31 S1-
LCS 500-736320/2-A	Lab Control Sample	55	53
LCSD 500-736320/3-A	Lab Control Sample Dup	61	53
MB 500-736320/1-A	Method Blank	67	58

Surrogate Legend

DCBP = DCB Decachlorobiphenyl
TCX = Tetrachloro-m-xylene

Method: 624.1 - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 310-401578/5
Matrix: Water
Analysis Batch: 401578

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.500		0.500	0.220	ug/L			10/05/23 10:18	1
Bromodichloromethane	<1.00		1.00	0.390	ug/L			10/05/23 10:18	1
Bromoform	<5.00		5.00	0.780	ug/L			10/05/23 10:18	1
Bromomethane	<4.00		4.00	1.10	ug/L			10/05/23 10:18	1
Carbon tetrachloride	<2.00		2.00	0.650	ug/L			10/05/23 10:18	1
Chlorobenzene	<1.00		1.00	0.400	ug/L			10/05/23 10:18	1
Chloroethane	<4.00		4.00	0.790	ug/L			10/05/23 10:18	1
2-Chloroethyl vinyl ether	<2.00		2.00	1.70	ug/L			10/05/23 10:18	1
Chloroform	<3.00		3.00	1.30	ug/L			10/05/23 10:18	1
Dibromochloromethane	<5.00		5.00	0.750	ug/L			10/05/23 10:18	1
1,1-Dichloroethane	<1.00		1.00	0.220	ug/L			10/05/23 10:18	1
1,2-Dichloroethane	<1.00		1.00	0.390	ug/L			10/05/23 10:18	1
1,1-Dichloroethene	<2.00		2.00	0.560	ug/L			10/05/23 10:18	1
1,2-Dichloropropane	<1.00		1.00	0.270	ug/L			10/05/23 10:18	1
1,3-Dichloropropane	<1.00		1.00	0.400	ug/L			10/05/23 10:18	1
1,3-Dichloropropene, Total	<5.00		5.00	0.560	ug/L			10/05/23 10:18	1
Ethylbenzene	<1.00		1.00	0.310	ug/L			10/05/23 10:18	1
Methylene chloride	<5.00		5.00	1.70	ug/L			10/05/23 10:18	1
1,1,2,2-Tetrachloroethane	<1.00		1.00	0.470	ug/L			10/05/23 10:18	1
Tetrachloroethene	<1.00		1.00	0.480	ug/L			10/05/23 10:18	1
Toluene	<1.00		1.00	0.430	ug/L			10/05/23 10:18	1
1,1,1-Trichloroethane	<1.00		1.00	0.190	ug/L			10/05/23 10:18	1
1,1,2-Trichloroethane	<1.00		1.00	0.450	ug/L			10/05/23 10:18	1
Trichloroethene	<1.00		1.00	0.430	ug/L			10/05/23 10:18	1
Vinyl chloride	<1.00		1.00	0.180	ug/L			10/05/23 10:18	1
Chloromethane	<3.00		3.00	0.610	ug/L			10/05/23 10:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*70 - 130*		*10/05/23 10:18*	*1*
Dibromofluoromethane (Surr)	*103*		*70 - 130*		*10/05/23 10:18*	*1*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/05/23 10:18*	*1*

Lab Sample ID: LCS 310-401578/6
Matrix: Water
Analysis Batch: 401578

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.0	19.46		ug/L		97	70 - 130
Bromodichloromethane	20.0	19.23		ug/L		96	70 - 130
Bromoform	20.0	17.63		ug/L		88	70 - 130
Carbon tetrachloride	20.0	20.73		ug/L		104	70 - 130
Chlorobenzene	20.0	19.09		ug/L		95	69 - 130
2-Chloroethyl vinyl ether	20.0	19.23		ug/L		96	50 - 150
Chloroform	20.0	20.58		ug/L		103	70 - 130
Dibromochloromethane	20.0	18.77		ug/L		94	70 - 130
1,1-Dichloroethane	20.0	21.19		ug/L		106	70 - 130
1,2-Dichloroethane	20.0	20.70		ug/L		104	70 - 130
1,1-Dichloroethene	20.0	21.11		ug/L		106	61 - 130

Method: 624.1 - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-401578/6
Matrix: Water
Analysis Batch: 401578

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2-Dichloropropane	20.0	20.41		ug/L		102	70 - 130
1,3-Dichloropropane	20.0	19.00		ug/L		95	70 - 130
1,3-Dichloropropene, Total	40.0	39.19		ug/L		98	70 - 130
Ethylbenzene	20.0	19.57		ug/L		98	69 - 130
Methylene chloride	20.0	21.97		ug/L		110	60 - 140
1,1,2,2-Tetrachloroethane	20.0	19.86		ug/L		99	64 - 130
Tetrachloroethene	20.0	20.05		ug/L		100	70 - 130
Toluene	20.0	19.34		ug/L		97	70 - 130
1,1,1-Trichloroethane	20.0	20.66		ug/L		103	70 - 130
1,1,2-Trichloroethane	20.0	18.98		ug/L		95	70 - 130
Trichloroethene	20.0	19.98		ug/L		100	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*90*		*70 - 130*
Dibromofluoromethane (Surr)	*101*		*70 - 130*
Toluene-d8 (Surr)	*100*		*70 - 130*

Lab Sample ID: LCS 310-401578/7
Matrix: Water
Analysis Batch: 401578

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	16.93		ug/L		85	24 - 150
Chloroethane	20.0	21.22		ug/L		106	51 - 137
Vinyl chloride	20.0	21.04		ug/L		105	57 - 136
Chloromethane	20.0	19.54		ug/L		98	37 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*
Dibromofluoromethane (Surr)	*104*		*70 - 130*
Toluene-d8 (Surr)	*97*		*70 - 130*

Method: 625.1 - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 310-401372/1-A
Matrix: Water
Analysis Batch: 401587

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 401372

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachloroethane	<10.0		10.0	0.970	ug/L		10/04/23 05:45	10/05/23 15:51	1
Dimethyl phthalate	<10.0		10.0	1.00	ug/L		10/04/23 05:45	10/05/23 15:51	1
Isophorone	<10.0		10.0	0.930	ug/L		10/04/23 05:45	10/05/23 15:51	1
Fluorene	<10.0		10.0	0.790	ug/L		10/04/23 05:45	10/05/23 15:51	1
Bis (2-ethyl-hexyl) phthalate	<10.0		10.0	5.50	ug/L		10/04/23 05:45	10/05/23 15:51	1
N-Nitrosodipropylamine	<10.0		10.0	0.920	ug/L		10/04/23 05:45	10/05/23 15:51	1
Acenaphthylene	<10.0		10.0	0.720	ug/L		10/04/23 05:45	10/05/23 15:51	1
2,4-Dichlorophenol	<10.0		10.0	0.850	ug/L		10/04/23 05:45	10/05/23 15:51	1
4-Chlorophenyl phenyl ether	<10.0		10.0	0.690	ug/L		10/04/23 05:45	10/05/23 15:51	1

Method: 625.1 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 310-401372/1-A
Matrix: Water
Analysis Batch: 401587

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 401372

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo(g,h,i)perylene	<10.0		10.0	6.30	ug/L		10/04/23 05:45	10/05/23 15:51	1
4-Chloro-3-methylphenol	<10.0		10.0	0.840	ug/L		10/04/23 05:45	10/05/23 15:51	1
Hexachlorobenzene	<10.0		10.0	0.700	ug/L		10/04/23 05:45	10/05/23 15:51	1
Di-n-octyl phthalate	<20.0		20.0	7.00	ug/L		10/04/23 05:45	10/05/23 15:51	1
Hexachlorobutadiene	<10.0		10.0	0.860	ug/L		10/04/23 05:45	10/05/23 15:51	1
Phenanthrene	<10.0		10.0	0.790	ug/L		10/04/23 05:45	10/05/23 15:51	1
2-Nitrophenol	<10.0		10.0	6.80	ug/L		10/04/23 05:45	10/05/23 15:51	1
Benzo(k)fluoranthene	<10.0		10.0	2.20	ug/L		10/04/23 05:45	10/05/23 15:51	1
Benzo(a)pyrene	<10.0		10.0	8.10	ug/L		10/04/23 05:45	10/05/23 15:51	1
2,4-Dinitrophenol	<20.0		20.0	13.0	ug/L		10/04/23 05:45	10/05/23 15:51	1
Anthracene	<10.0		10.0	0.870	ug/L		10/04/23 05:45	10/05/23 15:51	1
Di-n-butyl phthalate	<10.0		10.0	5.60	ug/L		10/04/23 05:45	10/05/23 15:51	1
1,2,4-Trichlorobenzene	<10.0		10.0	0.560	ug/L		10/04/23 05:45	10/05/23 15:51	1
Pyrene	<10.0		10.0	0.790	ug/L		10/04/23 05:45	10/05/23 15:51	1
2,4-Dinitrotoluene	<10.0		10.0	6.40	ug/L		10/04/23 05:45	10/05/23 15:51	1
Dibenz(a,h)anthracene	<10.0		10.0	3.90	ug/L		10/04/23 05:45	10/05/23 15:51	1
Nitrobenzene	<10.0		10.0	0.800	ug/L		10/04/23 05:45	10/05/23 15:51	1
Naphthalene	<10.0		10.0	6.10	ug/L		10/04/23 05:45	10/05/23 15:51	1
2,4,6-Trichlorophenol	<10.0		10.0	5.00	ug/L		10/04/23 05:45	10/05/23 15:51	1
Pentachlorophenol	<10.0		10.0	9.60	ug/L		10/04/23 05:45	10/05/23 15:51	1
Fluoranthene	<10.0		10.0	1.70	ug/L		10/04/23 05:45	10/05/23 15:51	1
3,3'-Dichlorobenzidine	<10.0		10.0	1.40	ug/L		10/04/23 05:45	10/05/23 15:51	1
4-Bromophenyl phenyl ether	<10.0		10.0	0.700	ug/L		10/04/23 05:45	10/05/23 15:51	1
Diethyl phthalate	<10.0		10.0	1.70	ug/L		10/04/23 05:45	10/05/23 15:51	1
4,6-Dinitro-2-methylphenol	<10.0		10.0	6.90	ug/L		10/04/23 05:45	10/05/23 15:51	1
bis (2-chloroisopropyl) ether	<10.0		10.0	0.540	ug/L		10/04/23 05:45	10/05/23 15:51	1
N-Nitrosodiphenylamine	<10.0		10.0	0.750	ug/L		10/04/23 05:45	10/05/23 15:51	1
Bis(2-chloroethyl)ether	<10.0		10.0	0.820	ug/L		10/04/23 05:45	10/05/23 15:51	1
Benzo(a)anthracene	<10.0		10.0	0.850	ug/L		10/04/23 05:45	10/05/23 15:51	1
Indeno(1,2,3-cd)pyrene	<10.0		10.0	4.20	ug/L		10/04/23 05:45	10/05/23 15:51	1
Butyl benzyl phthalate	<10.0		10.0	5.40	ug/L		10/04/23 05:45	10/05/23 15:51	1
Hexachlorocyclopentadiene	<10.0		10.0	5.10	ug/L		10/04/23 05:45	10/05/23 15:51	1
Chrysene	<10.0		10.0	0.870	ug/L		10/04/23 05:45	10/05/23 15:51	1
Acenaphthene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 15:51	1
Benzo(b)fluoranthene	<10.0		10.0	4.90	ug/L		10/04/23 05:45	10/05/23 15:51	1
4-Nitrophenol	<10.0		10.0	7.60	ug/L		10/04/23 05:45	10/05/23 15:51	1
2-Chlorophenol	<10.0		10.0	0.540	ug/L		10/04/23 05:45	10/05/23 15:51	1
2,6-Dinitrotoluene	<10.0		10.0	0.520	ug/L		10/04/23 05:45	10/05/23 15:51	1
Phenol	<10.0		10.0	1.10	ug/L		10/04/23 05:45	10/05/23 15:51	1
Bis(2-chloroethoxy)methane	<10.0		10.0	0.760	ug/L		10/04/23 05:45	10/05/23 15:51	1
2-Chloronaphthalene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 15:51	1
2,4,5-Trichlorophenol	<10.0		10.0	5.30	ug/L		10/04/23 05:45	10/05/23 15:51	1
Dibenzofuran	<10.0		10.0	0.740	ug/L		10/04/23 05:45	10/05/23 15:51	1
p-Cresol	<10.0		10.0	0.700	ug/L		10/04/23 05:45	10/05/23 15:51	1
1,3-Dichlorobenzene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 15:51	1
1,2-Dichlorobenzene	<10.0		10.0	0.620	ug/L		10/04/23 05:45	10/05/23 15:51	1
Benzyl alcohol	<10.0		10.0	1.30	ug/L		10/04/23 05:45	10/05/23 15:51	1
1,4-Dichlorobenzene	<10.0		10.0	0.640	ug/L		10/04/23 05:45	10/05/23 15:51	1
Benzoic acid	<100		100	17.0	ug/L		10/04/23 05:45	10/05/23 15:51	1

Method: 625.1 - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorophenol (Surr)	69		25 - 110	10/04/23 05:45	10/05/23 15:51	1
Phenol-d5 (Surr)	62		21 - 110	10/04/23 05:45	10/05/23 15:51	1
Nitrobenzene-d5 (Surr)	92		45 - 129	10/04/23 05:45	10/05/23 15:51	1
2-Fluorobiphenyl (Surr)	70		39 - 118	10/04/23 05:45	10/05/23 15:51	1
2,4,6-Tribromophenol (Surr)	69		27 - 136	10/04/23 05:45	10/05/23 15:51	1
Terphenyl-d14 (Surr)	93		12 - 144	10/04/23 05:45	10/05/23 15:51	1

Lab Sample ID: LCS 310-401372/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401587 — **Prep Batch: 401372**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hexachloroethane	100	51.21		ug/L		51	40 - 110
Dimethyl phthalate	100	89.41		ug/L		89	43 - 120
Isophorone	100	85.12		ug/L		85	50 - 125
Fluorene	100	86.56		ug/L		87	59 - 119
Bis (2-ethyl-hexyl) phthalate	100	97.32		ug/L		97	43 - 143
N-Nitrosodipropylamine	100	79.44		ug/L		79	45 - 130
Acenaphthylene	100	80.87		ug/L		81	40 - 110
2,4-Dichlorophenol	100	88.25		ug/L		88	41 - 124
4-Chlorophenyl phenyl ether	100	82.07		ug/L		82	44 - 116
Benzo(g,h,i)perylene	100	101.0		ug/L		101	43 - 139
4-Chloro-3-methylphenol	100	86.03		ug/L		86	49 - 130
Hexachlorobenzene	100	96.26		ug/L		96	48 - 119
Di-n-octyl phthalate	100	89.66		ug/L		90	34 - 146
Hexachlorobutadiene	100	58.42		ug/L		58	32 - 110
Phenanthrene	100	86.94		ug/L		87	54 - 117
2-Nitrophenol	100	88.11		ug/L		88	41 - 129
Benzo(k)fluoranthene	100	88.15		ug/L		88	47 - 130
Benzo(a)pyrene	100	89.97		ug/L		90	48 - 125
2,4-Dinitrophenol	200	127.9		ug/L		64	10 - 138
Anthracene	100	86.73		ug/L		87	51 - 120
Di-n-butyl phthalate	100	90.76		ug/L		91	50 - 120
1,2,4-Trichlorobenzene	100	63.93		ug/L		64	44 - 110
Pyrene	100	97.22		ug/L		97	52 - 120
2,4-Dinitrotoluene	100	91.03		ug/L		91	47 - 137
Dibenz(a,h)anthracene	100	92.44		ug/L		92	38 - 149
Nitrobenzene	100	83.77		ug/L		84	47 - 116
Naphthalene	100	74.51		ug/L		75	38 - 110
2,4,6-Trichlorophenol	100	85.91		ug/L		86	37 - 139
Pentachlorophenol	200	142.9		ug/L		71	26 - 133
Fluoranthene	100	84.50		ug/L		84	47 - 128
4-Bromophenyl phenyl ether	100	87.78		ug/L		88	53 - 119
Diethyl phthalate	100	96.46		ug/L		96	43 - 120
4,6-Dinitro-2-methylphenol	200	173.3		ug/L		87	22 - 143
bis (2-chloroisopropyl) ether	100	77.15		ug/L		77	36 - 123
N-Nitrosodiphenylamine	100	83.22		ug/L		83	49 - 121
Bis(2-chloroethyl)ether	100	80.93		ug/L		81	43 - 123
Benzo(a)anthracene	100	89.30		ug/L		89	51 - 123
Indeno(1,2,3-cd)pyrene	100	103.8		ug/L		104	37 - 150
Butyl benzyl phthalate	100	92.63		ug/L		93	46 - 135

Method: 625.1 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-401372/2-A
Matrix: Water
Analysis Batch: 401587

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 401372

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hexachlorocyclopentadiene	100	57.31		ug/L		57	10 - 110
Chrysene	100	90.00		ug/L		90	51 - 125
Acenaphthene	100	79.29		ug/L		79	47 - 110
Benzo(b)fluoranthene	100	90.55		ug/L		91	49 - 129
4-Nitrophenol	200	90.38		ug/L		45	18 - 110
2-Chlorophenol	100	88.18		ug/L		88	44 - 117
2,6-Dinitrotoluene	100	89.85		ug/L		90	51 - 130
Phenol	100	59.43		ug/L		59	29 - 110
Bis(2-chloroethoxy)methane	100	87.31		ug/L		87	48 - 121
2-Chloronaphthalene	100	75.76		ug/L		76	60 - 110
2,4,5-Trichlorophenol	100	83.23		ug/L		83	35 - 133
Dibenzofuran	100	81.06		ug/L		81	45 - 112
p-Cresol	100	80.52		ug/L		81	46 - 117
1,3-Dichlorobenzene	100	56.75		ug/L		57	28 - 110
1,2-Dichlorobenzene	100	61.83		ug/L		62	31 - 110
Benzyl alcohol	100	96.33		ug/L		96	39 - 128
1,4-Dichlorobenzene	100	59.58		ug/L		60	28 - 110

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*69*		*25 - 110*
Phenol-d5 (Surr)	*60*		*21 - 110*
Nitrobenzene-d5 (Surr)	*92*		*45 - 129*
2-Fluorobiphenyl (Surr)	*79*		*39 - 118*
2,4,6-Tribromophenol (Surr)	*91*		*27 - 136*
Terphenyl-d14 (Surr)	*101*		*12 - 144*

Lab Sample ID: LCSD 310-401372/3-A
Matrix: Water
Analysis Batch: 401587

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 401372

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Hexachloroethane	100	59.37		ug/L		59	40 - 110	15	35
Dimethyl phthalate	100	89.81		ug/L		90	43 - 120	0	35
Isophorone	100	84.55		ug/L		85	50 - 125	1	35
Fluorene	100	86.61		ug/L		87	59 - 119	0	35
Bis (2-ethyl-hexyl) phthalate	100	100.2		ug/L		100	43 - 143	3	35
N-Nitrosodipropylamine	100	81.45		ug/L		81	45 - 130	2	35
Acenaphthylene	100	80.50		ug/L		81	40 - 110	0	35
2,4-Dichlorophenol	100	88.38		ug/L		88	41 - 124	0	35
4-Chlorophenyl phenyl ether	100	80.36		ug/L		80	44 - 116	2	35
Benzo(g,h,i)perylene	100	103.9		ug/L		104	43 - 139	3	35
4-Chloro-3-methylphenol	100	88.54		ug/L		89	49 - 130	3	35
Hexachlorobenzene	100	96.74		ug/L		97	48 - 119	0	35
Di-n-octyl phthalate	100	90.90		ug/L		91	34 - 146	1	35
Hexachlorobutadiene	100	66.44		ug/L		66	32 - 110	13	35
Phenanthrene	100	88.35		ug/L		88	54 - 117	2	35
2-Nitrophenol	100	85.92		ug/L		86	41 - 129	3	35
Benzo(k)fluoranthene	100	95.22		ug/L		95	47 - 130	8	35

Method: 625.1 - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 310-401372/3-A
Matrix: Water
Analysis Batch: 401587

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 401372

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzo(a)pyrene			100	95.17		ug/L		95	48 - 125	6	35
2,4-Dinitrophenol			200	132.7		ug/L		66	10 - 138	4	35
Anthracene			100	87.88		ug/L		88	51 - 120	1	35
Di-n-butyl phthalate			100	91.53		ug/L		92	50 - 120	1	35
1,2,4-Trichlorobenzene			100	69.06		ug/L		69	44 - 110	8	35
Pyrene			100	99.17		ug/L		99	52 - 120	2	35
2,4-Dinitrotoluene			100	92.20		ug/L		92	47 - 137	1	35
Dibenz(a,h)anthracene			100	94.53		ug/L		95	38 - 149	2	35
Nitrobenzene			100	81.97		ug/L		82	47 - 116	2	35
Naphthalene			100	73.85		ug/L		74	38 - 110	1	35
2,4,6-Trichlorophenol			100	86.56		ug/L		87	37 - 139	1	35
Pentachlorophenol			200	146.3		ug/L		73	26 - 133	2	35
Fluoranthene			100	86.94		ug/L		87	47 - 128	3	35
4-Bromophenyl phenyl ether			100	91.13		ug/L		91	53 - 119	4	35
Diethyl phthalate			100	98.83		ug/L		99	43 - 120	2	35
4,6-Dinitro-2-methylphenol			200	178.4		ug/L		89	22 - 143	3	35
bis (2-chloroisopropyl) ether			100	75.87		ug/L		76	36 - 123	2	35
N-Nitrosodiphenylamine			100	81.89		ug/L		82	49 - 121	2	35
Bis(2-chloroethyl)ether			100	78.72		ug/L		79	43 - 123	3	35
Benzo(a)anthracene			100	93.09		ug/L		93	51 - 123	4	35
Indeno(1,2,3-cd)pyrene			100	106.9		ug/L		107	37 - 150	3	35
Butyl benzyl phthalate			100	94.61		ug/L		95	46 - 135	2	35
Hexachlorocyclopentadiene			100	63.42		ug/L		63	10 - 110	10	35
Chrysene			100	90.89		ug/L		91	51 - 125	1	35
Acenaphthene			100	78.25		ug/L		78	47 - 110	1	35
Benzo(b)fluoranthene			100	94.29		ug/L		94	49 - 129	4	35
4-Nitrophenol			200	93.71		ug/L		47	18 - 110	4	35
2-Chlorophenol			100	87.44		ug/L		87	44 - 117	1	35
2,6-Dinitrotoluene			100	92.64		ug/L		93	51 - 130	3	35
Phenol			100	58.15		ug/L		58	29 - 110	2	35
Bis(2-chloroethoxy)methane			100	87.23		ug/L		87	48 - 121	0	35
2-Chloronaphthalene			100	75.43		ug/L		75	60 - 110	0	24
2,4,5-Trichlorophenol			100	82.84		ug/L		83	35 - 133	0	35
Dibenzofuran			100	80.10		ug/L		80	45 - 112	1	35
p-Cresol			100	81.44		ug/L		81	46 - 117	1	35
1,3-Dichlorobenzene			100	61.84		ug/L		62	28 - 110	9	35
1,2-Dichlorobenzene			100	63.81		ug/L		64	31 - 110	3	35
Benzyl alcohol			100	95.26		ug/L		95	39 - 128	1	35
1,4-Dichlorobenzene			100	64.23		ug/L		64	28 - 110	8	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorophenol (Surr)	*71*		*25 - 110*
Phenol-d5 (Surr)	*62*		*21 - 110*
Nitrobenzene-d5 (Surr)	*95*		*45 - 129*
2-Fluorobiphenyl (Surr)	*81*		*39 - 118*
2,4,6-Tribromophenol (Surr)	*94*		*27 - 136*
Terphenyl-d14 (Surr)	*107*		*12 - 144*

Method: 608 - Organochlorine Pesticides/PCBs in Water

Lab Sample ID: MB 500-736320/1-A
Matrix: Water
Analysis Batch: 736508

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 736320

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
beta-BHC	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
delta-BHC	<0.0500		0.0500	0.0500	ug/L		10/10/23 17:46	10/12/23 12:51	1
gamma-BHC (Lindane)	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Heptachlor	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Aldrin	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Heptachlor epoxide	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Endosulfan I	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Dieldrin	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
4,4'-DDE	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Endrin	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Endosulfan II	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
4,4'-DDD	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Endosulfan sulfate	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
4,4'-DDT	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Toxaphene	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
Endrin aldehyde	<0.0500		0.0500	0.0250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1016	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1221	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1232	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1242	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1248	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1254	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1
PCB-1260	<0.500		0.500	0.250	ug/L		10/10/23 17:46	10/12/23 12:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*67*		*30 - 131*	*10/10/23 17:46*	*10/12/23 12:51*	*1*
Tetrachloro-m-xylene	*58*		*44 - 120*	*10/10/23 17:46*	*10/12/23 12:51*	*1*

Lab Sample ID: LCS 500-736320/2-A
Matrix: Water
Analysis Batch: 736508

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 736320

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
beta-BHC	0.400	0.2650		ug/L		66	17 - 147
delta-BHC	0.400	0.2598		ug/L		65	32 - 127
gamma-BHC (Lindane)	0.400	0.2524		ug/L		63	19 - 140
Heptachlor	0.400	0.2549		ug/L		64	34 - 111
Aldrin	0.400	0.2371		ug/L		59	42 - 122
Heptachlor epoxide	0.400	0.2638		ug/L		66	37 - 142
Endosulfan I	0.400	0.2476		ug/L		62	45 - 153
Dieldrin	0.400	0.2667		ug/L		67	36 - 146
4,4'-DDE	0.400	0.2446		ug/L		61	30 - 145
Endrin	0.400	0.2633		ug/L		66	30 - 147
Endosulfan II	0.400	0.2682		ug/L		67	10 - 202
4,4'-DDD	0.400	0.2726		ug/L		68	31 - 141
Endosulfan sulfate	0.400	0.2611		ug/L		65	26 - 144
4,4'-DDT	0.400	0.2615		ug/L		65	25 - 160
Endrin aldehyde	0.400	0.2710		ug/L		68	18 - 136

Method: 608 - Organochlorine Pesticides/PCBs in Water (Continued)

Lab Sample ID: LCS 500-736320/2-A
Matrix: Water
Analysis Batch: 736508

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 736320

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*55*		*30 - 131*
Tetrachloro-m-xylene	*53*		*44 - 120*

Lab Sample ID: LCSD 500-736320/3-A
Matrix: Water
Analysis Batch: 736508

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 736320

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
beta-BHC	0.400	0.2747		ug/L		69	17 - 147	4	20
delta-BHC	0.400	0.2683		ug/L		67	32 - 127	3	20
gamma-BHC (Lindane)	0.400	0.2614		ug/L		65	19 - 140	3	20
Heptachlor	0.400	0.2620		ug/L		65	34 - 111	3	20
Aldrin	0.400	0.2416		ug/L		60	42 - 122	2	20
Heptachlor epoxide	0.400	0.2739		ug/L		68	37 - 142	4	20
Endosulfan I	0.400	0.2551		ug/L		64	45 - 153	3	20
Dieldrin	0.400	0.2687		ug/L		67	36 - 146	1	20
4,4'-DDE	0.400	0.2512		ug/L		63	30 - 145	3	20
Endrin	0.400	0.2694		ug/L		67	30 - 147	2	20
Endosulfan II	0.400	0.2792		ug/L		70	10 - 202	4	20
4,4'-DDD	0.400	0.2798		ug/L		70	31 - 141	3	20
Endosulfan sulfate	0.400	0.2675		ug/L		67	26 - 144	2	20
4,4'-DDT	0.400	0.2779		ug/L		69	25 - 160	6	20
Endrin aldehyde	0.400	0.2859		ug/L		71	18 - 136	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*61*		*30 - 131*
Tetrachloro-m-xylene	*53*		*44 - 120*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 310-402211/3
Matrix: Water
Analysis Batch: 402211

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	0.450	mg/L			10/09/23 15:49	1
Sulfate	<1.00		1.00	0.420	mg/L			10/09/23 15:49	1

Lab Sample ID: LCS 310-402211/4
Matrix: Water
Analysis Batch: 402211

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	9.470		mg/L		95	90 - 110
Sulfate	10.0	9.802		mg/L		98	90 - 110

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 310-401522/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401963 — **Prep Batch: 401522**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200	0.000530	mg/L		10/05/23 09:10	10/09/23 14:30	1
Barium	<0.00200		0.00200	0.000640	mg/L		10/05/23 09:10	10/09/23 14:30	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		10/05/23 09:10	10/09/23 14:30	1
Chromium	<0.00500		0.00500	0.00110	mg/L		10/05/23 09:10	10/09/23 14:30	1
Copper	<0.00500		0.00500	0.00180	mg/L		10/05/23 09:10	10/09/23 14:30	1
Iron	<0.100		0.100	0.0360	mg/L		10/05/23 09:10	10/09/23 14:30	1
Lead	<0.000500		0.000500	0.000240	mg/L		10/05/23 09:10	10/09/23 14:30	1
Nickel	<0.00500		0.00500	0.00190	mg/L		10/05/23 09:10	10/09/23 14:30	1
Selenium	<0.00500		0.00500	0.00140	mg/L		10/05/23 09:10	10/09/23 14:30	1
Silver	<0.00100		0.00100	0.000500	mg/L		10/05/23 09:10	10/09/23 14:30	1
Zinc	<0.0200		0.0200	0.00640	mg/L		10/05/23 09:10	10/09/23 14:30	1

Lab Sample ID: LCS 310-401522/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401963 — **Prep Batch: 401522**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.200	0.2105		mg/L		105	85 - 115
Barium	0.100	0.1065		mg/L		106	85 - 115
Cadmium	0.100	0.1048		mg/L		105	85 - 115
Chromium	0.100	0.1087		mg/L		109	85 - 115
Iron	0.200	0.2132		mg/L		107	85 - 115
Lead	0.200	0.2122		mg/L		106	85 - 115
Nickel	0.200	0.2173		mg/L		109	85 - 115
Selenium	0.400	0.4099		mg/L		102	85 - 115
Silver	0.100	0.1035		mg/L		103	85 - 115
Zinc	0.200	0.2025		mg/L		101	85 - 115

Method: 245.2 - Mercury (CVAA)

Lab Sample ID: MB 310-401754/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401947 — **Prep Batch: 401754**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		10/06/23 10:47	10/09/23 10:48	1

Lab Sample ID: LCS 310-401754/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401947 — **Prep Batch: 401754**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001687		mg/L		101	85 - 115

Method: 1664A - HEM and SGT-HEM by Extraction and Gravimetry

Lab Sample ID: MB 310-401551/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401645 — **Prep Batch: 401551**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HEM (Oil & Grease)	<5.0		5.0	4.5	mg/L		10/05/23 07:54	10/05/23 07:54	1

Lab Sample ID: LCS 310-401551/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401645 — **Prep Batch: 401551**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
HEM (Oil & Grease)	40.0	33.10		mg/L		83	78 - 114

Method: 335.4 - Cyanide, Total

Lab Sample ID: MB 310-401591/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401669 — **Prep Batch: 401591**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	<0.0100		0.0100	0.00430	mg/L		10/05/23 09:23	10/05/23 19:34	1

Lab Sample ID: LCS 310-401591/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401669 — **Prep Batch: 401591**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.200	0.1796		mg/L		90	90 - 110

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 310-401565/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401670 — **Prep Batch: 401565**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	<0.500		0.500	0.220	mg/L		10/05/23 08:32	10/05/23 23:03	1

Lab Sample ID: LCS 310-401565/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401670 — **Prep Batch: 401565**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	4.00	4.062		mg/L		101	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 310-401542/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401662 — **Prep Batch: 401542**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Kjeldahl Nitrogen	<1.00		1.00	0.550	mg/L		10/05/23 07:23	10/05/23 16:23	1

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: LCS 310-401542/25-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401662 — **Prep Batch: 401542**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Kjeldahl Nitrogen	4.01	3.860		mg/L		96	90 - 110

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 310-401507/44 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401507

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	0.06180	J	0.100	0.0540	mg/L			10/04/23 14:17	1

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-401506/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401506

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			10/04/23 15:36	1

Lab Sample ID: LCS 310-401506/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401506

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	93.00		mg/L		93	75 - 116

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

Lab Sample ID: MB 310-401649/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0	34.0	mg/L			10/05/23 14:56	1

Lab Sample ID: LCS 310-401649/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 401649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1014		mg/L		101	90 - 110

Method: SM 3500 CR B - Chromium, Hexavalent

Lab Sample ID: MB 310-401291/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Dissolved**
Analysis Batch: 401318

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent (as Cr)	<0.0200		0.0200	0.0100	mg/L			10/03/23 11:56	1

QC Sample Results

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Method: SM 3500 CR B - Chromium, Hexavalent

Lab Sample ID: LCS 310-401291/2-A
Matrix: Water
Analysis Batch: 401318

Client Sample ID: Lab Control Sample
Prep Type: Dissolved

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent (as Cr)	0.801	0.7203		mg/L		90	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-401298/1
Matrix: Water
Analysis Batch: 401298

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		101	98 - 102

Method: SM 5210B - BOD, 5-Day

Lab Sample ID: USB 310-401374/1
Matrix: Water
Analysis Batch: 401374

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	3.00	mg/L			10/04/23 06:05	1

Lab Sample ID: LCS 310-401374/2
Matrix: Water
Analysis Batch: 401374

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	187.6		mg/L		95	85 - 115

Method: SM 5310C - TOC

Lab Sample ID: MB 500-737455/6
Matrix: Water
Analysis Batch: 737455

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	0.470	mg/L			10/16/23 13:49	1

Lab Sample ID: LCS 500-737455/7
Matrix: Water
Analysis Batch: 737455

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TOC Result 1	10.0	10.17		mg/L		102	86 - 116
TOC Result 2	10.0	10.18		mg/L		102	86 - 116
TOC Result 3	10.0	10.21		mg/L		102	86 - 116
Total Organic Carbon	10.0	10.18		mg/L		102	86 - 116

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

GC/MS VOA

Analysis Batch: 401578

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	624.1	
MB 310-401578/5	Method Blank	Total/NA	Water	624.1	
LCS 310-401578/6	Lab Control Sample	Total/NA	Water	624.1	
LCS 310-401578/7	Lab Control Sample	Total/NA	Water	624.1	

GC/MS Semi VOA

Prep Batch: 401372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	625	
MB 310-401372/1-A	Method Blank	Total/NA	Water	625	
LCS 310-401372/2-A	Lab Control Sample	Total/NA	Water	625	
LCSD 310-401372/3-A	Lab Control Sample Dup	Total/NA	Water	625	

Analysis Batch: 401587

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	625.1	401372
MB 310-401372/1-A	Method Blank	Total/NA	Water	625.1	401372
LCS 310-401372/2-A	Lab Control Sample	Total/NA	Water	625.1	401372
LCSD 310-401372/3-A	Lab Control Sample Dup	Total/NA	Water	625.1	401372

GC Semi VOA

Prep Batch: 736320

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	608	
MB 500-736320/1-A	Method Blank	Total/NA	Water	608	
LCS 500-736320/2-A	Lab Control Sample	Total/NA	Water	608	
LCSD 500-736320/3-A	Lab Control Sample Dup	Total/NA	Water	608	

Analysis Batch: 736508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 500-736320/1-A	Method Blank	Total/NA	Water	608	736320
LCS 500-736320/2-A	Lab Control Sample	Total/NA	Water	608	736320
LCSD 500-736320/3-A	Lab Control Sample Dup	Total/NA	Water	608	736320

Analysis Batch: 736938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	608	736320

HPLC/IC

Analysis Batch: 402211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	300.0	
310-266179-1	Leachate Lagoon	Total/NA	Water	300.0	
MB 310-402211/3	Method Blank	Total/NA	Water	300.0	
LCS 310-402211/4	Lab Control Sample	Total/NA	Water	300.0	

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Metals

Prep Batch: 401522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	200.8	
MB 310-401522/1-A	Method Blank	Total/NA	Water	200.8	
LCS 310-401522/2-A	Lab Control Sample	Total/NA	Water	200.8	

Prep Batch: 401754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	245.1	
MB 310-401754/1-A	Method Blank	Total/NA	Water	245.1	
LCS 310-401754/2-A	Lab Control Sample	Total/NA	Water	245.1	

Analysis Batch: 401947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	245.2	401754
MB 310-401754/1-A	Method Blank	Total/NA	Water	245.2	401754
LCS 310-401754/2-A	Lab Control Sample	Total/NA	Water	245.2	401754

Analysis Batch: 401963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	200.8	401522
MB 310-401522/1-A	Method Blank	Total/NA	Water	200.8	401522
LCS 310-401522/2-A	Lab Control Sample	Total/NA	Water	200.8	401522

General Chemistry

Filtration Batch: 401291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Dissolved	Water	Filtration	
MB 310-401291/1-A	Method Blank	Dissolved	Water	Filtration	
LCS 310-401291/2-A	Lab Control Sample	Dissolved	Water	Filtration	

Analysis Batch: 401298

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	SM 4500 H+ B	
LCS 310-401298/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 401318

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-401291/1-A	Method Blank	Dissolved	Water	SM 3500 CR B	401291
LCS 310-401291/2-A	Lab Control Sample	Dissolved	Water	SM 3500 CR B	401291

Analysis Batch: 401326

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Dissolved	Water	SM 3500 CR B	401291

Analysis Batch: 401374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	SM 5210B	
USB 310-401374/1	Method Blank	Total/NA	Water	SM 5210B	
LCS 310-401374/2	Lab Control Sample	Total/NA	Water	SM 5210B	

General Chemistry

Analysis Batch: 401506

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	I-3765-85	
MB 310-401506/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-401506/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 401507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	353.2	
MB 310-401507/44	Method Blank	Total/NA	Water	353.2	
LCS 310-401507/45	Lab Control Sample	Total/NA	Water	353.2	

Prep Batch: 401542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	351.2	
MB 310-401542/1-A	Method Blank	Total/NA	Water	351.2	
LCS 310-401542/25-A	Lab Control Sample	Total/NA	Water	351.2	

Prep Batch: 401551

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	1664A	
MB 310-401551/1-A	Method Blank	Total/NA	Water	1664A	
LCS 310-401551/2-A	Lab Control Sample	Total/NA	Water	1664A	

Prep Batch: 401565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	Distill/Ammonia	
MB 310-401565/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	
LCS 310-401565/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	

Prep Batch: 401591

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	Distill/CN	
MB 310-401591/1-A	Method Blank	Total/NA	Water	Distill/CN	
LCS 310-401591/2-A	Lab Control Sample	Total/NA	Water	Distill/CN	

Analysis Batch: 401645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	1664A	401551
MB 310-401551/1-A	Method Blank	Total/NA	Water	1664A	401551
LCS 310-401551/2-A	Lab Control Sample	Total/NA	Water	1664A	401551

Analysis Batch: 401649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	SM 2540C	
MB 310-401649/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-401649/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 401662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	351.2	401542
MB 310-401542/1-A	Method Blank	Total/NA	Water	351.2	401542
LCS 310-401542/25-A	Lab Control Sample	Total/NA	Water	351.2	401542

QC Association Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

General Chemistry

Analysis Batch: 401669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	335.4	401591
MB 310-401591/1-A	Method Blank	Total/NA	Water	335.4	401591
LCS 310-401591/2-A	Lab Control Sample	Total/NA	Water	335.4	401591

Analysis Batch: 401670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	350.1	401565
MB 310-401565/1-A	Method Blank	Total/NA	Water	350.1	401565
LCS 310-401565/2-A	Lab Control Sample	Total/NA	Water	350.1	401565

Analysis Batch: 737455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-266179-1	Leachate Lagoon	Total/NA	Water	SM 5310C	
MB 500-737455/6	Method Blank	Total/NA	Water	SM 5310C	
LCS 500-737455/7	Lab Control Sample	Total/NA	Water	SM 5310C	

Lab Chronicle

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Client Sample ID: Leachate Lagoon

Date Collected: 10/03/23 11:56
Date Received: 10/03/23 16:30

Lab Sample ID: 310-266179-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	624.1		1	401578	WSE8	EET CF	10/05/23 12:07
Total/NA	Prep	625			401372	Y6AF	EET CF	10/04/23 05:45
Total/NA	Analysis	625.1		1	401587	L0FS	EET CF	10/05/23 17:34
Total/NA	Prep	608			736320	DAK	EET CHI	10/10/23 17:46
Total/NA	Analysis	608		1	736938	SS	EET CHI	10/13/23 12:05
Total/NA	Analysis	300.0		100	402211	QTZ5	EET CF	10/09/23 09:12
Total/NA	Analysis	300.0		10	402211	QTZ5	EET CF	10/09/23 18:26
Total/NA	Prep	200.8			401522	KCK5	EET CF	10/05/23 09:10
Total/NA	Analysis	200.8		1	401963	A6US	EET CF	10/09/23 15:09
Total/NA	Prep	245.1			401754	NFT2	EET CF	10/06/23 10:47
Total/NA	Analysis	245.2		1	401947	NFT2	EET CF	10/09/23 11:05
Total/NA	Prep	1664A			401551	A3GU	EET CF	10/05/23 07:54
Total/NA	Analysis	1664A		1	401645	A3GU	EET CF	10/05/23 07:54
Total/NA	Prep	Distill/CN			401591	ENB7	EET CF	10/05/23 09:23
Total/NA	Analysis	335.4		1	401669	ZJX4	EET CF	10/05/23 19:42
Total/NA	Prep	Distill/Ammonia			401565	MQ8M	EET CF	10/05/23 08:32
Total/NA	Analysis	350.1		1	401670	ZJX4	EET CF	10/05/23 23:06
Total/NA	Prep	351.2			401542	W9YR	EET CF	10/05/23 07:23
Total/NA	Analysis	351.2		1	401662	ZJX4	EET CF	10/05/23 16:26
Total/NA	Analysis	353.2		10	401507	WZC8	EET CF	10/04/23 14:34
Total/NA	Analysis	I-3765-85		1	401506	A4XP	EET CF	10/04/23 15:36
Total/NA	Analysis	SM 2540C		1	401649	ENB7	EET CF	10/05/23 14:56
Dissolved	Filtration	Filtration			401291	HE7K	EET CF	10/03/23 16:55
Dissolved	Analysis	SM 3500 CR B		1	401326	HE7K	EET CF	10/03/23 17:28
Total/NA	Analysis	SM 4500 H+ B		1	401298	W9YR	EET CF	10/03/23 18:19
Total/NA	Analysis	SM 5210B		1	401374	W9YR	EET CF	10/04/23 06:46
Total/NA	Analysis	SM 5310C		40	737455	JAB	EET CHI	10/16/23 20:21

Laboratory References:

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

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

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

Analysis Method	Prep Method	Matrix	Analyte
624.1		Water	1,3-Dichloropropane
624.1		Water	1,3-Dichloropropene, Total
625.1	625	Water	1,2-Dichlorobenzene
625.1	625	Water	1,3-Dichlorobenzene
625.1	625	Water	1,4-Dichlorobenzene
625.1	625	Water	Dibenzofuran

Laboratory: Eurofins Chicago

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	082	05-01-24

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

Analysis Method	Prep Method	Matrix	Analyte
608	608	Water	4,4'-DDD
608	608	Water	4,4'-DDE
608	608	Water	4,4'-DDT
608	608	Water	Aldrin
608	608	Water	beta-BHC
608	608	Water	Chlordane (technical)
608	608	Water	delta-BHC
608	608	Water	Dieldrin
608	608	Water	Endosulfan I
608	608	Water	Endosulfan II
608	608	Water	Endosulfan sulfate
608	608	Water	Endrin
608	608	Water	Endrin aldehyde
608	608	Water	gamma-BHC (Lindane)
608	608	Water	Heptachlor
608	608	Water	Heptachlor epoxide
608	608	Water	PCB-1016
608	608	Water	PCB-1221
608	608	Water	PCB-1232
608	608	Water	PCB-1242
608	608	Water	PCB-1248
608	608	Water	PCB-1254
608	608	Water	PCB-1260
608	608	Water	Toxaphene
SM 5310C		Water	Total Organic Carbon

Method Summary

Client: SCS Engineers
Project/Site: Cass County Sanitary Landfill

Job ID: 310-266179-1

Method	Method Description	Protocol	Laboratory
624.1	Volatile Organic Compounds (GC/MS)	EPA	EET CF
625.1	Semivolatile Organic Compounds (GC/MS)	EPA	EET CF
608	Organochlorine Pesticides/PCBs in Water	EPA	EET CHI
300.0	Anions, Ion Chromatography	EPA	EET CF
200.8	Metals (ICP/MS)	EPA	EET CF
245.2	Mercury (CVAA)	EPA	EET CF
1664A	HEM and SGT-HEM by Extraction and Gravimetry	40CFR136A	EET CF
335.4	Cyanide, Total	EPA	EET CF
350.1	Nitrogen, Ammonia	EPA	EET CF
351.2	Nitrogen, Total Kjeldahl	EPA	EET CF
353.2	Nitrogen, Nitrate-Nitrite	EPA	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 3500 CR B	Chromium, Hexavalent	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
SM 5210B	BOD, 5-Day	SM	EET CF
SM 5310C	TOC	SM	EET CHI
1664A	HEM and SGT-HEM (SPE)	1664A	EET CF
200.8	Preparation, Total Metals	EPA	EET CF
245.1	Preparation, Mercury	EPA	EET CF
351.2	Nitrogen, Total Kjeldahl	EPA	EET CF
608	Liquid-Liquid Extraction (Separatory Funnel)	EPA	EET CHI
625	Liquid-Liquid Extraction	EPA	EET CF
Distill/Ammonia	Distillation, Ammonia	None	EET CF
Distill/CN	Distillation, Cyanide	None	EET CF
Filtration	Sample Filtration	None	EET CF

Protocol References:

1664A = EPA-821-98-002

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

None = None

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

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

eurofins | Environment Testing America

310-266179 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE IA | Project:

Receipt Information

Date/Time Received: DATE 10 8-23 | TIME 1630 | Received By: MC

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 # _____ 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: R | Correction Factor (°C): 0

• **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): 1.6

• **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

3019 Venture Way
Cedar Falls, Iowa 50613

319 277 2401 (phone)
515 792 7989 (fax)

SAMPLER: SCS Engineers
SITE NAME: Cass County Sanitary Landfill
ADDRESS:
CITY/STATE/ZIP:
TELEPHONE NUMBER: Fax:
SAMPLED BY (PRINT NAME): Caleb Gomez
SIGNATURE: Caleb Gomez

REPORT TO:
NAME: Nathan Ohrt
COMPANY NAME: SCS Engineers
PROJECT NAME: Cass County Sanitary Landfill (2023 Leachate Sample-Corning & Atlantic)
PROJECT NUMBER: 27223099.00
ADDRESS: 1690 All State Court, Suite 100
CITY/STATE/ZIP: West Des Moines, IA 50265

								Preservative								Matrix						Analyze For:														
Sample ID	# of Containters Ordered	Date Sampled	Time Sampled	# of Containers Shipped	Grab	Composite	Field Filtered	Ice	HNO (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)	Trip Blank	Groundwater	Wastewater	Drinking Water	Sludge	Soil	Trip Blank	BOD_5	Cyanide	Total Suspended Solids	Total Kjeldahl Nitrogen	Ammonia Nitrogen as N	Oil and Grease	Total Metals (HG, NI, AS, SE, AG, CU, PB, ZN, CD)	Chromium, Hexavalent (as CR)	Attached Requirements*	Chloride	Sulfate	p-Cresol	Phenol		Fax Results
Leachate Lagoon		10/3	11:56			X		X									X					X	X	X	X	X	X	X	X	X	X	X	X	X		

Relinquished by:	Date:	Time:	Received by:	Date	Time	Relinquished by:
Caleb Gomez	10/3/23	14:30				

Shipped Via:
Comments: * Analyze for all constituents on attached sheet.
Shipped Via:

Received for lab by:	Date:	Time:	Temperature Upon Receipt
MC	10-3-23	1630	

Laboratory Comments: (1) For Appendix and analysis report to the reporting limits, not the detection limits. Make sure that the reporting limits are below the EPA's MCLs.
(2) For analysis other than Appendix and report to the detection limits. Please make sure that the detection limits are below the EPA MCLs.
(3) In the "Result column for all EDD files, when non detect, please report "<" the reporting limits or the detection limits instead of indicating with "ND"

Eurofins 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: Liechti Meredith L	Carrier Tracking No(s):	COC No. 310-65960 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: meredith liechti@et.eurofinsus.com	State of Origin: Iowa	Page Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State Program - Iowa		Job #: 310-266179-1
Address: 2417 Bond Street,	Due Date Requested: 10/16/2023			
City: University Park	TAT Requested (days):			
State, Zip: IL, 60484				
Phone: 708-534-5200(Tel) 708-534-5211(F	PO #:			
Email:	WO #:			
Project Name: Cass County Sanitary Landfill	Project #: 31002404			
Site:	SSOW#:			

310-266179 COC

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
Y Trizma
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/ (MOD) TOC	608/608_Prep (MOD) Priority Pollutants	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X			X	
Leachate Lagoon (310-266179-1)	10/3/23	11 56 Central		Water			X	X	5	

Note Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central LLC places the ownership of method analyte & accreditation compliance upon our 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 Eurofins Environment Testing North Central LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central LLC attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central LLC

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	Company	Received by	Date/Time	Company
[signature]	10/4/23 1610		[signature]	10/5/23 0930	BFTA
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. 4.2 → 4.0

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-266179-1

Login Number: 266179

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Costello, Mackenzie K

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-266179-1

Login Number: 266179
List Number: 2
Creator: Scott, Sherri L

List Source: Eurofins Chicago
List Creation: 10/05/23 02:08 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	4.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	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 F

2023 Landfill Gas Annual Report

Table F1
Gas Monitoring Summary
2023 Gas Monitoring Report
Cass County Landfill
Permit No. 15-SDP-01-75P

Monitoring Points				Methane Results (% LEL)									
	Name	Type	Description	12/6/2022	S (Y/N)	3/1/2023	S (Y/N)	5/17/2023	S (Y/N)	9/30/2023	S (Y/N)	12/18/2023	S (Y/N)
#1	NE Corner - Removed	Outdoor	Northeast corner of Landfill	0%		0%		0%					
#2	NW Corner - Removed	Outdoor	Northwest corner of Landfill	0%		0%		0%					
#3	SW Corner - Removed	Outdoor	Southwest corner of Landfill	0%		0%		0%					
#4	SE Corner - Removed	Outdoor	Southeast corner approximately 500' E of SE corner of closed area	0%		0%		0%					
#5	Building NW of Baler Building	Indoor	Inside building NW of Baler Building	0%		0%		0%		0%		0%	
#6	Scale	Outdoor	Beneath scale	0%		0%		0%		0%		0%	
#7	North Maintenance Shed	Indoor	North Maintenance Shed Building	0%		0%		0%		0%		0%	
#8	Office	Indoor	Scale House Office	0%		0%		0%		0%		0%	
#9	Baler	Indoor	Baler building	0%		0%		0%		0%		0%	
#10	RCC Receiving	Indoor	RCC Receiving Building	0%		0%		0%		0%		0%	
#11	MW-10	Subsurface	Subsurface MW-10	0%	N	0%	N	0%	N	0%	N	0%	N
#12	MW-12	Subsurface	Subsurface MW-12	0%	N	0%	N	0%	N	0%	N	0%	N
#13	MW-15R	Subsurface	Subsurface MW-15R	0%	N	0%	Y	0%	Y	0%	Y	0%	Y
#14	MW-31	Subsurface	Subsurface MW-31	0%	N	0%	N	0%	N	0%	N	0%	N
#15	LFGW-W1	Subsurface	Subsurface LFGW-1	0%	N	0%	N	0%	N	0%	N	0%	N
#16	MW-35	Subsurface	Subsurface MW-35	0%	N	0%	Y	0%	Y	0%	Y	0%	Y
#17	MW-39	Subsurface	Subsurface MW-39	0%	N	0%	Y	0%	N	0%	N	0%	Y
#18	GUCO-1	Subsurface	Underdrain cleanout Phase 2 east	0%		0%		0%		0%		0%	
#19	GUCO-2	Subsurface	Underdrain cleanout Phase 2 west	0%		0%		0%		0%		0%	

S(Y/N) - Was screen submerged, yes or no.

1) Removal of ambient monitoring points #1, #2, #3, and #4 from the landfill gas monitoring network was approved by the DNR on June 8, 2023 (Doc #106958).

Monitoring Points			
	Name	Type	Description
#1	NE Corner	Outdoor	Northeast corner of Landfill
#2	NW Corner	Outdoor	Northwest corner of Landfill
#3	SW Corner	Outdoor	Southwest corner of Landfill
#4	SE Corner	Outdoor	Southeast corner approximately 500' E of SE corner of closed area
#5	Building NW of Baler Building	Indoor	Inside building NW of Baler Building
#6	Scale	Outdoor	Beneath scale
#7	North Maintenance Shed	Indoor	North Maintenance Shed Building
#8	Office	Indoor	Scale House Office
#9	Baler	Indoor	Baler building
#10	RCC Receiving	Indoor	RCC Receiving Building
#11	MW-10	Subsurface	Subsurface MW-10
#12	MW-12	Subsurface	Subsurface MW-12
#13	MW-15R	Subsurface	Subsurface MW-15R
#14	MW-31	Subsurface	Subsurface MW-31
#15	LFGW-W1	Subsurface	Subsurface LFGW-1
#16	MW-35	Subsurface	Subsurface MW-35
#17	MW-39	Subsurface	Subsurface MW-39
#18	GUCO-1	Outdoor	Underdrain cleanout Phase 2 east
#19	GUCO-2	Outdoor	Underdrain cleanout Phase 2 west

SCS ENGINEERS
environmental consultants and contractors

Methane Monitoring Network

Legend

- Methane Monitoring Location
- Approximate Monitoring Well Location
- Approximate Groundwater Underdrain Location
- Approximate Groundwater Piezometer Location
- Approximate Leachate Piezometer
- Approximate Landfill Gas Monitoring Location
- Approximate Current Waste Boundary
- Approximate Property Boundary

Cass County Sanitary Landfill
Atlantic, Iowa
Project No: 27223098.24
Drawing Date: December 2023

Figure 1

N
W E
S

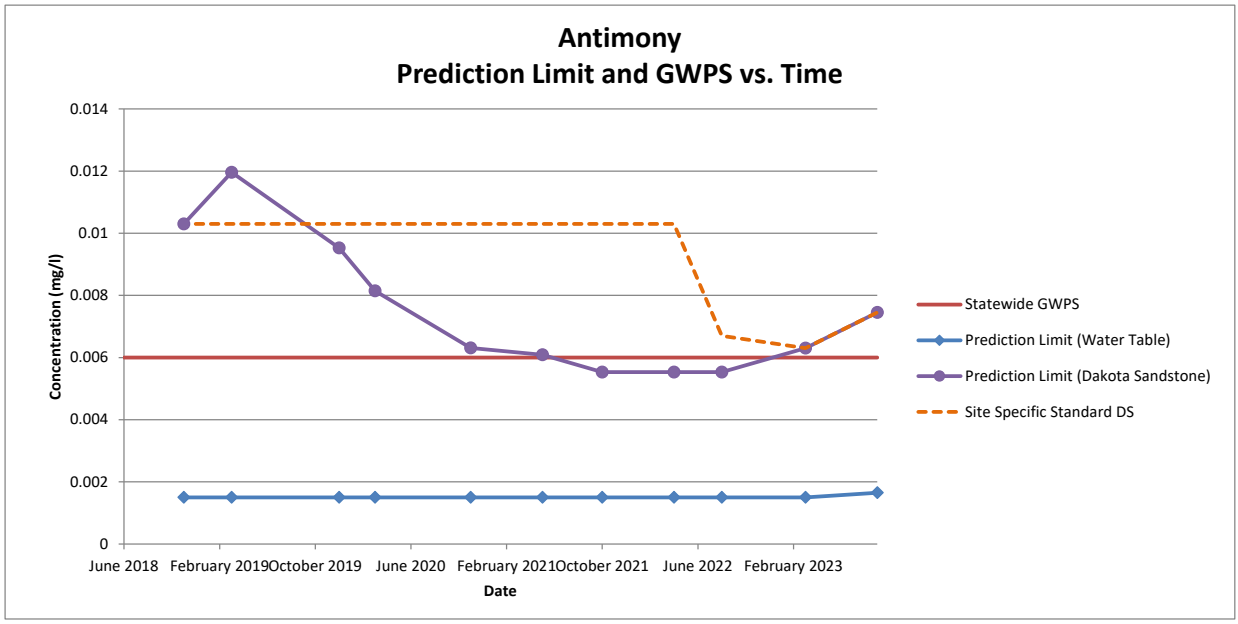
0 255 510 1,020 Feet

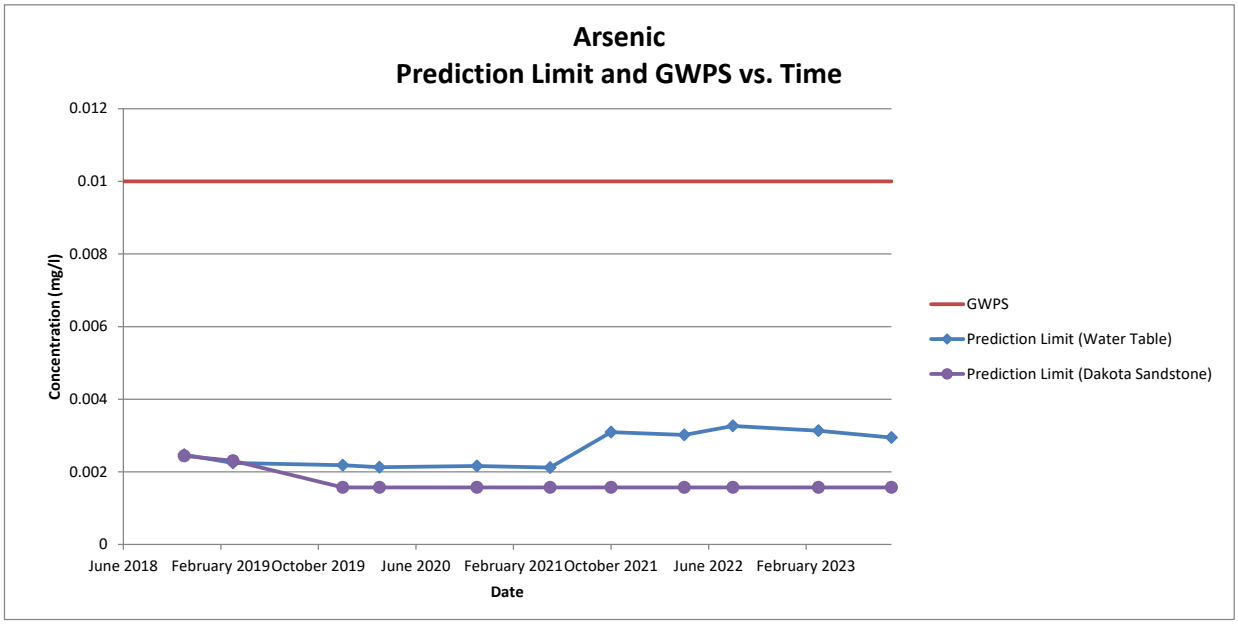
GEODATA, Esri, HERE, Garmin, Foursquare, FAO, METI/NASA, USGS, Esri, CGIAR, USGS

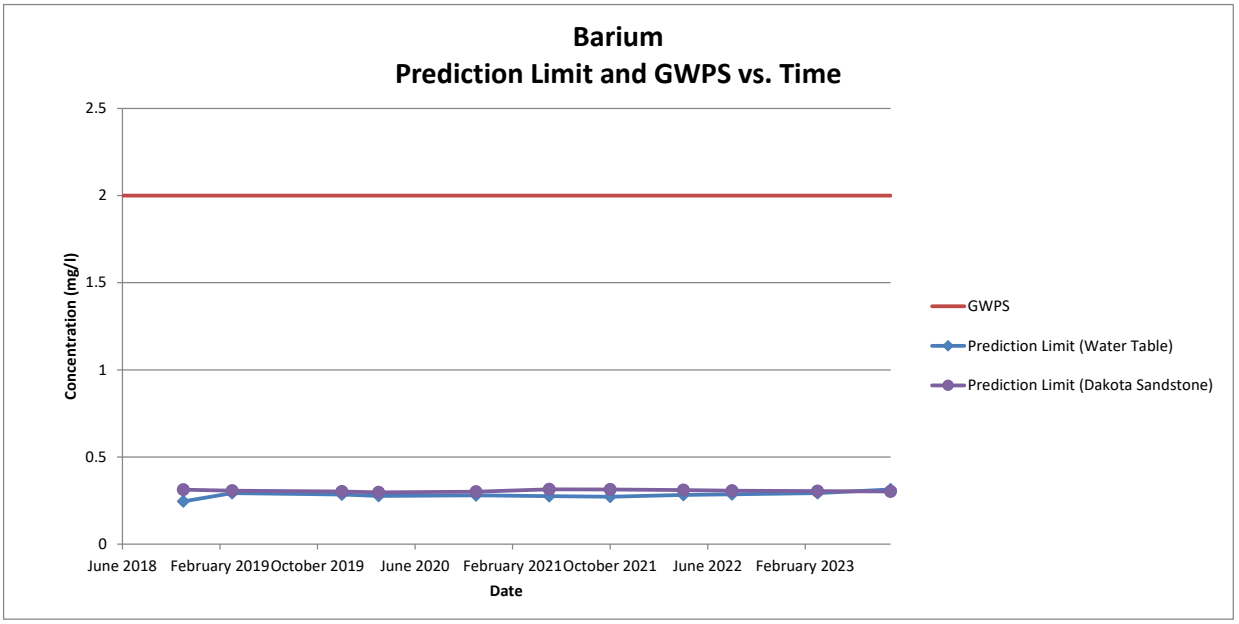
Path: C:\Users\bmadson\OneDrive - SCS Engineers\Desktop\GIS\Maps\Site Maps\CASSC 2023 AWOR\CASSC-2023-AWOR.aprx
User: bmadson
Date Saved: 12/29/2023 10:22 AM

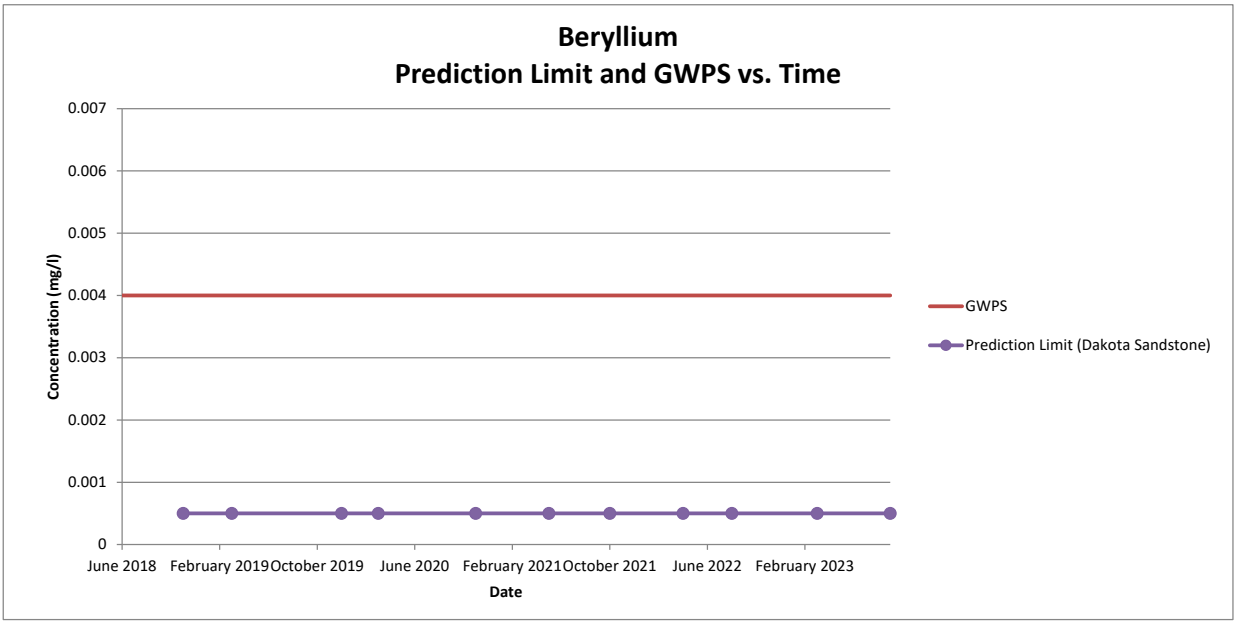
Appendix G

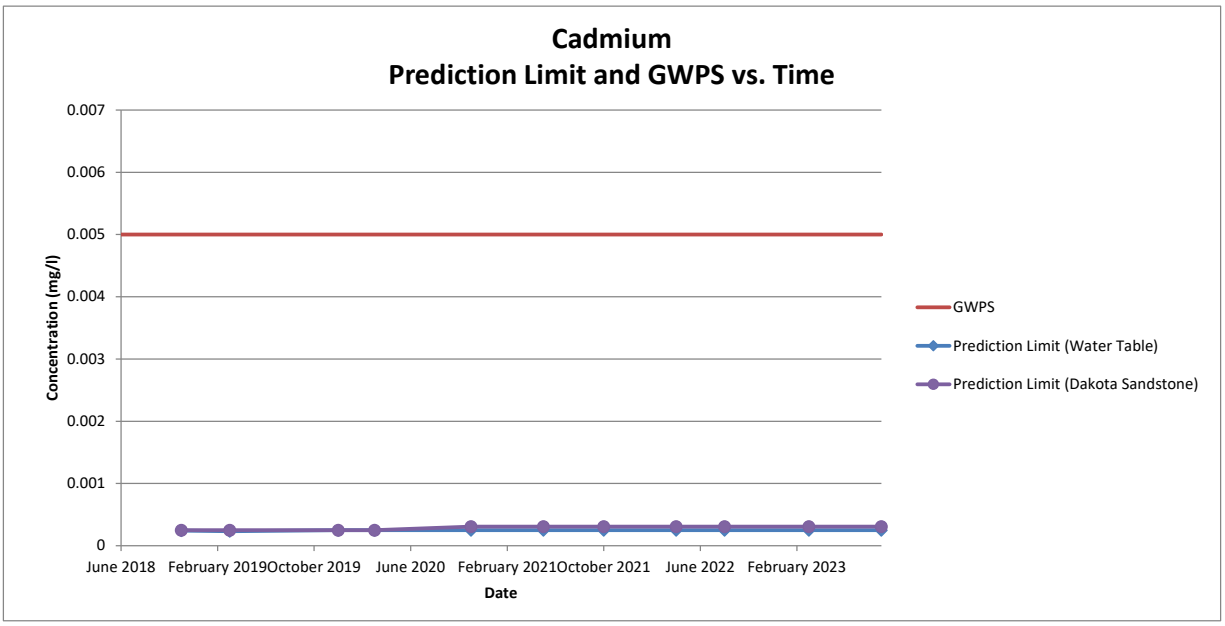
Standards History Graphs

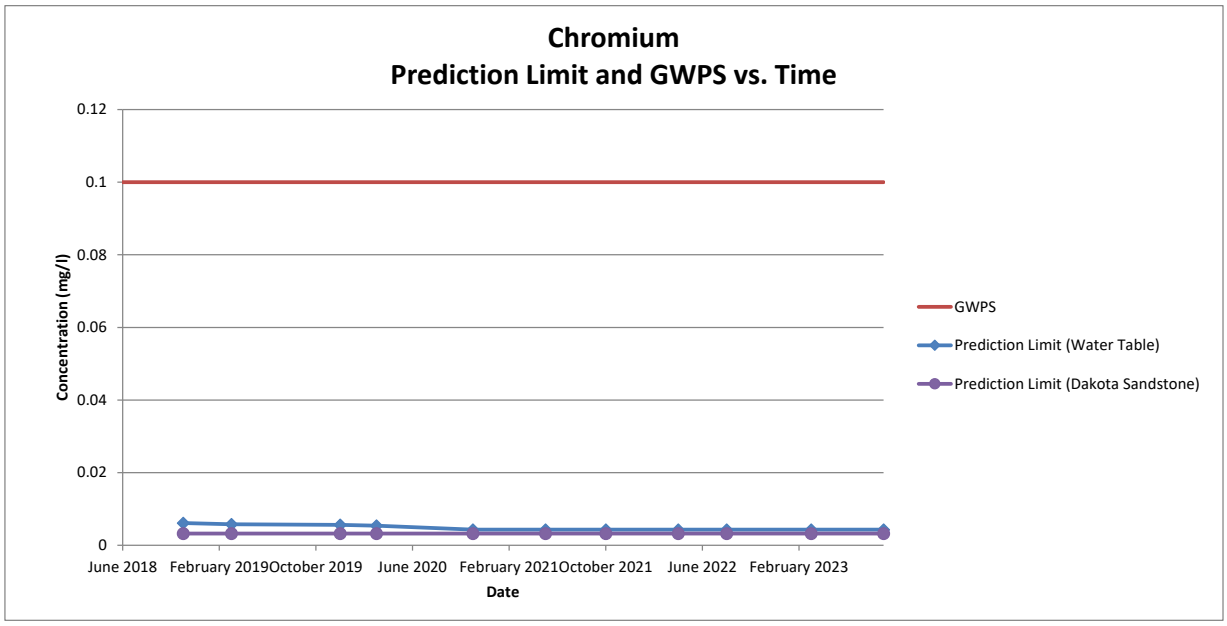

Antimony
Prediction Limit and GWPS vs. Time
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
Statewide GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)
Site Specific Standard DS

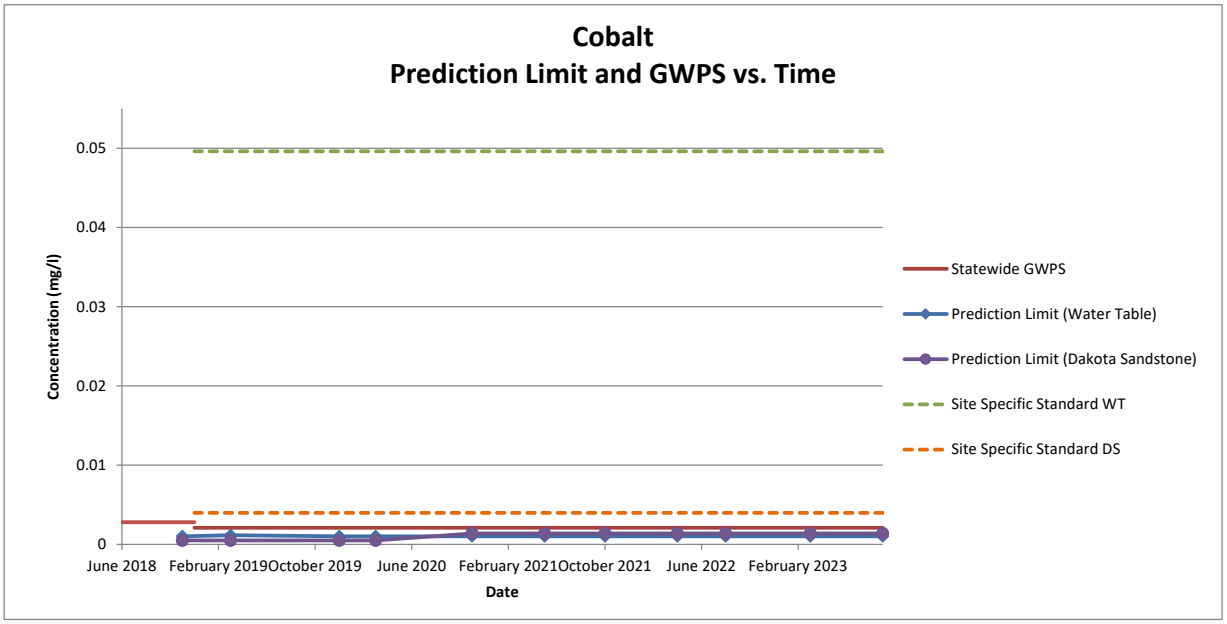

Arsenic
Prediction Limit and GWPS vs. Time
0.012
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)

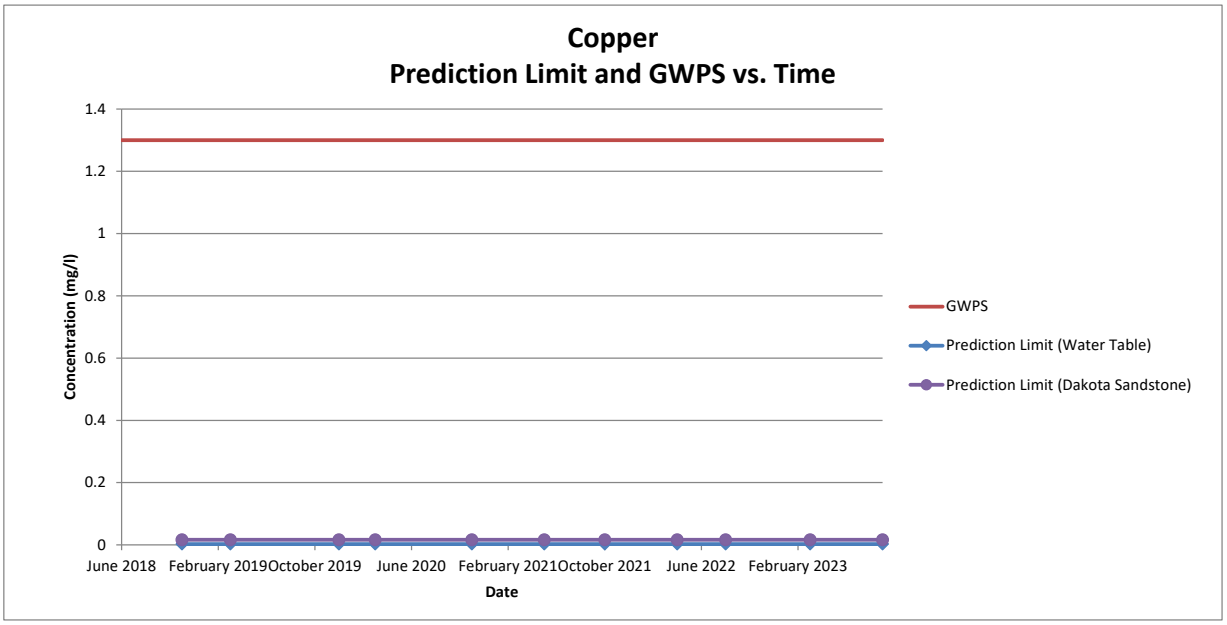

Barium
Prediction Limit and GWPS vs. Time
Concentration (mg/l)
2.5
2
1.5
1
0.5
0
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)

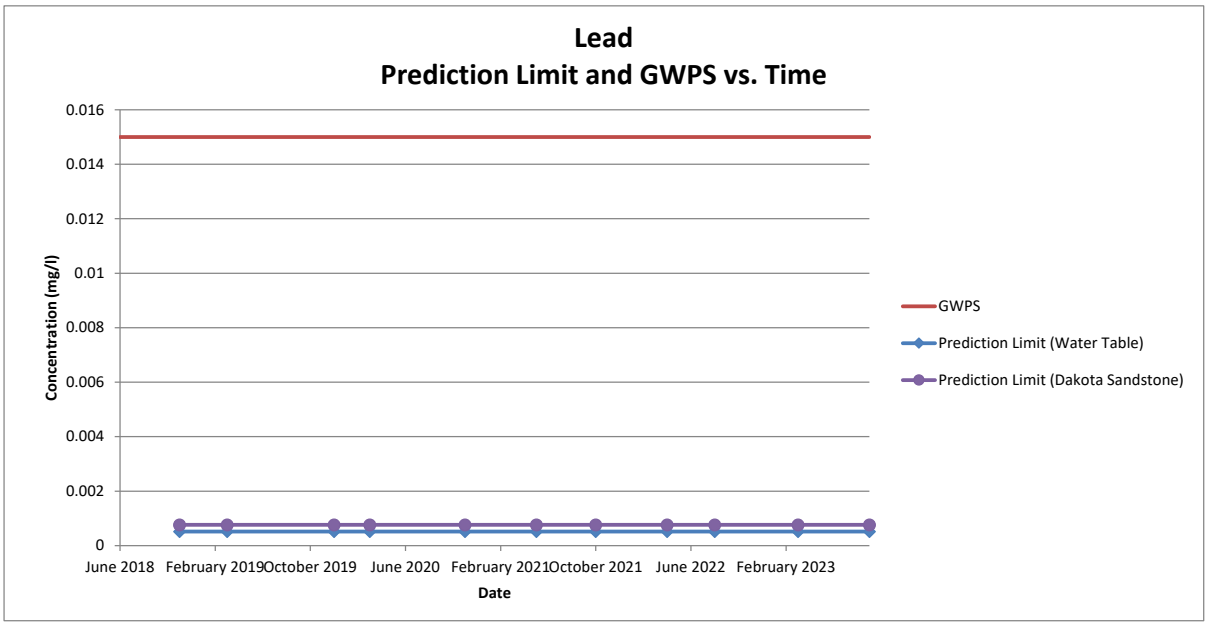

Beryllium
Prediction Limit and GWPS vs. Time
Concentration (mg/l)
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Dakota Sandstone)

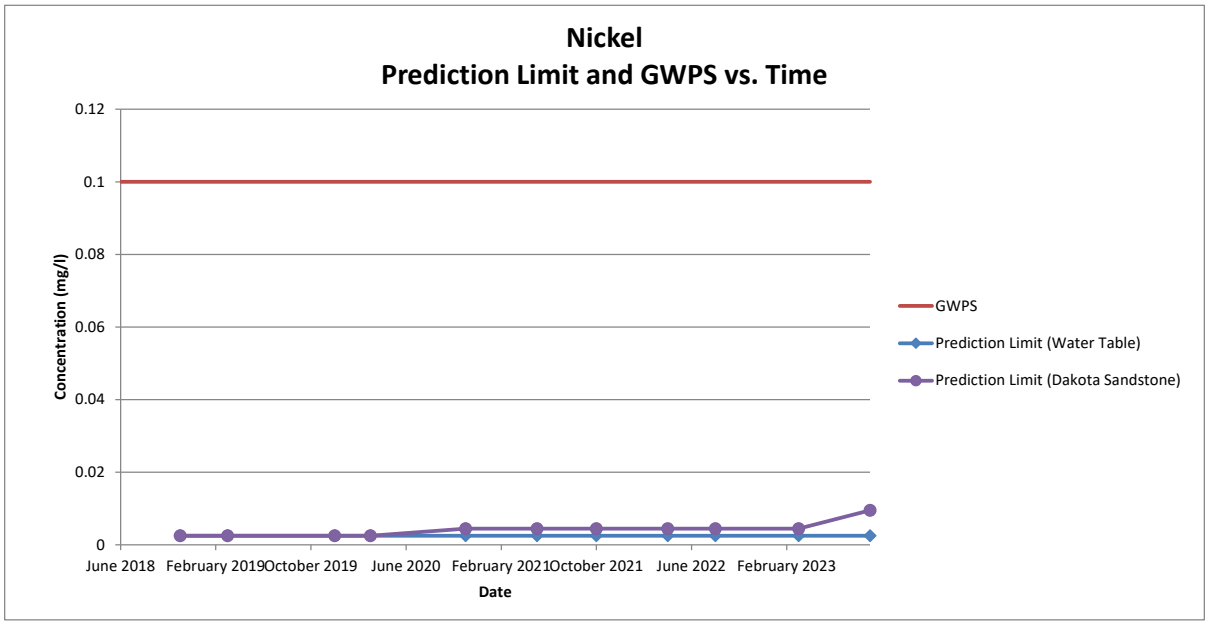

Cadmium
Prediction Limit and GWPS vs. Time
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)

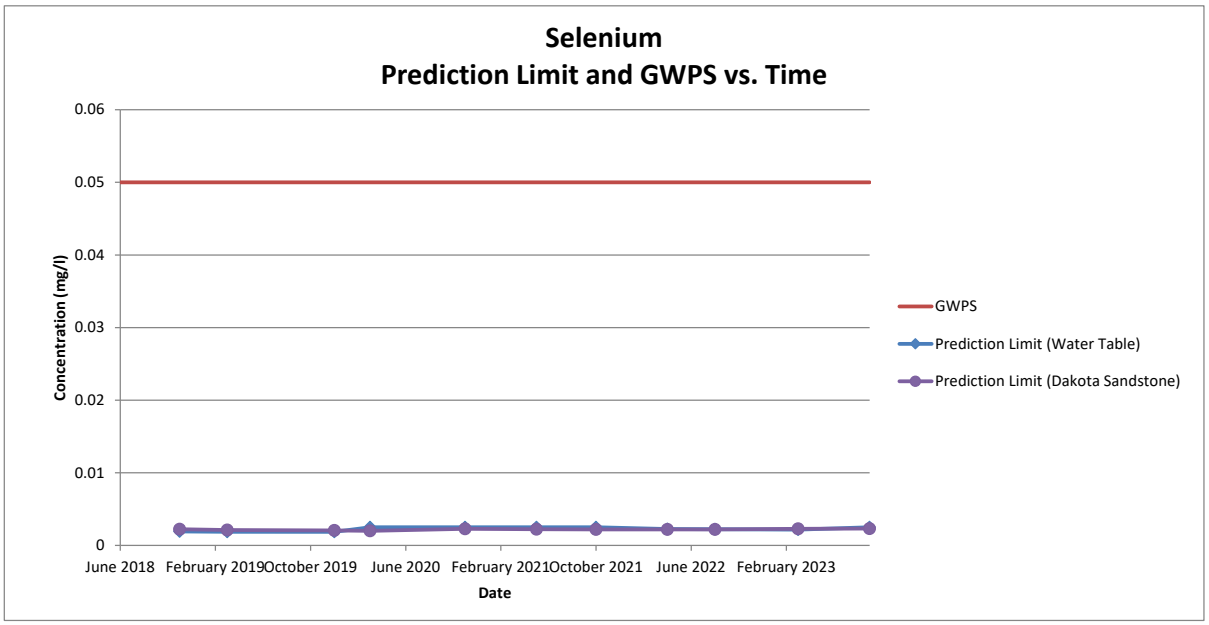

Chromium
Prediction Limit and GWPS vs. Time
0.12
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)

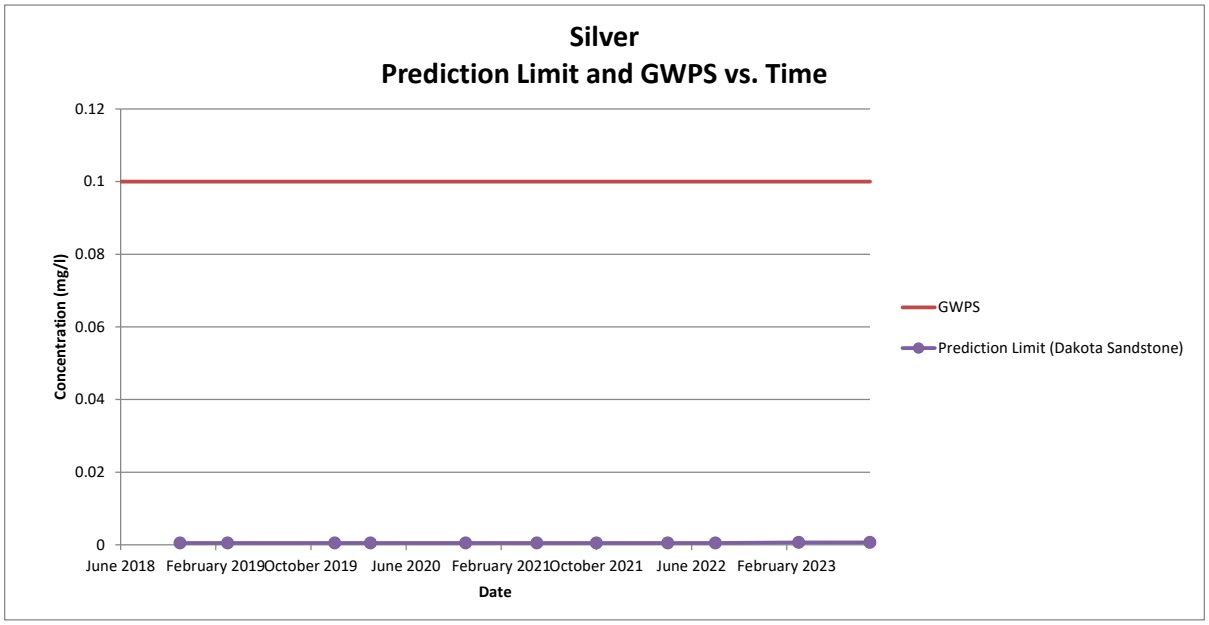

Cobalt
Prediction Limit and GWPS vs. Time
Concentration (mg/l)
0.05
0.04
0.03
0.02
0.01
0
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
Statewide GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)
Site Specific Standard WT
Site Specific Standard DS

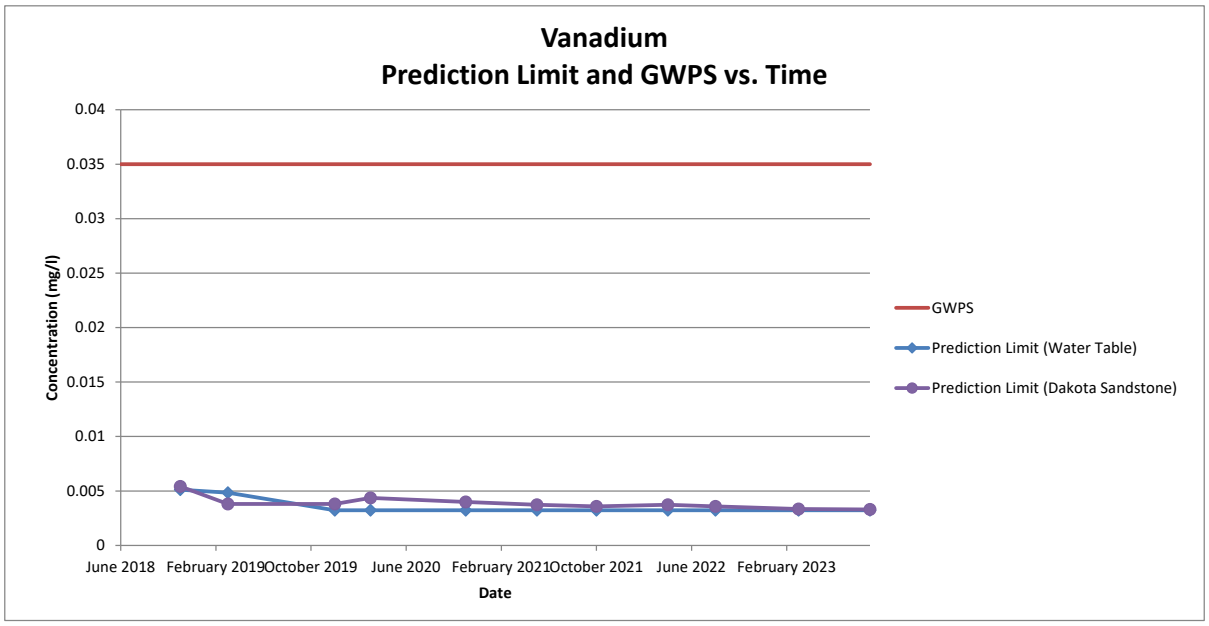

Copper
Prediction Limit and GWPS vs. Time
Concentration (mg/l)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)

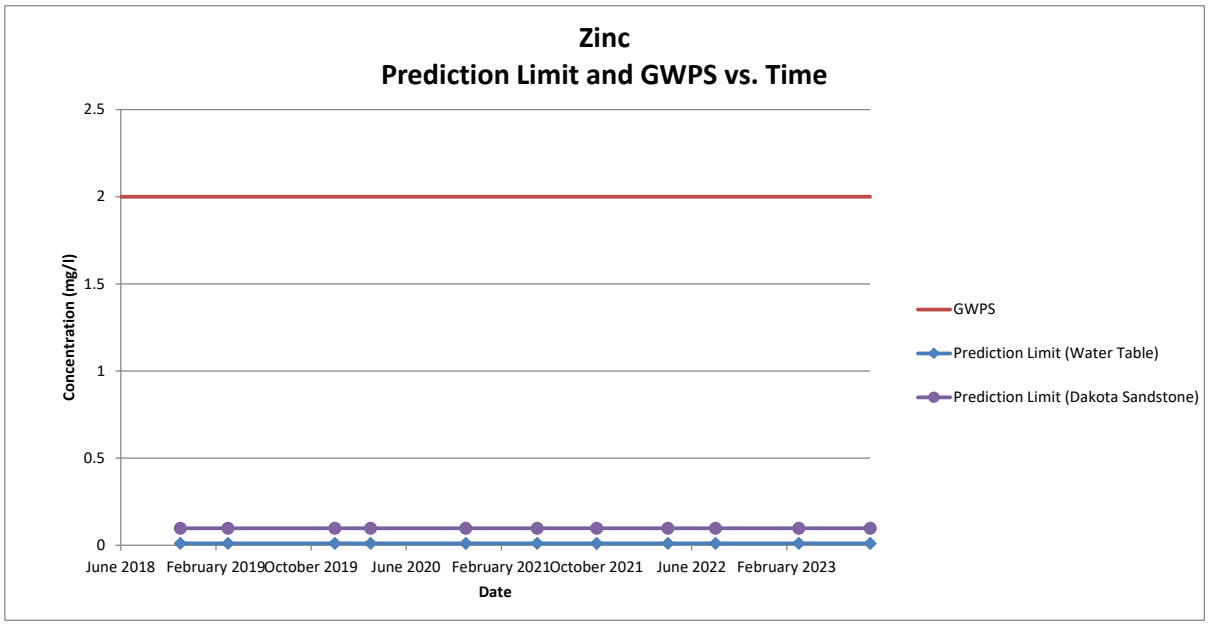

Lead
Prediction Limit and GWPS vs. Time
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)


Nickel
Prediction Limit and GWPS vs. Time
0.12
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)


Selenium
Prediction Limit and GWPS vs. Time
0.06
0.05
0.04
0.03
0.02
0.01
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)


Silver
Prediction Limit and GWPS vs. Time
0.12
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Dakota Sandstone)


Vanadium
Prediction Limit and GWPS vs. Time
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)


Zinc
Prediction Limit and GWPS vs. Time
2.5
2
1.5
1
0.5
0
Concentration (mg/l)
June 2018
February 2019
October 2019
June 2020
February 2021
October 2021
June 2022
February 2023
Date
GWPS
Prediction Limit (Water Table)
Prediction Limit (Dakota Sandstone)