July 30, 2024 ***TRANSMITTAL VIA EMAIL 07/30/2024***

Ms. Lori Babcock
Michigan Department of Environment, Great Lakes, and Energy
Materials Management Division
Bay City District Office
401 Ketchum St, Suite B
Bay City, Michigan 48708

SUBJECT: Semiannual Progress Report – Selection of Final Remedy pursuant to §257.97(a)
JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residuals (CCR) Units

Dear Ms. Babcock:

This Semiannual Progress Report, prepared as a requirement of §257.97(a) of the Federal Coal Combustion Residual (CCR) Rule, describes progress towards selecting and implementing any additional remedy for the Weadock Landfill after the completion of the Assessment of Corrective Measures, JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Unit[1], dated September 11, 2019. Groundwater management alternatives considered to be technically feasible at the Weadock Landfill upon completing source containment through the construction of the soil-bentonite slurry wall and construction of an impermeable final cover system that could potentially address the residual arsenic under *known* groundwater conditions were identified in the report as: 1) Post-remedy monitoring, 2) Groundwater capture/control, 3) Impermeable barrier, 4) Active geochemical sequestration, and 5) Passive geochemical sequestration.

Weadock Landfill Closure Activities

In 2008, Consumers Energy completed construction of a soil-bentonite slurry wall (Weadock Slurry Wall) that enclosed the landfill except for a 1,600 ft venting feature[2]. Later in 2018, construction of the Weadock Slurry Wall was extended to include the previous vent[3]. EGLE approved the construction certification reports on June 24, 2009, and December 19, 2018, respectively. This engineered barrier is monitored in accordance with the *Landfill Hydrogeological Monitoring Plan*[4], prepared by TRC, dated February 2021 approved and incorporated by reference into the renewed Solid Waste Operating License No. 9640 dated March 11, 2021.

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[1] TRC. 2019. Assessment of Corrective Measures – JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Units. Prepared for Consumers Energy Company. September.

[2] NTH Consultants, Ltd. 2009. Construction Certification, Soil-Bentonite Cutoff Wall April 24.

[3] Golder Associates, Inc. 2018. J.C. Weadock Generating Facility, Slurry Wall Vent Closure Construction Documentation Report. October 30.

[4] TRC. 2021. Landfill Hydrogeological Monitoring Plan – JC Weadock Power Plant, Essexville, Michigan. Prepared for Consumers Energy Company. February.

Additionally, Consumers Energy submitted draft revisions of the closure plan (2016 Closure Plan) for the Weadock Landfill to EGLE for review and concurrence pursuant to the requirements of solid waste operating license. Changes in the closure plan were required due to the forecasted early retirement of coal-fired units at the generating complex in May 2023. Final grades were proposed to be reduced, but other improvements to the final cover system and stormwater drainage were incorporated into the plan with state-specific variances requested. EGLE approved the variances and provisional design elements in the renewed solid waste operating license on March 11, 2021. The final closure plan was approved by EGLE on April 17, 2022. Consumers Energy will update the final closure plan pursuant to 257.102(d) once the detail engineering is completed.

Weadock Landfill Groundwater Sampling Results: March and May 2024 Events

Statistical analysis from the quarterly groundwater monitoring events performed in March and May 2024 at the Weadock Landfill verified that there were no Appendix IV constituents present at statistically significant levels above the established Groundwater Protection Standard (GWPS) within Weadock Landfill groundwater monitoring system. Results are presented in the enclosed quarterly groundwater monitoring report (Enclosures 1 and 2). Additionally, monitoring performed under the Weadock Groundwater Surface-Water Interface (GSI) Compliance Plan demonstrates protection of human health and the environment with criteria determined to be protective at the point of exposure.

Significant observations from the event summary are as follows:

- No Appendix IV constituents have been observed at statistically significant levels above GWPS for the Weadock Landfill groundwater monitoring system;
- Arsenic was determined to be present at statistically significant levels above the GWPS at one of the three downgradient monitoring wells at the time of the initial semiannual monitoring event (April and May 2018); however, based on the revised groundwater monitoring system (12 perimeter wells, post soil-bentonite slurry wall construction), arsenic is not present at statistically significant levels above the GWPS;
- Arsenic and molybdenum concentrations at monitoring well MW-55 have been reviewed through an Alternate Source Demonstration provided in Appendix G of the *2024 Semiannual Groundwater Monitoring Report and Second Quarter 2024 Hydrogeological Monitoring Report; JC Weadock Solid Waste Disposal Area* (Enclosure 2) indicating elevated levels of constituents at that location are not related to materials management within the Weadock Landfill.
- The nature and extent of contamination (e.g. arsenic) in groundwater relative to GWPSs has been defined per the RCRA CCR Rule requirements based on the site-specific hydrogeology and there are currently no adverse effects on human health or the environment from either surface water or groundwater due to the CCR management at the Weadock Landfill as discussed in the enclosed *First Semiannual 2024 Nature and*

Extent Data Summary, JC Weadock, Consumers Energy, Essexville, Michigan (Enclosure 3).

Conclusions

The first phase of partial closure focused on construction approximately 22.5 acres of final cover commenced in May 2023. The certification for the partial closure was accepted by EGLE on July 17, 2024. Consumers Energy will continue monitoring conditions during the execution of the final closure construction including performance of the soil-bentonite slurry wall. The drinking water and GSI pathways are protected by quarterly monitoring performed under the Michigan-approved hydrogeological monitoring plan that includes a GSI Compliance Monitoring Program.

The final remedy for the Weadock Landfill will be formally selected per §257.97 and Michigan Solid Waste requirements once the selected option is reviewed and commented on by EGLE and a public meeting is conducted at least 30-days prior to the final selection as required under §257.96(e).

The next semiannual progress report will be submitted in six months by January 31, 2024. Please feel free to contact me with any questions or clarifications.

Sincerely,

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Mr. Joe Firlit, Consumers Energy
Ms. Darby Litz, TRC
Ms. Kristin Lowery, TRC
Mr. Jacob Krenz, TRC

Enclosures:

1) First Quarter 2024 Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal Area, Essexville, Michigan. (TRC, April 30, 2024).
2) 2024 Semiannual Groundwater Monitoring Report and Second Quarter 2024 Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal Area, Essexville, Michigan. (TRC, July 30, 2024).
3) First Semiannual 2024 Nature and Extent Data Summary, JC Weadock, Consumers Energy, Essexville, Michigan. (TRC, July 30, 2024).

Enclosure 1
First Quarter 2024 Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal Area, Essexville, Michigan. (TRC, April 30, 2024).

First Quarter 2024 Hydrogeological Monitoring Report

JC Weadock Solid Waste Disposal Area

Essexville, Michigan

April 2024

Prepared For:

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1.0 Introduction

Consumers Energy implemented a comprehensive compliance monitoring plan documented in the *Revised Hydrogeological Monitoring Plan* (Natural Resource Technology, 2010) for the JC Weadock Solid Waste Disposal Area as required by Special License Condition 20.b in Solid Waste Disposal Area Operating License No. 9233 issued on October 15, 2009. Since that time, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule) (USEPA, April 2015 as amended) imposing groundwater monitoring and corrective action requirements that apply to the landfill (Weadock Landfill). Subsequently, Michigan amended Part 115 of the Natural Resources and Environmental Protection Act (NREPA) PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management) to provide a basis for establishing a groundwater monitoring system and initiating detection and assessment monitoring to conform requirements for any licensed coal ash impoundment or landfill after December 28, 2018, with Part 115 amendments and the CCR Rule.

On January 15, 2021, Consumers Energy submitted the *Landfill Hydrogeological Monitoring Plan, JC Weadock Power Plant, Essexville, Michigan* (Weadock Landfill HMP), which includes components for Detection Monitoring and Assessment Monitoring, as well as Groundwater Surface Water Interface (GSI) Compliance Monitoring, to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to comply with the requirements of Part 115 and the CCR Rule. The Weadock Landfill HMP (TRC, February 2021) was revised per EGLE comments, submitted, and approved by EGLE on February 19, 2021, and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9640 issued on March 11, 2021.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This First Quarter 2024 JC Weadock Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring and reporting requirements during the active life of the coal ash landfill. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, dated July 5, 2013 *Format for Solid Waste Disposal Facility Monitoring Submittals*. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the Weadock Landfill HMP that was approved by the EGLE on February 19, 2021. The Weadock Landfill HMP is compliant with Public Act No. 640 of 2018 (PA 640) to amend the NREPA, also known as Part 115 of PA 451 of 1994, as amended (Part 115) (a.k.a., Michigan Part 115 Solid Waste Management).

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the first quarter 2024 at the JC Weadock Solid Waste Disposal Area located at 2742 Weadock Highway

in Essexville, Michigan (Figure 1). This JC Weadock Disposal Area is currently authorized under a permit (Groundwater Discharge Authorization GWE-0005) issued pursuant to Part 31 to discharge to the unusable aquifer directly underlying the solid waste that vents almost immediately to the Saginaw River and Saginaw Bay.

The Weadock Landfill is currently in assessment monitoring pursuant to the CCR Rule. Consumers Energy first reported the potential for statistically significant increases (SSIs) for Appendix III constituents in the *Annual Groundwater Monitoring Report JC Weadock Power Plant Bottom Ash Pond CCR Unit* (TRC, January 2018). The statistical evaluation of the Appendix III indicator parameters confirming SSIs over background were as follows:

- Boron at JCW-MW-15011, JCW-MW-15012, JCW-MW-15023; and
- Field pH at JCW-MW-15023 (high).

On April 25, 2018, Consumers Energy entered assessment monitoring upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. After subsequent sampling for Appendix IV constituents, Consumers Energy provided notice to the Department on January 14, 2019 that arsenic was detected at statistically significant levels above the federal groundwater protection standards (GWPS) established pursuant to §257.95(h) in one monitoring well at the JC Weadock Landfill (JCW-MW-15023), which was located downgradient of a 1,600 linear foot vent within the slurry wall enclosing the historical fly ash disposal area. The vent was designed to direct groundwater flow beneath the landfill to the discharge channel immediately upgradient from the National Pollutant Discharge Elimination System (NPDES) external outfall to prevent water from building up within the facility. In July 2018, this vent was closed (Golder, 2018) and the engineering improvement was approved by the Department (MDEQ, 2018). As a part of the vent closure, monitoring wells JCW-MW-15011, JCW-MW-15012, and JCW-MW-15023 were decommissioned by overdrilling, removing the well material, and sealing the borehole to allow for the slurry wall construction as discussed in the *2018 Annual Groundwater Monitoring Report for the JC Weadock Landfill CCR Unit* (TRC, 2019a). Consumers Energy installed an additional nine monitoring wells in August 2018 to supplement the preexisting Michigan Part 115 compliance groundwater well network and provide appropriate coverage for the collection of groundwater levels and water quality data along the perimeter of the Weadock Landfill, as discussed in the Weadock Landfill HMP. Closing the vent and completely encircling the Weadock Landfill with a soil-bentonite slurry wall has demonstrated reduced groundwater flux around the entire perimeter of the landfill.

In March 2019, Consumers Energy submitted a Response Action Plan (Consumers, 2019), which identified interim response activities taken or to be taken to control possible sources of contamination. Consumers Energy further evaluated arsenic in groundwater at the Weadock Landfill as part of the nature and extent analysis and outlined potential remedies in the Assessment of Corrective Measures (TRC, 2019b), which was initiated on April 14, 2019, and completed on September 11, 2019, and focused on materials management with an emphasis on improving source control through the closure plan.

Compliance monitoring is being implemented under the Weadock Landfill HMP dated February 2021 and approved by the EGLE on February 19, 2021. Groundwater data collected in accordance with the Weadock Landfill HMP are used to:

- Assess background groundwater quality for the purposes of establishing and updating GWPS (HMP Section 7.1 Background Determination)
- Perform detection monitoring to assess whether a new release has occurred during operation of the landfill (*i.e.* statistically significant increase (SSI) over background) (HMP Section 7.2 Detection Monitoring)
- Perform assessment monitoring to assess whether constituent concentrations in groundwater from prior operations are above a risk-based standard (*i.e.* statistically significant level over the GWPS) (HMP Section 7.3 Assessment Monitoring)
- Assess compliance with the GSI pathway (HMP Section 7.4)

Consumers Energy also continues to execute the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98 of the CCR Rule, which includes semiannual assessment monitoring in accordance with §257.95. Assessment monitoring data collected in accordance with the CCR Rule is used to assess whether constituent concentrations in groundwater from prior operations are above a risk-based standard (*i.e.* statistically significant level over the Appendix IV GWPS).

1.3 Site Overview

The JC Weadock Solid Waste Disposal Area is located within the former JC Weadock Power Plant (Site), located south of the DE Karn Power Plant, east of the Saginaw River, west of Underwood Drain and Saginaw Bay, and north of Tacey Drain and agricultural land (Figure 1). In addition to the disposal area, the Site consists of the generating facility which retired eight coal-fired generating units and infrastructure and utilities that support electrical transmission. Units 1 to 6 commenced operation in 1940 and retired in 1980 and Units 7 and 8 were added in 1955 and 1958 continued to operate through April 15, 2016.

1.4 Geology/Hydrogeology

The majority of Weadock Landfill area is comprised of surficial CCR and sand fill, as described in the Weadock Landfill HMP. USGS topographic maps and aerial photographs dating back to 1950, in addition to field descriptions of subsurface soil at the Site, indicate that the Site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

The surficial fill consists of a mixture of varying percentages of ash, sand, and clay-rich fill ranging from 5 to 15 feet thick. Below the surficial fill, native alluvium and lacustrine soils are present at varying depths. Generally, there is a well graded sand unit present to depths of 10-30 feet below ground surface (ft bgs) overlying a clay till which is observed at depth ranging from 25-75 ft bgs. A sandstone unit, which is part of the Saginaw Formation, is generally encountered at 80-90 ft bgs. In general, the alluvium soils (sands) are deeper along the Saginaw River and there are shallower lacustrine deposits (clays, silts, and sands deposited in or on the shores of glacial lakes) at other areas. Along the perimeter of the landfill, there is a

well-graded sand unit present at depths ranging from 10 to 20 ft bgs. The sand is variable in thickness, ranging from <1 to ~6.5 feet, and is discontinuous along the landfill perimeter, as evidenced by the soil boring logs and slurry wall construction documentation.

The alluvium soils pinch out and are not observed in soil borings located south and east of the Weadock Bottom Ash Pond and Weadock Landfill, along the location of the historic shoreline. The non-water-bearing region south of these units extends for at least a mile south and southeast of the Site.

Beneath the surficial fill and sand unit (where present) is 70 to 80 feet of clay till. Along the southern perimeter of the landfill, some of the upper portion of the clay till is sand-rich (generally greater than 20 ft bgs). The clay till acts as a hydraulic barrier that separates the shallow groundwater from the underlying sandstone. The sandstone unit, which is part of the Saginaw Formation, is generally encountered at 80-90 ft bgs.

The Weadock Landfill is bounded by several surface water features (Figures 1 and 2): the Saginaw River to the west, a discharge channel and Saginaw Bay (Lake Huron) to the north, Underwood Drain to the east, and Tacey Drain to the south. Groundwater flow in this water bearing zone is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay.

2.0 Leachate Monitoring

The leachate monitoring program consists of an annual laboratory leachate sampling program (Q1) and an annual field leachate sampling program (Q4) per the Weadock Landfill HMP. This program was instituted to maintain the facility under the applicable portions of Part 115, Rule 311 – Leaching tests to evaluate potential for groundwater contamination at unlined industrial waste landfills. Specifically, Subrule (3) states that waste that is disposed of in an industrial waste landfill shall be retested to evaluate potential for groundwater contamination annually or on a more frequent schedule as specified by the solid waste control agency. In addition to field leachate testing conducted annually to evaluate appropriateness of monitored constituents and changes to fate and transport properties, an annual laboratory leachate analysis program was included to better understand what, if any, changes to waste placement may be occurring at the Weadock Landfill based on the addition of air emissions controls and the commingling of air emissions controls residuals (Spray Dry Absorber – SDA) over time. The Weadock Landfill HMP includes the laboratory leachate testing program, consisting of four dry-handled Coal Combustion Residual (CCR) samples commingled with SDA materials collected from each of the disposal silos dedicated to DE Karn Electrical Generating Units 1 and 2. Karn Units 1 & 2 permanently ceased operation on May 31, 2023, so additional CCR and air emissions residuals are not being generated; therefore, there are no results to report for this waste steam. It is noteworthy that the Weadock Landfill continues to receive materials facilitating the closure of the landfill in the form of uncontaminated soil from documented sources, and limited contaminated soil that has been authorized for placement in the Weadock Landfill under the Beneficial Use 3 designation as other materials designated for construction at a licensed solid waste disposal facility. These results are maintained with the closure certification documentation.

Additional support for evaluating the potential for groundwater contamination at the unlined industrial waste landfill includes the field leachate monitoring program conducted during the fourth quarter of each year. This program consists of an annual sampling collection from two (2) leachate headwells; LH-103R and LH-104. This program was implemented to determine constituents in the leachate as measured under actual conditions in the field and to assess which constituents have the potential to exceed applicable criteria at the compliance well locations.

Field leachate data was collected from LH-103R and LH-104 in the fourth quarter of 2023. The October 2023 low-level mercury concentrations for LH-103R and LH-103R DUP were noted in the Q4 2023 data quality review as potentially biased high due to a high matrix spike recovery reported in the laboratory report; however, low-level mercury concentrations are generally consistent with prior sample results and field leachate concentrations are below the GSI criterion of 1.3 nanograms per liter. Given the potential uncertainly in the low-level mercury sample results from the fourth quarter of 2023, the field leachate headwells were resampled in first quarter 2024. As shown in Table 7, the March 2024 samples collected from LH-103R and LH-104 demonstrate that low-level mercury concentrations are below the GSI criterion. No new constituents have been identified for inclusion in the porewater and GSI monitoring programs.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

The groundwater monitoring system presented in the Weadock Landfill HMP has been established in accordance with R 299.4906 and the CCR Rule §257.91 and consists of 27 monitoring wells (four background monitoring wells, 12 downgradient monitoring wells, and 11 additional wells used for static water level measurements only) that are screened in the uppermost aquifer. The monitoring well network has been designed to provide appropriate coverage for water level and water quality data collection along the perimeter of the landfill. The monitoring well locations are shown on Figure 2. Monitoring well specifications and purpose (i.e. static water level monitoring, groundwater quality monitoring, or GSI monitoring) are included in Table 1.

The Weadock Landfill HMP groundwater monitoring system consists of the following:

- ***Background Groundwater Quality:*** Four monitoring wells located southwest of the Weadock Landfill provide data on background groundwater quality that has not been affected by the CCR unit (MW-15002, MW-15008, MW-15016, and MW-15019) and are used to establish groundwater protection standards (GWPSs) for the landfill:
  - MW-15002 – MW-15008 – MW-15016 – MW-15019
- ***Downgradient Groundwater Quality:*** The twelve downgradient monitoring wells, located on the outside of the perimeter slurry wall include:
  - JCW-MW-18001 – JCW-MW-18004 – JCW-MW-18005 – JCW-MW-18006
  - MW-50 – MW-51 – MW-52 – MW-53
  - MW-53R – MW-54R – MW-55 – OW-57R Out
- ***Groundwater-Surface Water Interface (GSI) Monitoring***: Monitoring wells located along the surface water features adjacent to the Weadock Landfill are included in the monitoring program to meet the requirements of Part 31. Locations and alignments were established in the Phase II Groundwater Discharge Evaluation, Figure: Appendix K (Natural Resource Technology, 2005) as a baseline for monitoring future results. These monitoring wells are screened across the water table of the uppermost aquifer and serve as GSI monitoring wells to determine compliance with generic GSI criteria or site-specific mixing zone-based criteria as appropriate. The eight GSI compliance monitoring wells include:
  - MW-50 – MW-51 – MW-52 – MW-53
  - MW-53R – MW-54R – MW-55 – JCW-MW-18004
- ***Static Water Level Measurement Only:*** Eleven additional monitoring wells, located on the inside of the perimeter slurry wall, at paired locations with several of the downgradient monitoring wells include:
  - JCW-OW-18001 – JCW-OW-18002 – JCW-MW-18003 – JCW-MW-18004
  - JCW-MW-18005 – JCW-MW-18006 – MW-20 – OW-51
  - OW-53 – OW-54 – OW-55 – OW-56R
  - OW-57R IN – OW-61 – OW-63

3.2 March 2024 Monitoring Event

In accordance with the Weadock Landfill HMP, TRC conducted the first quarter 2024 monitoring event for the Weadock Landfill by collecting water levels and groundwater samples on March 4 through 6, 2024. Samples that were collected during this event were submitted to Consumers Energy Laboratory Services in Jackson, Michigan for analysis of total metals and inorganic parameters. Quarterly monitoring constituents include:

Section 11511a(3)(c) – Detection Monitoring Constituents	Section 11519b(2) – Assessment Monitoring Constituents	
Boron	Antimony	Lithium
Calcium	Arsenic	Mercury
Chloride	Barium	Molybdenum
Fluoride	Beryllium	Nickel
Iron	Cadmium	Selenium
pH	Chromium, total	Silver
Sulfate	Cobalt	Thallium
Total Dissolved Solids (TDS)	Copper	Vanadium
	Fluoride	Zinc
	Lead	

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, and bicarbonate, carbonate, and total alkalinity. Analytical results from the monitoring event are included in the attached laboratory reports (Appendix E).

Static water level measurements were collected at all locations after equilibration to atmospheric pressure and immediately prior to purging. The depth to water was recorded to the nearest 0.01-ft in accordance with the procedures in the Weadock Landfill HMP. Groundwater purging and sampling were conducted in accordance with low-flow sampling protocol. Static water elevation data are included in the attached field records (Appendix F).

Groundwater samples were collected using a peristaltic pump. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Groundwater sample preparation and analyses were performed in accordance with SW-846 “Test Methods for Evaluation Solid Waste – Chemical / Physical Methods,” USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of two field blanks, one equipment blank, three field duplicates (MW-15008, JCW-MW-18006, and MW-50), and one field matrix spike/matrix spike duplicate sample pair (JCW-MW-18001). Additionally, one field blank, one equipment

blank, two field duplicates (LH-103R and LH-104), and one field matrix/spike duplicate pair (LH-103R) and a trip blank were collected as part of the QA/QC samples for the low-level mercury resampling at the leachate headwells.

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The laboratory data were found to be complete and usable for the purposes of the Weadock Landfill HMP. The data quality reviews for the JC Weadock Disposal Area network wells are summarized in Appendix B.

3.3 Groundwater Flow Rate and Direction

Potentiometric monitoring in the unusable aquifer beneath the facility includes static water level data collected for development of water table contours and evaluation of the potential for discharge from the facility. The monitoring under this section will be conducted quarterly until closure, as approved by the Director, and semiannually during the 30-year postclosure period. Monitoring will continue until the end of post closure (30 years) or as otherwise approved by the Director.

The measurements for top of casing (TOC) and recorded depth to water (DTW) with corresponding calculated static water level (SWL) is tabulated and presented in Table 1. A potentiometric surface map is provided as Figure 3.

Groundwater elevations measured at the Site in March 2024 are generally within the range of 578 to 596 feet above mean sea level (ft NAVD88). Groundwater elevations in monitoring wells located adjacent to Saginaw Bay and adjoining surface water bodies are typically encountered at a similar or slightly higher elevation relative to surrounding surface water features measured by the NOAA gauging station. A time-series plot included in Appendix A compares the groundwater elevation of at the GSI monitoring wells (MW-50, MW-51, MW-52, MW-53, MW-54R, JCW-MW-18004, and MW-55) to the nearby NOAA staff gauge. Water levels in wells adjacent to surface water bodies (e.g. Saginaw Bay, Tacey Drain) closely mirror the surface water elevation. Such conditions would result in a minimal gradient to potentially a reverse gradient (i.e., toward the landfill) between the well and the drain which would result in minimal to zero mass flux to the drain (Appendix A: Table A1).

The groundwater monitoring system is structured such that there are eleven monitoring well pairs used to evaluate the hydraulic gradient and potential for water flux across the slurry wall. Static water level observations from the paired wells are shown on time series charts in Appendix A. The static water level elevations inside of the Weadock Landfill perimeter slurry wall are generally significantly different (>3 ft) than static water levels outside of the slurry wall, which demonstrates the presence of a low permeability feature between the well pairings inside and outside of the constructed slurry wall. As such, the water level elevations indicate that the slurry wall is performing as designed. The general flow direction observed within the confinement of the slurry wall is similar to that identified in previous monitoring rounds. Due to the potential for radial flow, the downgradient wells are appropriately positioned to detect the

presence of detection or assessment parameters that could potentially migrate from the Weadock Landfill. As shown on Figure 3 and in Appendix A, the static water level outside of the slurry wall is lower than the static water level inside of the wall; therefore, the potential groundwater flux across the slurry wall was calculated and included in Table A2 of Appendix A.

3.4 Groundwater Analytical Data and Relevant Screening Criteria

Groundwater analytical data are evaluated in accordance with the Weadock Landfill HMP to determine the effectiveness of landfill structural and operational enhancement measures on the quality and quantity of groundwater flow beneath the footprint of the facility (Section 3.4.1 Detection Monitoring and Section 3.4.2 Assessment Monitoring). Additionally, analytical results are evaluated in support of GSI compliance. GSI criteria only apply to the designated compliance point as specified in Section 3.4.3 below; however, analytical results and data trends in groundwater collected from the perimeter dike wells are evaluated to identify potential GSI compliance issues. Data are evaluated by using a combination of screening against relevant criteria, as well as utilizing statistical analyses.

Analytical results from the first quarter 2024 monitoring event are included in the attached laboratory report (Appendix E). Groundwater analytical data from the first quarter 2024 monitoring event are summarized in Table 3 (background monitoring wells) and Table 4 (Weadock Landfill Monitoring Wells), as well as the associated Part 201 generic GSI and site-specific mixing-zone GSI criteria. Field data are summarized in Table 2.

Mixing-zone criteria for arsenic, boron, and selenium are provided for the Karn-Weadock complex in the mixing zone determination, dated December 23, 2015 (MDEQ, 2015). As such, arsenic, boron, and selenium are compared to site-specific mixing zone-based GSI criteria, and all other constituents are screened against generic GSI criteria. All data are screened against GSI criteria; however, compliance with GSI criteria is determined at select monitoring locations as noted in Section 3.4.3 below.

The mixing zone determination included both final acute values (FAV) and final chronic values (FCV). If a concentration of a constituent at a groundwater well exceeds the acute criteria, and the exceedances are upgradient of the GSI compliance monitoring wells, Consumers Energy must demonstrate that data from all of the compliance monitoring wells are, and will be, in compliance with acute mixing zone-based GSI criteria for those parameters. Averaging of groundwater data is not allowed for comparison to generic GSI or acute mixing zone-based GSI criteria. Acute mixing zoned-based or generic GSI criteria may not be exceeded in any individual GSI compliance monitoring well. If a concentration of a constituent at a well exceeds the chronic criterion, compliance can be demonstrated on a mass-flux basis. The facility can choose to demonstrate compliance by evaluating the total chronic loading based upon the contribution from each compliance well with respect to the total flux observed in the mixing zone.

Table 6 provides a summary of the statistically significant increases or exceedances over the most recent four quarters in accordance with the EGLE-prescribed format; only well/constituent pairs that exceed the relevant Part 115 compliance standard – the GSI pathway standard (Section 3.4.3) within the last four quarters are included.

3.4.1 Detection Monitoring

Detection monitoring is continuing through the active life of the Weadock Landfill to monitor for new releases from landfill operations. The detection monitoring program consists of potentiometric analysis and groundwater quality analysis. The potentiometric analysis, as discussed in Section 3.3, demonstrates that the slurry wall is performing as designed.

In addition to the comparison of analytical data to relevant screening criteria (Table 4), statistical trend analyses are used to evaluate groundwater quality each quarter. Consumers Energy manages and evaluates its groundwater data using Sanitas™ Statistical Software. Consumers Energy conducts intrawell trend analyses to examine data for a given well over time to determine if changes in water quality are occurring that may be associated with the landfill and to identify potential GSI compliance issues. Specifically, the Mann-Kendall test for trend was performed at a significance level (α) of 0.025 per tail for each constituent/sampling point dataset to assess trends. Sen's Slope estimator was used to assess the magnitude of the slope and the Mann-Kendall test was used to determine if the trend was statistically significant.

Appendix C includes a table summarizing the results of the trend tests as well as the Sanitas™ output summary statistics and graphs. Data are stable or declining for the majority of the well/constituent pairs, with the following exceptions:

- A new, unconfirmed increasing trend for boron was observed at MW-50 in Q1 2024.
- The increasing trend for boron at MW-54R continued in Q1 2024.
- The previously observed increasing trend of boron at MW-55 did not continue in Q1 2024.
- The increasing trend for calcium at JCW-MW-18001 continued in Q1 2024.
- A new, unconfirmed increasing trend for chloride was observed at JCW-MW-18004 in Q1 2024.
- The increasing trend for iron at JCW-MW-18001 continued in Q1 2024.
- The increasing trend for sulfate at JCW-MW-18001 continued in Q1 2024.
- New, unconfirmed increasing trends for sulfate were observed at JCW-MW-18006 and MW-50 in Q1 2024.
- A new, unconfirmed increasing trend for total dissolved solids was observed at OW-57R OUT in Q1 2024.

Although increasing trends for detection monitoring constituents were observed, individual constituent trends provide a *potential indication* that there may be a release coming from the monitored unit. When these indicator trends are evaluated with other co-monitored conditions and parameters at the Weadock Landfill, the increasing trends for detection monitoring constituents do not appear to be a result of a new release from operation of the landfill. The potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill. Several of these newly observed trends, such as those observed for calcium, iron, and sulfate are likely a result of localized geochemical changes influenced by changes in lake levels rather than a change in flux from the landfill and will continue to be evaluated. The increasing trends of calcium and sulfate in JCW-MW-18001 are attributed to localized changes in geochemistry proximal to each well, rather than a change in flux from the

landfill, as discussed further in Section 3.5. Additionally, iron concentrations in all monitoring wells remain below the relevant Part 115 compliance standard – the GSI pathway standard.

Consumers is further evaluating possible causes of the increasing boron concentrations at several porewater compliance monitoring wells. Previous studies (NRT, 2005) documented boron at significantly elevated concentrations at the Karn-Weadock Power Generating Complex. Boron was also identified as an SSI over background levels in the 2017 *Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit* (TRC, 2018) and was one of the detection monitoring constituents that triggered the initiation of the assessment monitoring program. Statistical significance above the GWPS established for boron has been noted for these monitoring wells per the Part 115 groundwater monitoring program requirements, as discussed in Section 3.4.2.2. Continued monitoring and assessment for potential future actions is warranted at this time; however, observed concentrations of boron in each of the monitoring wells are less than the relevant Part 115 compliance standard – the GSI pathway standard (Section 3.4.3).

3.4.2 Assessment Monitoring Data Evaluation

Assessment monitoring is continuing at the Weadock Landfill in accordance with the Weadock Landfill HMP and §257.95. The assessment monitoring data were statistically evaluated in accordance with the procedures in the Weadock Landfill HMP. The statistical evaluation details are provided in Appendix D. A summary of the confidence interval evaluation is provided in Table 5.

3.4.2.1 Establishing Groundwater Protection Standards

The GWPSs are used to assess constituent concentrations present in groundwater as a result of CCR unit operations by statistically comparing concentrations in the downgradient wells to each of the respective GWPSs for each detection and assessment monitoring constituent. The calculation of the GWPSs in accordance with the Weadock Landfill HMP is documented in the *Groundwater Protection Standards* technical memorandum included as Appendix H of the *First Quarter 2021 Hydrogeological Monitoring Report* (TRC, 2021b). The Federal CCR Rule requires establishment of GWPSs for assessment monitoring (Appendix IV) constituents only. Part 115 requires establishment of GWPSs for both detection and assessment monitoring constituents.

3.4.2.2 Data Comparison to Groundwater Protection Standards

Consistent with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009) and the Weadock Landfill HMP, the preferred method for comparisons to a fixed standard are confidence limits. An exceedance of the standard occurs when the 99 percent lower confidence level of the downgradient data exceeds the GWPS.

Detection Monitoring Constituents (Part 115): The first quarter 2024 statistical evaluation indicates that boron at JCW-MW-18001, JCW-MW-18005, JCW-MW-18006, MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, MW-55, and OW-57R OUT, calcium at JCW-MW-18001, and sulfate at JCW-MW-18001 were present at statistically significant levels above the GWPS.

Boron was one of the Appendix III SSIs that originally triggered assessment monitoring. Boron concentrations have been consistently above the GWPS but less than the chronic-based mixing zone-based GSI criterion of 44,000 ug/L within the Weadock Landfill monitoring well network since monitoring under the Weadock Landfill HMP began in first quarter 2021.

Calcium at JCW-MW-18001 was present at statistically significant levels above the GWPS beginning in first quarter 2023 resulting from increases in calcium concentration since first quarter 2021. Sulfate was present at JCW-MW-18001 at statistically significant levels above the GWPS for the first time in second quarter 2023 due to increasing concentrations. Consumers is asserting an ASD for the increases in calcium and sulfate at JCW-MW-18001, as detailed in Section 3.5.

The GWPSs for boron, calcium, and sulfate were established based on background concentrations observed in wells unaffected by the Weadock Landfill or Weadock Bottom Ash Pond. Detection monitoring (i.e., Appendix III) constituents do not have associated health-based criteria and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. Overall, data continue to demonstrate compliance with the applicable GSI criteria, as discussed in Section 3.4.3.

Assessment Monitoring Constituents (Part 115 and Federal CCR): Based on the first quarter 2024 statistical evaluation, there are no assessment monitoring constituents present at statistically significant levels above the GWPSs within the Weadock Landfill groundwater monitoring system. Although concentrations of arsenic and molybdenum at MW-55 observed during individual sampling events are above the GWPS, the elevated concentrations of those constituents are not a result of a release from the Weadock Landfill, as detailed in Section 3.5. The head differential of 9.53 feet between OW-55 inside the slurry wall and MW-55 outside of the slurry wall also suggests that the integrity of the slurry wall is maintained and groundwater flow from the landfill to the south is impeded by the low permeability of the slurry wall. Groundwater conditions at MW-55 will continue to be monitored.

3.4.3 GSI Compliance Monitoring

The GSI monitoring program consists of the eight monitoring points located along the surface water features:

- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- JCW-MW-18004

First quarter 2024 data from the GSI monitoring points are tabulated in Table 4. Consistent with the Weadock Landfill HMP, confidence limits were established for the following GSI monitoring program constituents:

- Boron
- Iron
- pH
- Sulfate
- Arsenic
- Chromium
- Lithium
- Molybdenum

- Selenium
- Vanadium

The confidence interval calculations are provided in Appendix D. The confidence interval test compares the lower confidence limit to the GSI. Overall, data continue to demonstrate compliance with the applicable GSI criteria.

Boron: The assessment monitoring statistical evaluation found that boron was present at statistically significant levels above the GWPS at JCW-MW-18001, JCW-MW-18005, JCW-MW-18006, MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, MW-55, and OW-57R OUT. Boron is a detection monitoring (i.e. Appendix III) constituent and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. All observations of boron are less than the recommended mixing-zone based GSI value specified in Table 3 of the *Implementation of a Mixing Zone Request, Consumers Energy DE Karn/JC Weadock Complex* (MDEQ, 2015) (Appendix D: Table 2).

Arsenic and Molybdenum at MW-55: Concentrations of arsenic and molybdenum at MW-55 have at times exceeded the GSI criteria on a direct comparison to the fixed limit basis (Appendix D: Table 2).[1] The first quarter 2024 sampling event results show that both arsenic and molybdenum concentrations are below applicable GSI criteria. The statistical evaluation presented in Appendix D shows that the lower confidence limit of the arsenic data over the past 8 events does not exceed the GSI criterion. Molybdenum concentrations have not directly exceeded the GSI criterion within the past 8 events; therefore, confidence limits were not calculated. Additionally, water levels in MW-55 closely mirror the surface water elevation measured at the NOAA gauging station, which indicates there is a minimal outward gradient to a potentially, modest reverse gradient (i.e., toward the landfill) between the monitoring well and the drain, resulting in a minimal to zero mass flux to the drain (Appendix A).

3.5 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed below:

- Calcium and sulfate in monitoring well JCW-MW-18001; and
- Arsenic and molybdenum in monitoring well MW-55.

The groundwater conditions do not conclusively indicate a release from the unit for several reasons as detailed below.

3.5.1 Monitoring Well JCW-MW-18001: Calcium and Sulfate

Although confirmed increasing trends were observed at JCW-MW-18001 for calcium and sulfate (through Q1 2024), these trends are not indicative of a new release from the landfill. Calcium and sulfate are two of several constituents that contribute to the overall TDS concentration and increasing calcium and sulfate concentrations could result in an increase in TDS as well. Although, TDS concentrations are not currently exhibiting a statistically significant upward trend, TDS concentrations have been increasing in past events and the data are discussed as part of

[1] Molybdenum was last observed at a concentration above the GSI criterion in fourth quarter 2021.

this ASD. Increases of calcium, sulfate, and TDS concentrations at JCW-MW-18001 are attributed to changes occurring outside of the slurry wall as a result of changing water levels, rather than a change in flux from the landfill; therefore, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD) for these constituents. The following lines of evidence as well as additional time series charts included in Appendix G support this ASD:

- The potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill (Appendix A).
- Concentration data also support that the slurry wall is effective in reducing the flux of groundwater from the landfill, based on the following observations (Appendix G1):
  - JCW-MW-18001 was installed after the 1,600 linear foot gap in the landfill perimeter slurry wall was closed, as discussed in Section 1.2. Prior to the slurry wall expansion in July 2018, monitoring well JCW-MW-15023 was located within the gap of the slurry wall and was sampled between December 2015 and May 2018 as a part of the original Federal CCR program monitoring well network. The groundwater quality data collected from JCW-MW-15023 shows that groundwater in contact with CCR managed within the landfill was high in arsenic, and low in sulfate, calcium, and TDS (Appendix G1).
  - To accommodate the July 2018 slurry wall expansion, JCW-MW-15023 was decommissioned. Once slurry wall construction was completed, JCW-MW-18001 was installed within 10-ft of the location of the former JCW-MW-15023 well, on the discharge channel side of the slurry wall. Additionally, an observation well, JCW-OW-18001, was installed on the landfill side of the slurry wall to monitor water levels to assess the effectiveness of the hydraulic control. Both JCW-MW-18001 (outside) and JCW-OW-18001 (inside) have been sampled recently to assess concentration trends.
    - Concentrations of arsenic are much higher inside of the slurry wall, within the landfill, while arsenic concentration remain low on the outside of the landfill.
    - Concentrations of calcium, sulfate, and TDS are much lower on the inside of the slurry wall and are higher outside of the slurry wall.
- These combined lines of evidence support that increasing concentrations of calcium, sulfate, and TDS are not a result of a change in flux from the landfill and instead are a result of changing groundwater conditions on the outside of the slurry wall.

3.5.2 Monitoring Well MW-55: Arsenic and Molybdenum

Additionally, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD) for arsenic and molybdenum at MW-55 indicating elevated levels of constituents at that location are not related to materials management of the Weadock Landfill (*2021 Annual Groundwater Monitoring and Corrective Action Report*; TRC, January 2022). The basis for this ASD is summarized below and updated time series plots in support of this ASD are included in Appendix G (Figure G2).

Data collected from the 2018 investigation as well as data collected during routine sampling events for Part 115 and Federal CCR groundwater compliance show the following:

- **Distinct Chemistry from Leachate –** The leachate chemistry from a monitoring well screened at the base of the ash fill (LH-104) is distinctly different from the groundwater

chemistry near MW-55 and the temporary monitoring wells installed by TRC in the investigation area, as illustrated Appendix G of the 2019 Annual Groundwater Monitoring and Corrective Action Report (TRC, January 2020). Additionally, concentrations of arsenic are generally much lower, and concentrations of boron are much higher within the landfill (LH-104) than outside of the landfill at MW-55 (Figure G2).

- **Conservative Tracer –** Boron is a metalloid known to be present in coal ash and can be used as a conservative tracer in groundwater. The average concentration of boron in Leachate Headwell LH-104 (10,800 ug/L: November 2017 - October 2023) is significantly higher than concentrations observed at any of the other locations sampled as a part of this monitoring program. Additionally, recently observed boron concentrations at MW-55 are similar to or lower than historical concentrations, which further supports that the water quality at MW-55 is not directly affected by groundwater migrating from the landfill.
- **Reducing Conditions and Groundwater Head Levels –** Water levels observed at MW-55, as shown in Appendices A and G, increased over 4-ft between 2010 and 2020. The oxidation-reduction potential (ORP) at MW-55 has generally decreased (i.e., is more reducing) since 2010. The lowering of ORP over time as a result of increased water levels has changed the geochemical conditions in the vicinity of MW-55 and has resulted in increased solubility of arsenic and molybdenum. Since 2021, water levels have been generally decreasing, resulting in a slight increase in ORP (i.e., is less reducing) and decreases in concentrations of both arsenic and molybdenum, which further illustrates the relationship between groundwater elevations, redox state, and concentration of arsenic and molybdenum in groundwater.

4.0 Conclusions and Recommendations

Detection monitoring is continuing through the active life of the Weadock Landfill to monitor for new releases from landfill operations. The detection monitoring program consists of potentiometric analysis and groundwater quality analysis. Evaluation of the first quarter 2024 data demonstrate that the slurry wall is functioning as designed.

The Weadock Landfill is currently in assessment monitoring pursuant to the CCR Rule, as discussed in the *2023 Annual Groundwater Monitoring and Corrective Action Report*, due to observed groundwater concentrations that are indicative of impact from past landfill operations. Evaluation of the first quarter 2024 data in accordance with the Weadock Landfill HMP demonstrate that boron, calcium, and sulfate are present at concentrations above the GWPSs. Boron, calcium, and sulfate are detection monitoring (i.e., Appendix III) constituents that do not have associated health-based criteria and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. The statistical evaluation in first quarter 2024 found that no constituents were present at statistically significant levels above applicable GSI criteria.

Therefore, Consumers Energy will continue with the detection and assessment monitoring as required by the CCR rule as well as the monitoring program relative to the implementation of the site-specific mixing zone authorization at the Weadock Landfill unit in conformance with the JC Weadock Landfill HMP. The second quarter monitoring event for is scheduled for May 2024.

5.0 References

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Tables

Table 1
Summary of Groundwater Elevation Data
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)			March 4, 2024	
						Depth to Water (ft BTOC)	Groundwater Elevation (ft)
Background Monitoring Wells							
MW-15002	587.71	Sand	580.9	to	570.9	6.73	580.98
MW-15008	585.36	Sand with clay	578.7	to	568.7	4.32	581.04
MW-15016	586.49	Sand	581.2	to	578.2	5.53	580.96
MW-15019	586.17	Sand and Sand/Clay	579.5	to	569.5	5.46	580.71
Bottom Ash Pond: Downgradient Monitoring Wells							
JCW-MW-15007	587.40	Sand	582.7	to	579.2	3.02	584.38
JCW-MW-15009	589.64	Sand	581.9	to	576.9	9.40	580.24
JCW-MW-15010	597.76	Sand	579.7	to	578.2	18.03	579.73
JCW-MW-15028	589.64	Sand	567.7	to	564.7	7.80	581.84
Landfill: Downgradient Monitoring Wells (outside slurry wall)							
JCW-MW-18001	596.73	Sand and Sandy Clay	578.3	to	573.3	17.95	578.78
JCW-MW-18004	593.04	Sandy Clay	583.9	to	578.9	12.98	580.06
JCW-MW-18005	590.89	Sand and Sandy Clay	580.0	to	575.0	8.15	582.74
JCW-MW-18006	600.72	Fly Ash and Sandy Clay	582.8	to	577.8	12.73	587.99
MW-50	593.36	Sand	577.8	to	574.8	14.53	578.83
MW-51	594.29	Sand and Clay	577.8	to	574.8	15.24	579.05
MW-52	594.90	Sand	579.3	to	576.3	16.60	578.30
MW-53	593.68	Sand and Clay	579.1	to	576.1	14.58	579.10
MW-53R	594.25	Sand and Clay	580.4	to	575.4	15.38	578.87
MW-54R	593.89	Clay and Sand	581.3	to	576.3	14.75	579.14
MW-55	593.82	Sand	581.5	to	578.5	14.84	578.98
OW-57R OUT	591.00	Sandy Clay	577.0	to	572.0	9.60	581.40
Landfill: Static Water Level Only (inside slurry wall)							
JCW-OW-18001	595.84	Fly Ash and Sand	581.1	to	576.1	6.60	589.24
JCW-OW-18002	593.63	Sand	578.9	to	573.9	10.78	582.85
JCW-OW-18003	593.99	Sand and Clay	580.5	to	575.5	8.28	585.71
JCW-OW-18004	594.19	Sandy Clay	584.6	to	579.6	6.36	587.83
JCW-OW-18006	600.61	Fly Ash and Clay with Sand	582.9	to	577.9	7.02	593.59
MW-20	592.73	NR	~581.1	to	~578.1	6.16	586.57
OW-51	593.62	Clay and Sand	578.9	to	575.9	9.15	584.47
OW-53	593.64	Clay and Sand	579.0	to	576.0	7.48	586.16
OW-54	594.10	Clay and Sand	580.0	to	577.0	6.52	587.58
OW-55	594.67	Clay (or Sand and Clay)	580.9	to	577.9	6.16	588.51
OW-56R	592.01	Ash and Sand	577.5	to	572.5	5.68	586.33
OW-57R IN	590.86	Sandy Clay	575.7	to	570.7	5.80	585.06
OW-61	602.15	Ash and Sand	588.0	to	585.0	6.20	595.95
Landfill: Leachate Headwells							
LH-103R	612.70	Fly Ash	30.2	to	33.2	21.28	591.42
LH-104	596.56	Fly Ash	8.0	to	11.0	8.05	588.51

Notes:

Survey data from: Rowe Professional Services Company (Nov. 2015) and Consumers Energy Company drawings: SG-21733, Sheet 1, Rev. G (Karn, 11/27/18); and SG-21733, Sheet 2, Rev. C (Weadock, 11/27/18).

Elevation in feet relative to North American Vertical Datum 1988 (NAVD 88).

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

NR: Not Recorded

Table 2
Summary of Field Parameters
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Background							
MW-15002	3/5/2024	1.76(1)	-69.2	6.7	4,728	8.3	0.0
MW-15008	3/5/2024	1.51(1)	-115.1	6.7	1,506	8.5	0.0
MW-15016	3/5/2024	1.53(1)	-102.4	7.0	1,318	5.8	0.0
MW-15019	3/5/2024	1.63(1)	-87.9	6.7	1,765	7.3	0.0
Weadock Landfill							
JCW-MW-18001	3/5/2024	0.95	-36.7	6.8	3,433	9.7	6.5
JCW-MW-18004	3/5/2024	9.00	78.5	7.0	1,455	6.5	6.2
JCW-MW-18005	3/6/2024	0.85	-8.5	6.7	1,605	6.1	9.5
JCW-MW-18006	3/6/2024	0.87	-66.3	7.0	1,157	7.6	9.3
MW-50	3/5/2024	1.00	-45.5	7.5	1,447	8.6	6.0
MW-51	3/5/2024	1.45	-16.0	7.4	1,256	8.2	6.4
MW-52	3/5/2024	1.00	-15.0	7.0	1,635	7.8	10.0
MW-53	3/5/2024	0.85	-32.5	7.5	1,104	7.8	10.0
MW-53R	3/5/2024	0.91	8.5	7.0	1,245	7.7	6.9
MW-54R	3/5/2024	1.90	49.5	7.0	1,131	6.9	8.9
MW-55	3/5/2024	1.00	-57.2	6.9	1,210	7.6	9.9
OW-57ROUT	3/6/2024	4.30	43.0	7.2	1,167	6.5	5.7

Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard Units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celsius.

NTU - Nephelometric Turbidity Unit.

(1) The water quality meter used at this well location was determined to have a bias towards elevated dissolved oxygen readings.

Table 3
Summary of Groundwater Sampling Results (Analytical)
DE Karn & JC Weadock Background – RCRA CCR Monitoring Program
Essexville, Michigan

					Sample Location:	**MW-15002**	**MW-15008**	**MW-15016**	**MW-15019**
					Sample Date:	3/5/2024	3/5/2024	3/5/2024	3/5/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Background			
Appendix III[(1)]									
Boron	ug/L	NC	500	500	4,000	116	128	336	241
Calcium	mg/L	NC	NC	NC	500[EE]	175	124	227	174
Chloride	mg/L	**250****	**250[E]**	**250[E]**	**50**	**1,860**	**400**	**117**	**383**
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	500[EE]	3.79	5.64	**271**	92.7
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	**3,300**	**1,010**	**1,090**	**1,220**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5[E]	6.5 - 8.5[E]	6.5 - 9.0	6.7	6.7	7.0	6.7
Appendix IV[(1)]									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	< 1	3	**12**	2
Barium	ug/L	2,000	2,000	2,000	1,200	474	92	131	361
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	13	20	72	14
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	--	--	--	--
Radium-228	pCi/L	NC	NC	NC	NC	--	--	--	--
Radium-226/228	pCi/L	5	NC	NC	NC	--	--	--	--
Selenium	ug/L	50	50	50	5.0	< 1	< 1	< 1	< 1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]									
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	**17,600**	**18,900**	**18,200**	**23,000**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	2	< 1	2	1
Nickel	ug/L	NC	100	100	120	6	4	7	4
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	**4.5**	62	27	**16**	**7**	< 2	2
Zinc	ug/L	5,000**	2,400	5,000[E]	260	12	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

** - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. Chromium GSI criterion based on hexavalent chromium per footnote {H}. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}. GSI criterion for chloride is 50 mg/L when the discharge is to the Great Lakes or connecting waters per footnote {FF}

- If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

[E] - Criterion is the aesthetic drinking water value per footnote {E}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

BOLD value indicates an exceedance of one or more of the listed criteria.

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Groundwater Sampling Results (Analytical)
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

							Sample Location:	**JCW-MW-18001**	**JCW-MW-18004**	**JCW-MW-18005**	**JCW-MW-18006**	**MW-50**	**MW-51**
							Sample Date:	3/5/2024	3/5/2024	3/6/2024	3/6/2024	3/5/2024	3/5/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Chronic-Based Mixing Zone GSI Criteria^	Acute-Based Mixing Zone GSI Criteria^	Downgradient	Downgradient/ GSI	Downgradient	Downgradient	Downgradient/ GSI	Downgradient/ GSI
Appendix III(1)													
Boron	ug/L	NC	**500**	**500**	**4,000**	44,000	69,000	**1,420**	192	**1,000**	**2,650**	**2,170**	**935**
Calcium	mg/L	NC	NC	NC	**500**EE	NC	NC	**557**	238	335	137	199	132
Chloride	mg/L	250**	250E	250E	**50**	NC	NC	45	17	23	**61**	40	**78**
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250**E	**250**E	**500**EE	NC	NC	**1,880**	**557**	**512**	70	**449**	**266**
Total Dissolved Solids	mg/L	**500****	**500**E	**500**E	**500**	NC	NC	**3,450**	**1,250**	**1,400**	**748**	**1,180**	**902**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5E	6.5 - 8.5E	6.5 - 9.0	NC	NC	6.8	7.0	6.7	7.0	7.5	7.4
Appendix IV(1)													
Antimony	ug/L	6	6.0	6.0	2.0	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	100	680	< 1	< 1	3	**22**	3	10
Barium	ug/L	2,000	2,000	2,000	1,200	NC	NC	49	26	136	445	187	127
Beryllium	ug/L	4	4.0	4.0	33	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	NC	NC	1	1	< 1	< 1	1	1
Cobalt	ug/L	NC	40	100	100	NC	NC	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	NC	NC	106	43	43	52	69	31
Mercury	ug/L	2	2.0	2.0	0.20#	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	NC	NC	< 5	< 5	< 5	< 5	6	< 5
Radium-226	pCi/L	NC	NC	NC	NC	NC	NC	--	--	--	--	--	--
Radium-228	pCi/L	NC	NC	NC	NC	NC	NC	--	--	--	--	--	--
Radium-226/228	pCi/L	5	NC	NC	NC	NC	NC	--	--	--	--	--	--
Selenium	ug/L	50	50	50	5.0	55	120	2	4	2	3	3	1
Thallium	ug/L	2	2.0	2.0	2.0	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115(2)													
Iron	ug/L	**300****	**300**E	**300**E	500,000EE	NC	NC	**3,570**	98	**4,020**	**7,970**	**889**	**446**
Copper	ug/L	1,000**	1,000E	1,000E	20	NC	NC	3	2	7	2	1	1
Nickel	ug/L	NC	100	100	120	NC	NC	14	< 2	< 2	5	8	< 2
Silver	ug/L	100**	34	98	0.2	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	NC	NC	3	< 2	< 2	4	< 2	2
Zinc	ug/L	5,000**	2,400	5,000E	260	NC	NC	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

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** - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. Chromium GSI criterion based on hexavalent chromium per footnote {H}. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}. GSI criterion for chloride is 50 mg/L when the discharge is to the Great Lakes or connecting waters per footnote {FF}

- If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

E - Criterion is the aesthetic drinking water value per footnote {E}.

EE - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

BOLD value indicates an exceedance of one or more of the listed criteria.

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Groundwater Sampling Results (Analytical)
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Chronic-Based Mixing Zone GSI Criteria^	Acute-Based Mixing Zone GSI Criteria^	Sample Location: **MW-52** Sample Date: 3/5/2024 Downgradient/ GSI	**MW-53** 3/5/2024 Downgradient/ GSI	**MW-53R** 3/5/2024 Downgradient/ GSI	**MW-54R** 3/5/2024 Downgradient/ GSI	**MW-55** 3/5/2024 Downgradient/ GSI	**OW-57ROUT** 3/6/2024 Downgradient
Appendix III(1)													
Boron	ug/L	NC	**500**	**500**	**4,000**	44,000	69,000	**945**	**5,740**	**2,300**	**5,940**	**825**	**1,810**
Calcium	mg/L	NC	NC	NC	**500**EE	NC	NC	237	134	173	170	166	123
Chloride	mg/L	250**	250E	250E	**50**	NC	NC	34	**77**	35	**62**	18	**68**
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,230
Sulfate	mg/L	**250****	**250**E	**250**E	**500**EE	NC	NC	**540**	25	53	49	224	79
Total Dissolved Solids	mg/L	**500****	**500**E	**500**E	**500**	NC	NC	**1,380**	**694**	**862**	**752**	**866**	**770**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5E	6.5 - 8.5E	6.5 - 9.0	NC	NC	7.0	7.5	7.0	7.0	6.9	7.2
Appendix IV(1)													
Antimony	ug/L	6	6.0	6.0	2.0	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	100	680	< 1	1	9	1	**46**	1
Barium	ug/L	2,000	2,000	2,000	1,200	NC	NC	94	654	165	97	260	81
Beryllium	ug/L	4	4.0	4.0	33	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	NC	NC	1	1	1	1	< 1	2
Cobalt	ug/L	NC	40	100	100	NC	NC	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,230
Lead	ug/L	NC	4.0	4.0	14	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	NC	NC	27	50	56	76	26	28
Mercury	ug/L	2	2.0	2.0	0.20#	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	NC	NC	< 5	< 5	< 5	15	27	6
Radium-226	pCi/L	NC	NC	NC	NC	NC	NC	--	--	--	--	--	--
Radium-228	pCi/L	NC	NC	NC	NC	NC	NC	--	--	--	--	--	--
Radium-226/228	pCi/L	5	NC	NC	NC	NC	NC	--	--	--	--	--	--
Selenium	ug/L	50	50	50	5.0	55	120	2	3	2	3	1	< 1
Thallium	ug/L	2	2.0	2.0	2.0	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115(2)													
Iron	ug/L	**300****	**300**E	**300**E	500,000EE	NC	NC	**3,120**	**947**	**752**	**159**	**18,700**	44
Copper	ug/L	1,000**	1,000E	1,000E	20	NC	NC	2	1	2	2	1	2
Nickel	ug/L	NC	100	100	120	NC	NC	< 2	< 2	< 2	< 2	< 2	12
Silver	ug/L	100**	34	98	0.2	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	NC	NC	< 2	2	< 2	< 2	< 2	< 2
Zinc	ug/L	5,000**	2,400	5,000E	260	NC	NC	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

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- If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

E - Criterion is the aesthetic drinking water value per footnote {E}.

EE - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

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(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

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All metals were analyzed as total unless otherwise specified.

Table 5
Summary of Confidence Interval Evaluation: March 2024
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Assessment Monitoring Statistical Evaluation

Constituent	Units	GWPS	MW-50		MW-51		MW-52		MW-53		MW-53R		MW-54R		MW-55		OW-57R OUT		JCW-MW-18001		JCW-MW-18005		JCW-MW-18006	
			LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL
Boron[(1)]	ug/L	560	**1,400**	2,100	**830**	1,300	**960**	1,200	**2,800**	5,400	**1,800**	2,400	**4,700**	6,000	**730**	1,200	**1,700**	1,900	**1,400**	1,700	**920**	1,300	**2,000**	2,800
Calcium	mg/L	280	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**520**	680	160	300	**--**	--
Sulfate	mg/L	780	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**1,700**	2,300	**--**	--	**--**	--
Arsenic	ug/L	21	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	--[(2)]	--[(2)]	**--**	--	**--**	--	**--**	--	15	25
Molybdenum	ug/L	73	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	--[(2)]	--[(2)]	**--**	--	**--**	--	**--**	--	**--**	--
Iron	ug/L	28,000	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--	**--**	--

GSI Statistical Evaluation

Constituent	Units	GSI	MW-55	
			LCL	UCL
Arsenic	ug/L	100	44	97

Notes:

ug/L - micrograms per Liter

mg/L - milligrams per Liter

-- - Not Applicable; well/parameter pair did not directly exceed the applicable criterion and was not included in further analysis.

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated April 23, 2021

GSI - Groundwater Surface Water Interface Criteria; GSI criteria is the generic Michigan Part 201 GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

UCL - Upper Confidence Limit (α = 0.01) of the downgradient data set.

LCL - Lower Confidence Limit (α = 0.01) of the downgradient data set.

1,300	Indicates a statistically significant exceedance of the GWPS (detection monitoring constituent). An exceedance occurs when the LCL is greater than the criterion.
1,300	Indicates a statistically significant exceedance of the GWPS (assessment monitoring constituent). An exceedance occurs when the LCL is greater than the criterion.
1,300	Indicates a statistically significant exceedance of the applicable GSI criterion. An exceedance occurs when the LCL is greater than the criterion.

(1) Boron concentrations were confirmed as a statistically significant increase (SSI) over background levels and triggered assessment monitoring (2017 Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit, TRC, 2018).

(2) The concentrations of arsenic and molybdenum at MW-55 are not a result of a release from the unit, as detailed in the Alternate Source Demonstration (2021 Annual Groundwater Monitoring and Corrective Action Report, TRC, January 2022); therefore, confidence intervals were not calculated for comparison to GWPSs.,

Table 6
EGLE Exceedance Summary Table
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
SUMMARY OF STATISTICAL EXCEEDANCES

Data is in	**(X) ug/L**	**or**
	( ) mg/L	
unless otherwise stated		

Facility: JC Weadock – WDS# 395457

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	1 Qtr. 2024 (**bold** >201)	4 Qtr. 2023 (**bold** >201)	3 Qtr. 2023 (**bold** >201)	2 Qtr. 2023 (**bold** >201)

No Exceedances at Compliance Locations

Table 7
Leachate Headwell Results
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Parameter	Reporting Limit	Units	2024 Field Leachate Resample		2023 Field Leachate	
			LH-103R	LH-104	LH-103R	LH-104
			3/6/2024		10/4/2023	
Indicator Parameters						
Dissolved Oxygen	0.1	mg/L	0.87	2.5	1.60	0.50
O.R.P.	1	mV	-98.5	-51.3	-167.0	-89.3
pH	0.05	S.U.	6.98	8.55	7.04	7.46
Specific Conductance	1	uS/cm	2,795	928	3,114	1,089
Metals						
Mercury (low-level)(1)	0.5	ng/L	<0.5 | <0.5	0.67 | 0.68	1.01 | 0.82	<0.5 | <0.5

Notes:

mg/L = milligrams per liter

ng/L = nanograms per liter

mV = millivolts

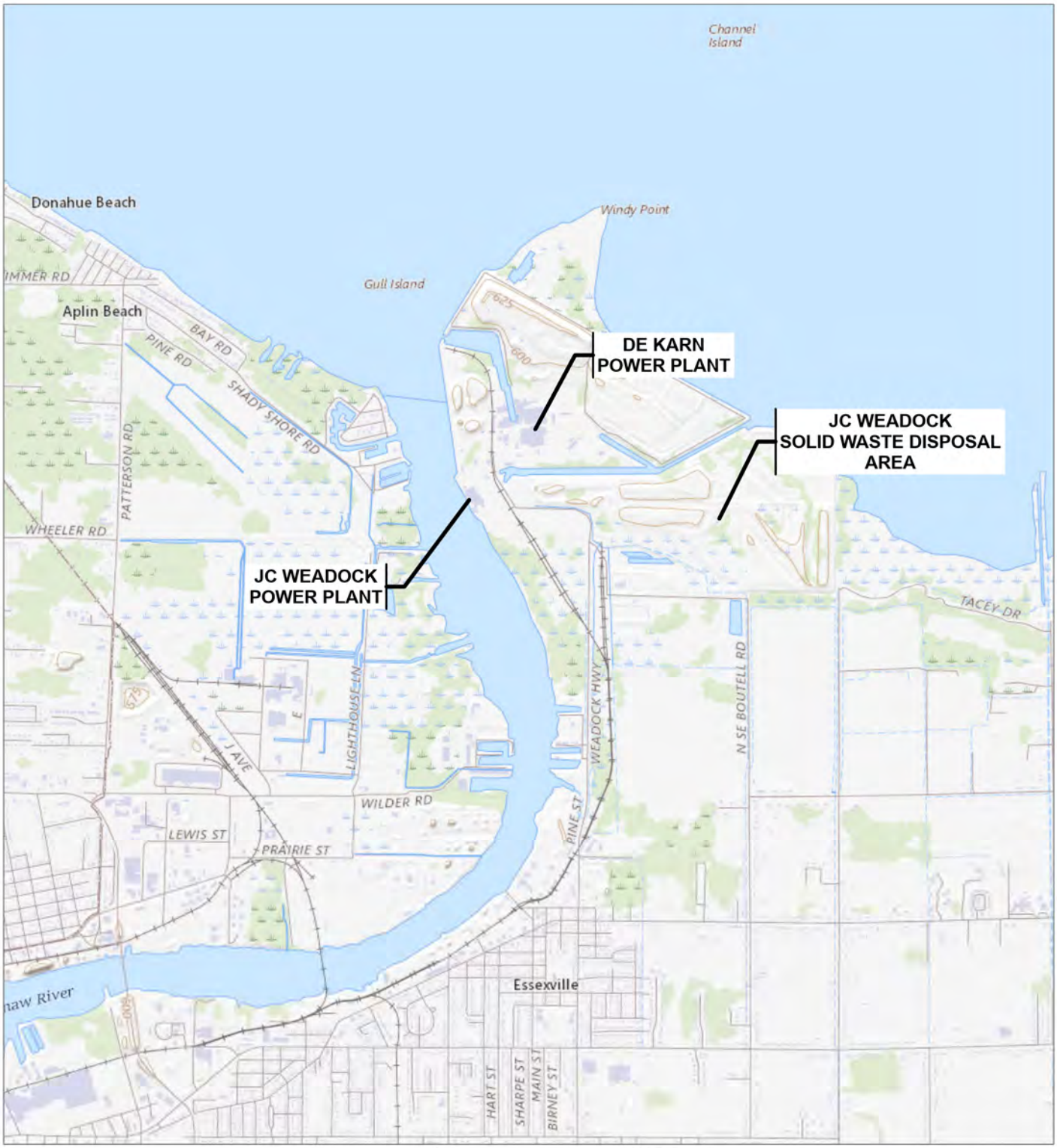
S.U. = standard units

uS/cm = microSiemens per centimeter

O.R.P. = oxidation-reduction potential

(1) Primary sample result | Duplicate sample result

Figures



0 1,500 3,000

FEET

1:36,000 1" = 3,000'

BASE MAP: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

PROJECT:
CONSUMERS ENERGY COMPANY
DE KARN AND JC WEADOCK POWER PLANTS
ESSEXVILLE, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	A. ADAIR	PROJ. NO.:	553828.0000
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		FIGURE 1
DATE:	APRIL 2024		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: 464096_WEADOCK

LEGEND

- BACKGROUND MONITORING WELL
- JCW BOTTOM ASH POND MONITORING WELL
- JCW LANDFILL HMP WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- LEACHATE HEADWELL
- DECOMMISSIONED WELL
- SLURRY WALL (APPROXIMATE)

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022)
2. MONITORING WELL AND SLURRY WALL LOCATIONS PROVIDED BY CEC; SG21733SHT2 REVB.DWG DATED 11/21/2018
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).

1:7,200
1" = 600'
0 600 1,200 FEET

PROJECT:	CONSUMERS ENERGY COMPANY JC WEADOCK POWER PLANT ESSEXVILLE, MICHIGAN
TITLE:	SITE MAP
DRAWN BY: A. ADAIR	PROJ. NO.: 553828.0000
CHECKED BY: J. KRENZ	
APPROVED BY: D. LITZ	FIGURE 2
DATE: APRIL 2024	

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734 971 7080

FILE: 464096_Weadock.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0
Saved By: AADAIR on 4/24/2024 - 13:28:39 PM; File Path: T:\1-PROJECTS\Consumers_Energy\464096_Weadock\2-APRX\464096_Weadock.aprx; Layout Name: 514403-1024-002

Lake Huron
Saginaw Bay
(578.68) NOTE 3

DE KARN
GENERATING FACILITY

FORMER BOTTOM
ASH POND

DISCHARGE CHANNEL

SLURRY WALL

FORMER
JC WEADOCK
GENERATING FACILITY

LANDFILL

TACEY DRAIN

UNDERWOOD DRAIN

Saginaw River

JCW-MW-15010 (579.73)
JCW-MW-18001 (578.78)
JCW-OW-18001 (589.24)
JCW-MW-15009 (580.24)
JCW-MW-15007 (584.38)
JCW-MW-15028 (581.84)
JCW-MW-18006 (587.99)
JCW-OW-18006 (593.59)
OW-61 (595.95)
OW-57RIN (585.06)
OW-57IN (584.98)
OW-57ROUT (581.40)
OW-57OUT (582.66)
OW-56R (586.33)
MW-15008 (581.04)
MW-58 (580.93)
MW-15019 (580.71)
MW-15002 (580.98)
MW-15016 (580.96)
MW-50 (578.83)
JCW-OW-18002 (582.85)
MW-51 (579.05)
OW-51 (584.47)
JCW-OW-18003 (585.71)
MW-52 (578.30)
OW-53 (586.16)
MW-53 (579.10)
MW-53R (578.87)
LH-103R (591.42)
MW-54R (579.14)
OW-54 (587.58)
JCW-OW-18004 (587.83)
JCW-MW-18004 (580.06)
OW-55 (588.51)
LH-104 (588.51)
MW-55 (578.98)
MW-20 (586.57)
JCW-MW-18005 (582.74)

580.0
582.0
584.0
586.0
588.0
590.0
592.0
594.0

LEGEND

- BACKGROUND MONITORING WELL
- JCW BOTTOM ASH POND MONITORING WELL
- JCW LANDFILL HMP WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- LEACHATE HEADWELL
- SLURRY WALL (APPROXIMATE)
- GROUNDWATER ELEVATION CONTOUR (2' INTERVAL, DASHED WHERE INFERRED)
- (590.51) GROUNDWATER ELEVATION (FEET)
- (NU) NOT USED TO DEVELOP CONTOURS

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. MONITORING WELL AND SLURRY WALL LOCATIONS PROVIDED BY CEC, SG21733SHT2 REVB.DWG DATED 11/21/2018.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

N

1:7,200
1" = 600'
0 600 1,200 FEET

PROJECT: CONSUMERS ENERGY COMPANY
JC WEADOCK POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE: POTENTIOMETRIC SURFACE MAP
MARCH 2024

DRAWN BY:	A. ADAIR	PROJ. NO.:	553828
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		FIGURE 3
DATE:	APRIL 2024		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734 971 7080

FILE: 464096_Weadock.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0
Saved By: AADAIR on 4/29/2024 - 10:23:37 AM - File Path: T:\1-PROJECTS\Consumers Energy\464096_Weadock\2-APRX\464096_Weadock.aprx - Layout Name: 553814-1024-003

Appendix A
Static Water Level Evaluation

Table A1
Static Water Levels for Select Perimeter Dike Monitoring Wells and NOAA Staff Gauge
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Well Location	Date Measured	Groundwater Water Elevation (GWE) (ft)	Saginaw Bay Surface Water Elevation (SWE) (ft)	Elevation Difference (GWE-SWE)[(1)]
MW-50	3/4/2024	578.83	578.68	0.15
MW-51	3/4/2024	579.05		0.37
MW-52	3/4/2024	578.30		-0.38
MW-53	3/4/2024	579.10		0.42
MW-53R	3/4/2024	578.87		0.19
MW-54R	3/4/2024	579.14		0.46
MW-55	3/4/2024	578.98		0.30
JCW-MW-18004	3/4/2024	580.06		1.38
Average:		**579.04**		

Notes:

Elevation in feet above North American Vertical Datum 1988 (NAVD 88)

TOC: top of well casing

ft BTOC: feet below top of well casing

(1) Positive elevation difference indicates flow toward the surface water body.

Table A2
Slurry Wall Gradient and Flux
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Monitoring Well Pair Discharge Channel	SWL Obs Well (ft NAVD 88)	SWL MW (ft NAVD 88)	x_{wells} (ft)	i (ft/ft)	Saturated Thickness (ft)	Mean Thickness (ft)	Section Length (ft)	K (cm/sec)	i (ft/ft)	Area (ft^2)	Flow ft^3/day	Flow Gal/day	Flow Gal/yr
JCW-OW-18001	589.24		22.4	4.68E-01	2.00	2.88	1,010	2.30E-08	0.47	2,904	8.85E-02	0.66	242
JCW-MW-18001		578.78			3.75								
JCW-OW-18002	582.85		28.9	1.39E-01	4.00	4.25	970		0.14	4,123	3.74E-02	0.28	102
MW-50		578.83			4.50								

Monitoring Well Pair Adjacent Zone	SWL Obs Well (ft NAVD 88)	SWL MW (ft NAVD 88)	x_{wells} (ft)	i (ft/ft)	Saturated Thickness (ft)	Mean Thickness (ft)	Section Length (ft)	K (cm/sec)	i (ft/ft)	Area (ft^2)	Flow ft^3/day	Flow Gal/day	Flow Gal/yr
OW-51	584.47		14.4	3.77E-01	4.00	3.88	1,850	2.30E-08	0.38	7,169	1.76E-01	1.32	481
MW-51		579.05			3.75								
JCW-OW-18003	585.71		33.9	2.19E-01	3.50	3.01	740		0.22	2,224	3.17E-02	0.24	87
MW-52		578.30			2.51								
OW-53	586.16		20.1	3.51E-01	1.25	1.26	730		0.35	916	2.09E-02	0.16	57
MW-53		579.10			1.26								

Monitoring Well Pair Non-Adjacent Zone	SWL Obs Well (ft NAVD 88)	SWL MW (ft NAVD 88)	x_{wells} (ft)	i (ft/ft)	Saturated Thickness (ft)	Mean Thickness (ft)	Section Length (ft)	K (cm/sec)	i (ft/ft)	Area (ft^2)	Flow ft^3/day	Flow Gal/day	Flow Gal/yr
OW-54	587.58		21.2	3.98E-01	2.00	2.25	510	2.30E-08	0.40	1,148	2.97E-02	0.22	81
MW-54R		579.14			2.50								
JCW-OW-18004	587.83		26.6	2.92E-01	8.00	4.08	820		0.29	3,346	6.37E-02	0.48	174
JCW-MW-18004		580.06			0.16								
OW-55	588.51		24	3.98E-01	2.00	1.49	1,220		0.40	1,818	4.72E-02	0.35	129
MW-55		578.98			0.98								
MW-20	586.57		40.9	9.36E-02	1.50	1.38	1,120		0.09	1,540	9.40E-03	0.07	26
JCW-MW-18005		582.74			1.25								

Calculated Groundwater Discharge from JC Weadock (gal per day)	**=**	**3.78**
(cubic ft per day)	**=**	**0.50**
(cubic ft per min)		**3.5E-04**
Calculated Groundwater Discharge from JC Weadock (gal per yr)	**=**	**1,378**
(cubic ft per yr)	**=**	**184**
Calculated Groundwater Discharge from JC Weadock (gal per year per linear foot of dike)	**=**	**0.15**
(cubic feet per year per linear foot of dike)	**=**	**2.05E-02**

Notes:

Water level data collected on March 4, 2024 are shown by yellow cells: **579.58**

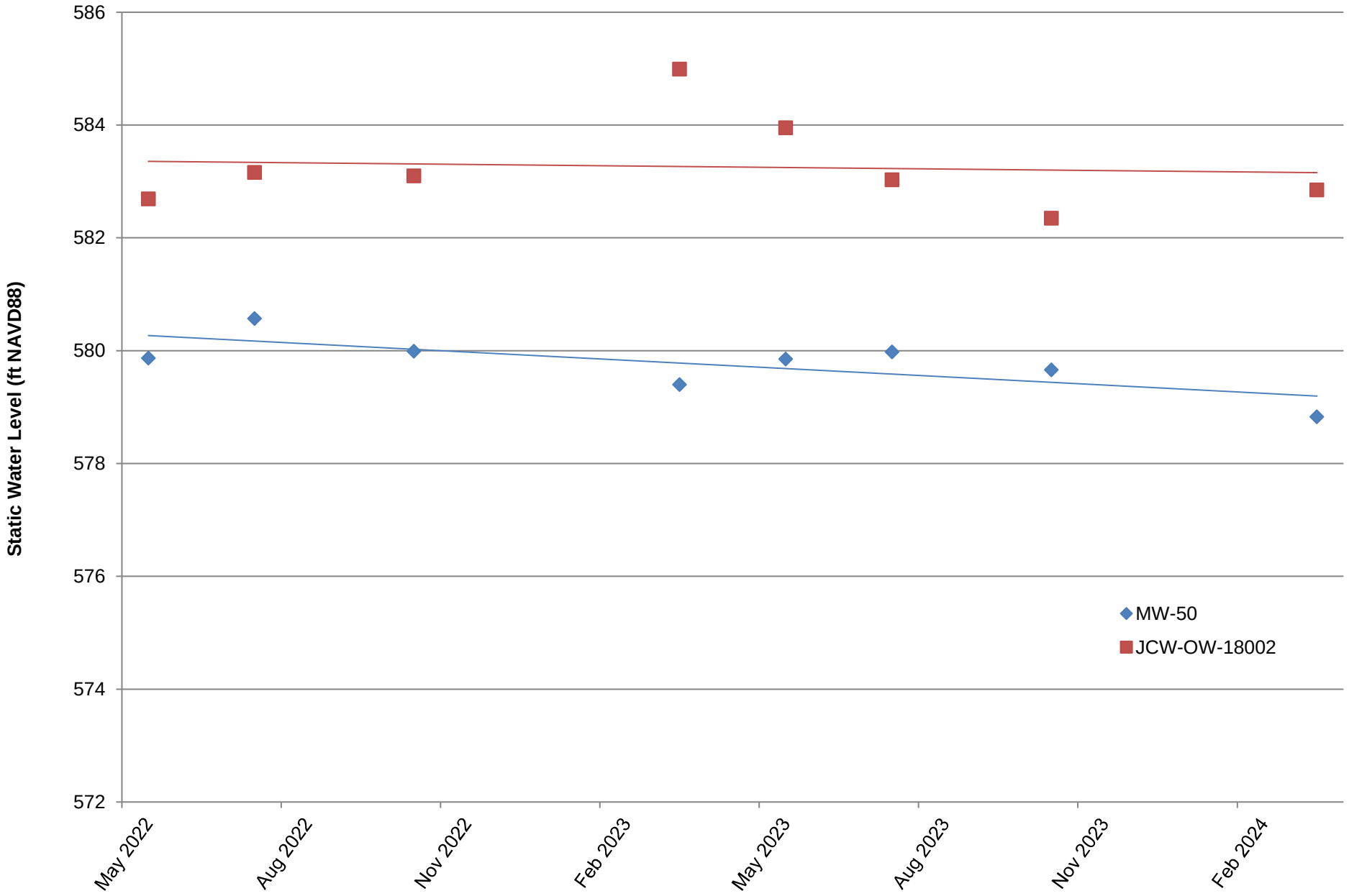
1. Monitoring Well Zones based on Phase II Evaluation, Appendix K Groundwater Discharge Calculations, September 30, 2005. Representative wells based on the Landfill Hydrogeological Monitoring Plan, February 2021.
2. Saturated thickness will be the thickness of the sand unit when the observed SWL is above the top of the sand unit, or the measured saturated thickness of the sand unit if the SWL is below the top of the sand unit.
3. Hydraulic conductivity taken as harmonic mean of laboratory tests done on in-place slurry wall from NTH Certified Quality Assurance Report, Appendix E, April 24, 2009
4. Arithmetic average used to develop geometric properties of each section/zone (e.g. discharge channel, adjacent, and non-adjacent)
5. If Obs well SWL < MW SWL calculated flow will be zero.

SWL = Static Water Level; Obs Well = Observation Well; MW= Monitoring Well; ft NAVD 88 = feet above North American Vertical Datum 1988

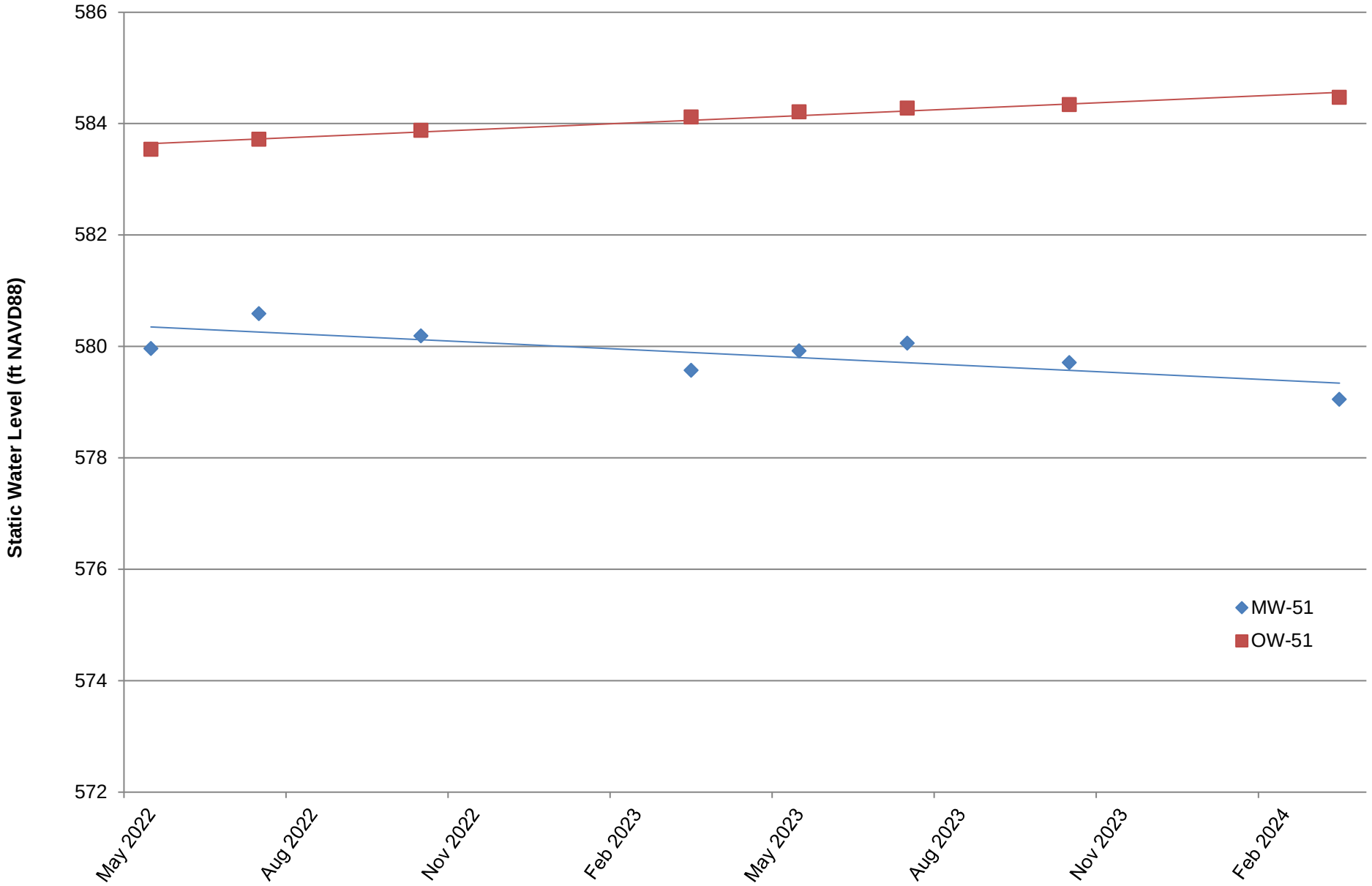
ft/ft = feet per foot; cm/sec = centimeters per second; ft^2 = square feet; ft^3/day = cubic feet per day; Gal/day = gallons per day; Gal/yr = gallons per year

i = hydraulic gradient; K = hydraulic conductivity; x_{wells} = distance between well pairs

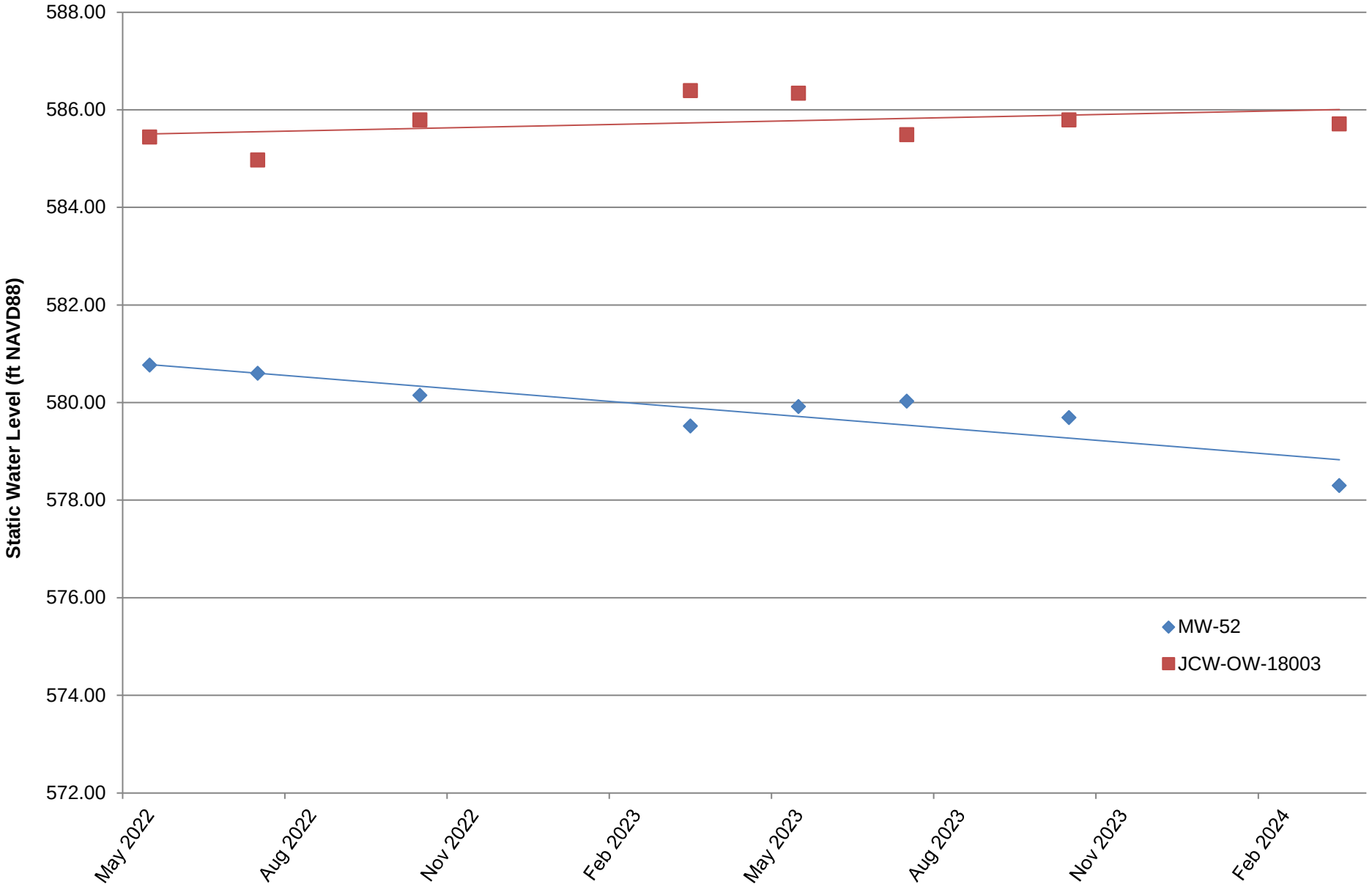
Appendix A
Static Water Level for MW-50 and JCW-OW-18002



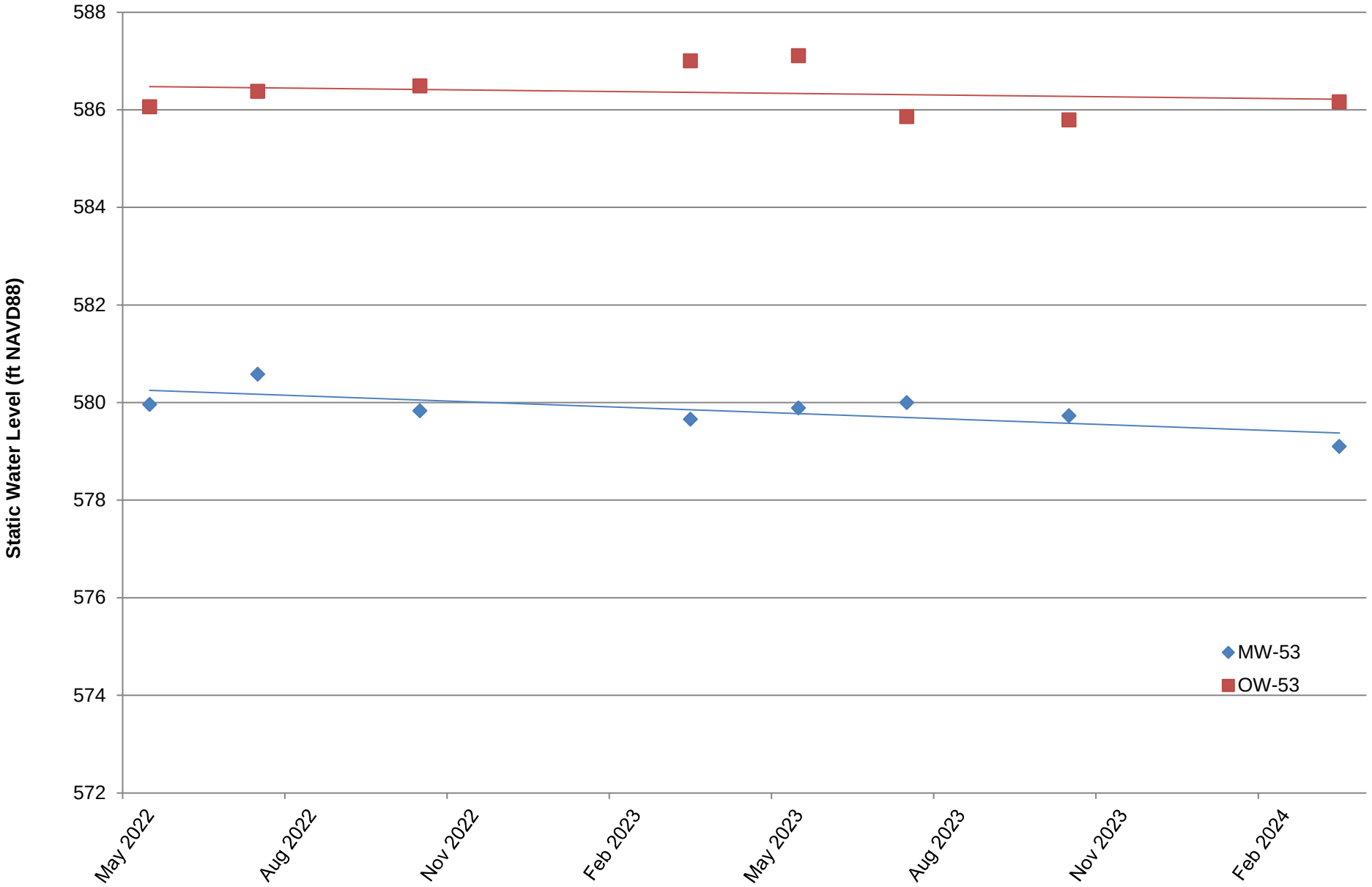
Appendix A
Static Water Level for MW-51 and OW-51



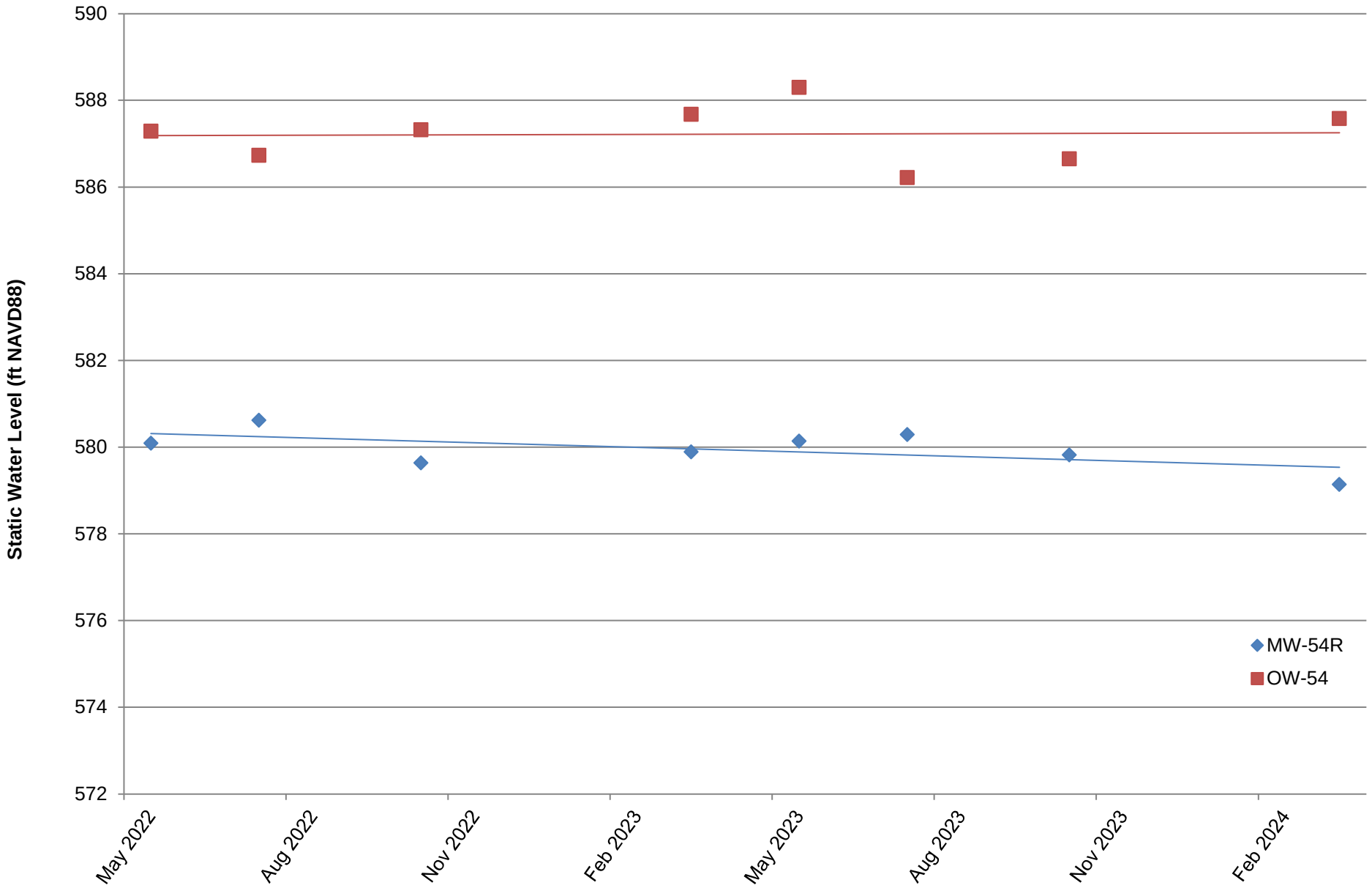
Appendix A
Static Water Level for MW-52 and JCW-OW-18003



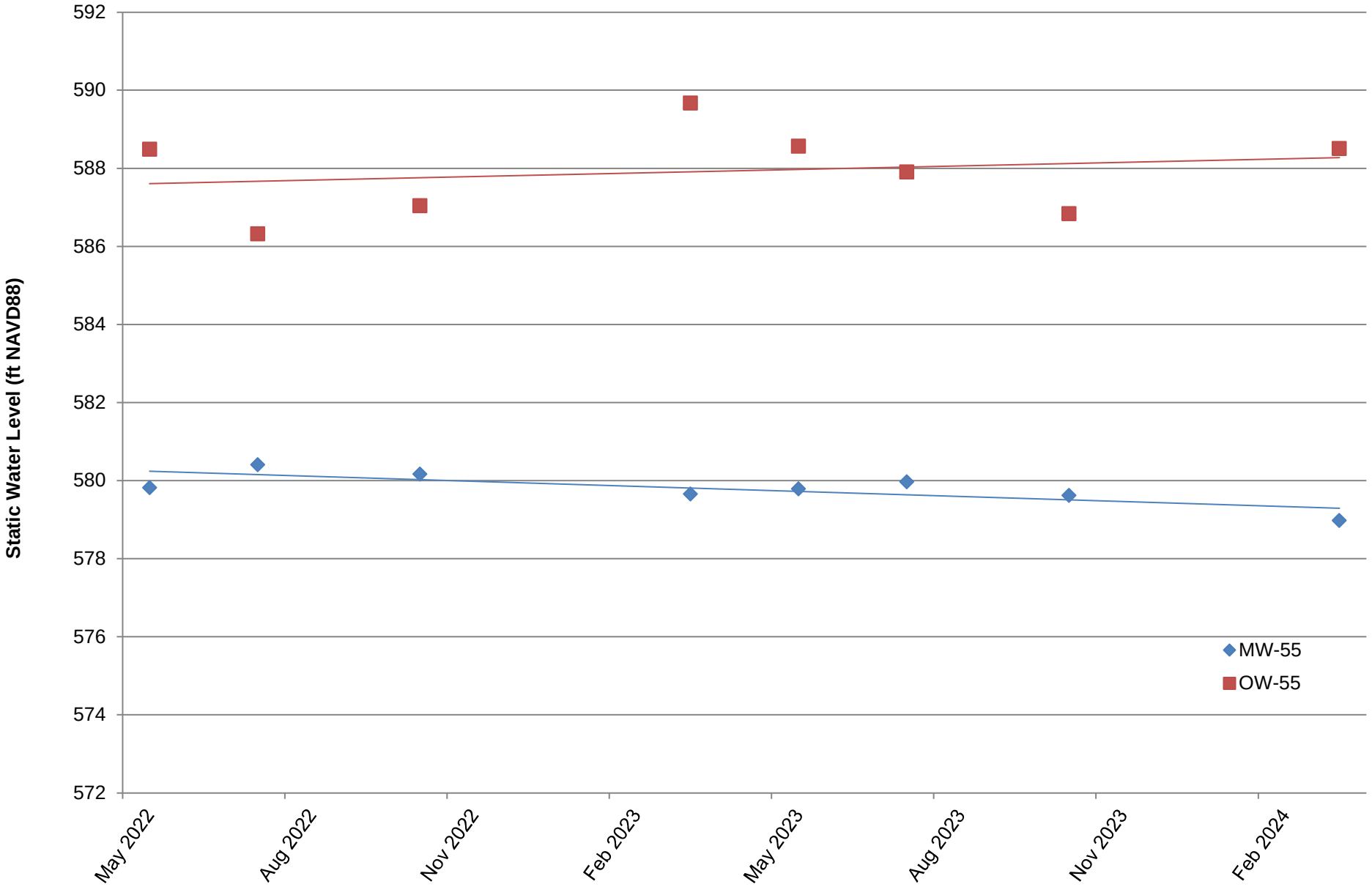
Appendix A
Static Water Level for MW-53 and OW-53



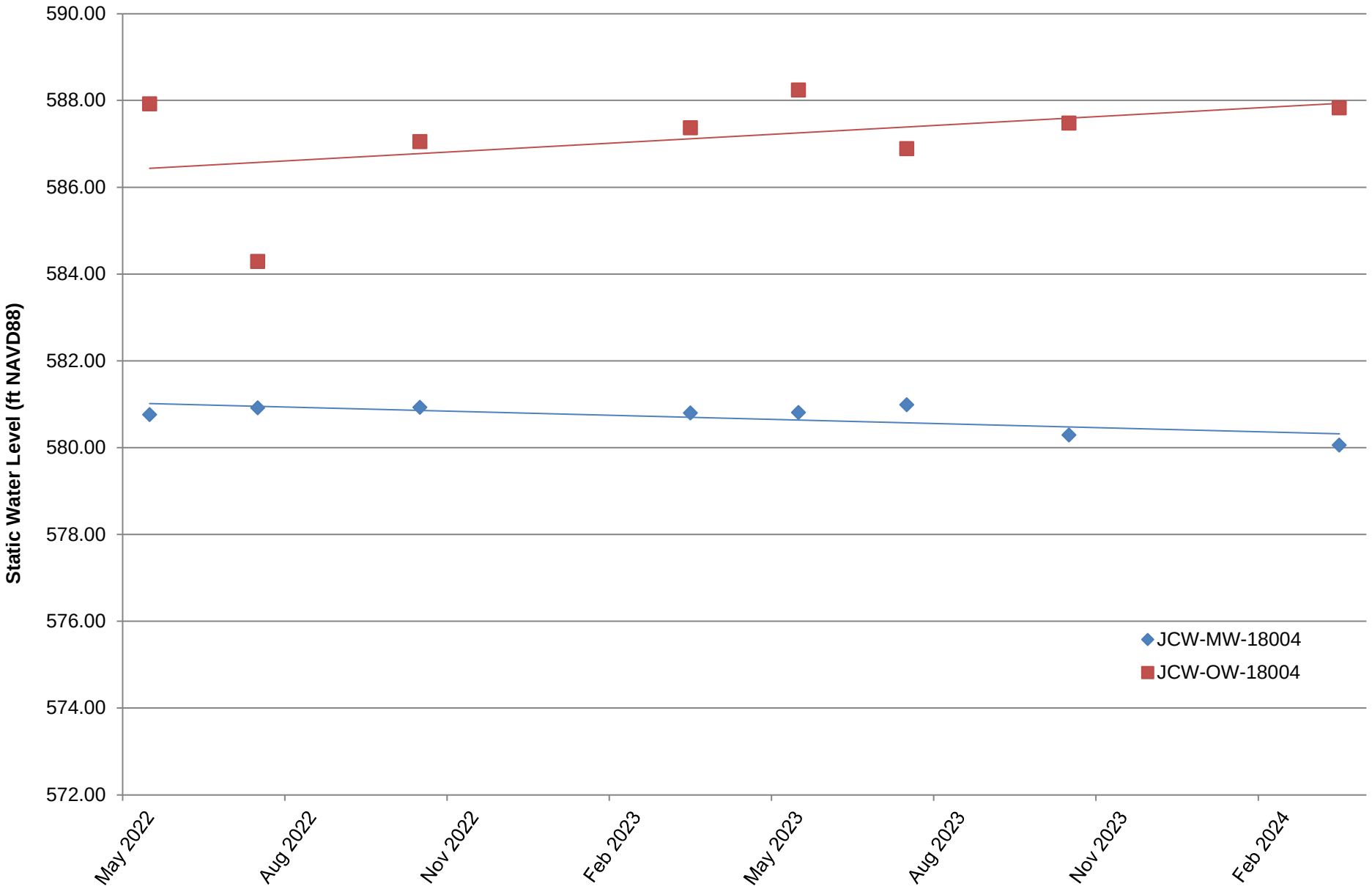
Appendix A
Static Water Level for MW-54R and OW-54



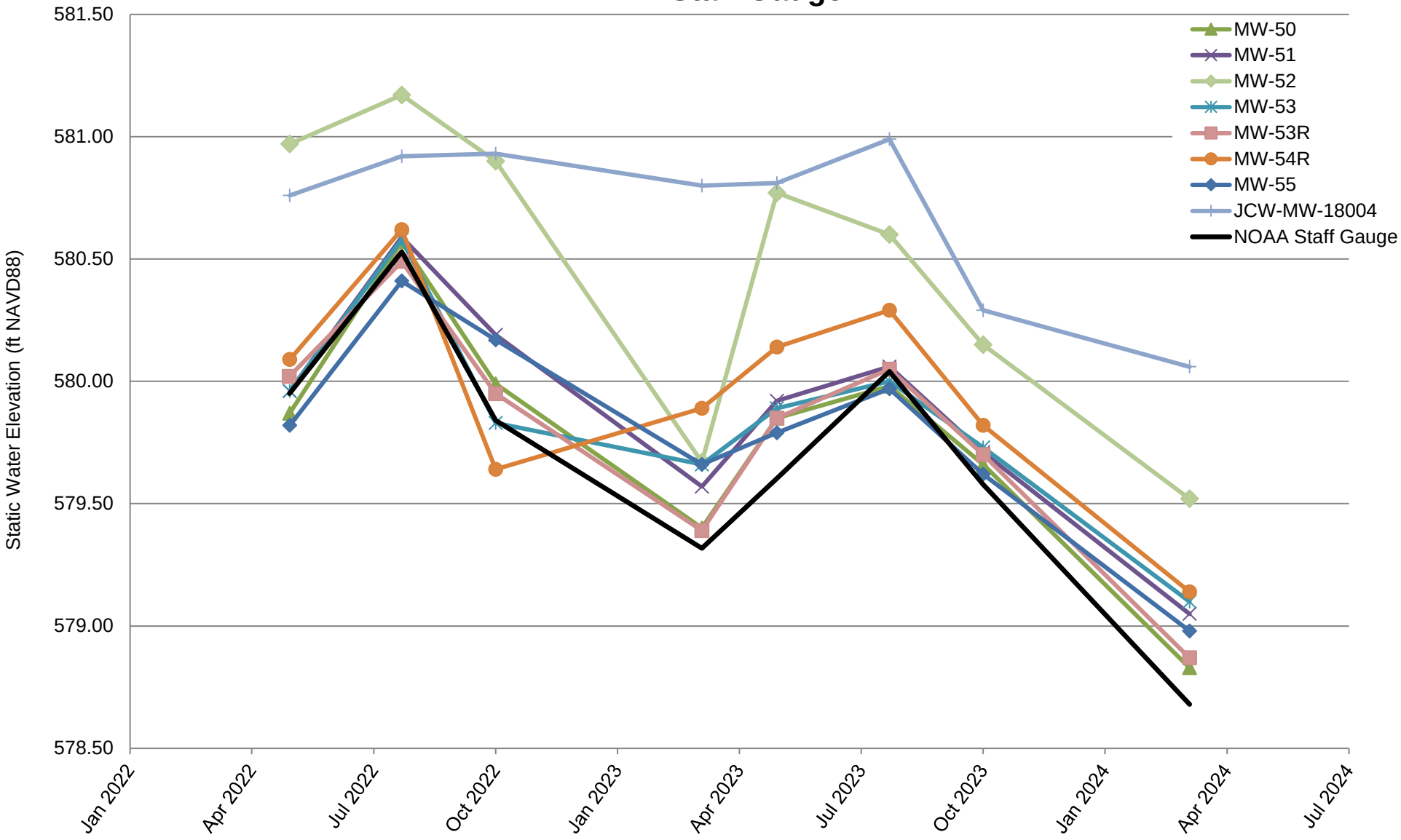
Appendix A
Static Water Level for MW-55 and OW-55



Appendix A
Static Water Level for JCW-MW-18004 and JCW-OW-18004



Appendix A
Static Water Elevations for Select Perimeter Dike Monitoring Wells and NOAA Staff Gauge



Appendix B
Data Quality Review

Laboratory Data Quality Review
Groundwater Monitoring Event March 2024
JC Weadock/DE Karn Background

Groundwater samples were collected by TRC for the March 2024 sampling event. Samples were analyzed for total metals, anions, and total dissolved solids by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0131R.

During the March 2024 sampling event, a groundwater sample was collected from each of the following wells:

- MW-15002
- MW-15008
- MW-15016
- MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and laboratory control samples were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the metals, anions, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III, IV, and additional Part 115 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One field blank (FB-Background) was collected. Calcium, copper, iron, lead, and zinc were detected in FB-Background at 2,410 µg/L, 5 µg/L, 344 µg/L, 2 µg/L, and 13 µg/L, respectively. Potential false positive exists for results for copper and/or zinc that were <10x the field blank concentrations in select samples, as summarized in attachment A.
- Samples DUP-Background/MW-15008 were submitted as the field duplicate pair with this data set; all criteria were met.
- Laboratory duplicate and MS/MSD analyses were not performed on a sample from this data set.

Attachment A
Summary of Data Non-Conformances for Groundwater Analytical Data
JC Weadock/DE Karn Background Wells
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
MW-15002	3/5/2024	Copper	Field blank contamination; potential false positive.
MW-15016	3/5/2024		
MW-15019	3/5/2024		
MW-15002	3/5/2024	Zinc	

Laboratory Data Quality Review
Groundwater Monitoring Event March 2024
JC Weadock Landfill

Porewater samples were collected by TRC for the March 2024 sampling event. Samples were analyzed for total metals, anions, total dissolved solids, and/or alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0132R.

During the March 2024 sampling event, a porewater sample was collected from each of the following wells:

- JCW-MW-18001
- JCW-MW-18004
- JCW-MW-18005
- JCW-MW-18006
- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- MW-58
- OW-57R OUT

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;

- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the metals, anions, TDS, and alkalinity analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III, IV, optional Piper Diagram analyses, and additional Part 115 constituents will be utilized for the purposes of the assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One field blank (FB-01) and one equipment blank (EB-01) were collected. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample JCW-MW-18001 for total metals and anions. The recoveries were within the acceptance limits. Relative percent differences were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- Samples DUP-JCW-LF-02/JCW-MW-18006 and DUP-JCW-LF-01/MW-50 were submitted as the field duplicate pairs with this data set; all criteria between the parent and duplicate samples were within the QC limits with the following exception:

  - The results for nickel were <5x the RL in samples DUP-JCW-LF-02 and JCW-MW-18006 and the absolute difference was greater than the RL. Therefore, the positive results for nickel should be considered estimated in all groundwater samples in this data set except MW-50 and DUP-JCW-LF-01, as summarized in the attached table, Attachment A.

- Laboratory duplicate analyses were not performed on a sample from this data set.

Attachment A
Summary of Data Non-Conformances for Groundwater Analytical Data
JCW Landfill
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
JCW-MW-18001	3/5/2024	Nickel	Field duplicate variability (results <5x the reporting limit [RL] and absolute difference greater than RL); potential uncertainty exists for the listed results.
JCW-MW-18006	3/6/2024		
OW-57ROUT	3/6/2024		
MW-58	3/6/2024		
DUP-JCW-LF-02	3/6/2024		

Laboratory Data Quality Review
Groundwater Monitoring Event March 2024
JCW Alternate Source Demonstration

A groundwater sample was collected by TRC for the March 2024 sampling event. The sample was analyzed for total metals, anions, total dissolved solids, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0133R.

During the March 2024 sampling event, a groundwater sample was collected from the following well:

- JCW-OW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total metals, anions, alkalinity, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data.
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III, IV, optional Piper diagram analyses, and additional Part 115 constituents will be utilized for the purposes of the detection monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- No field blanks or equipment blanks were collected with this data set.
- A field duplicate pair was not submitted with this data set.
- Laboratory duplicate and MS/MSD analyses were not performed on the sample from this data set.

Laboratory Data Quality Review
Groundwater Monitoring Event March 2024
JC Weadock Landfill

Groundwater samples were collected by TRC for the March 2024 sampling event. The samples were analyzed for low-level mercury by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0134.

During the March 2024 sampling event, a groundwater sample was collected from each of the following wells:

- LH-103R
- LH-104

The samples were analyzed for the following constituent:

Analyte Group	Method
Low-Level Mercury	EPA 1631E

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, field blanks, and trip blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures and trip blanks are used to assess potential contamination arising during shipment to the laboratory;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;

- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the low-level mercury analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed constituent, low-level mercury, will be utilized for the purposes of the assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One field blank (FB-02), one trip blank (TB-02), and one equipment blank (EB-02) were collected. Low-level mercury was not detected in these blank samples. It was noted that the RL for low-level mercury in these blank samples (0.2 ng/L) was lower than the field samples (0.5 ng/L).
- MS and MSD analyses were performed on sample LH-103R for low-level mercury. The recoveries were within the acceptance limits. The relative percent difference (RPD) was not provided by the laboratory and therefore was not evaluated; further, MS/MSD concentrations were not provided by the laboratory.
- Samples LH-103R Dup/LH-103R and LH-104 Dup/LH-104 were submitted as the field duplicate pairs with this data set; all criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Appendix C
Detection Monitoring Statistical Trend Tests

Appendix C
Detection Monitoring Statistical Summary for JC Weadock Facility
First Quarter 2024
Data from May 2022 to March 2024

Porewater Monitoring Points						
PARAMETER	**JCW-MW-18001**	**JCW-MW-18004**	**JCW-MW-18005**	**JCW-MW-18006**	**MW-50**	**MW-51**
Boron[(1)]	O	O	O	O	↑*	↓
Calcium	↑ ASD	O	O	O	O	↓
Chloride	O	↑*	O	O	O	O
Fluoride	O*	O*	O*	O*	O*	O*
Iron	↑	O	O	O	O	O
pH/Corrosivity[(1)]	O	O	O	O	O	O
Sulfate	↑ ASD	O	O	↑*	↑*	↓
Total Dissolved Solids	O	O	O	O	O	↓

Notes:

O* = Non-detect (70%)
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (Fourth Quarter 2023 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, January 2024).

(1) Boron concentrations and pH levels were confirmed as statistically significant increases (SSIs) over background levels and triggered assessment monitoring (2017 Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit, TRC, 2018).

Appendix C
Detection Monitoring Statistical Summary for JC Weadock Facility
First Quarter 2024
Data from May 2022 to March 2024

Porewater Monitoring Points						
PARAMETER	**MW-52**	**MW-53**	**MW-53R**	**MW-54R**	**MW-55**	**OW-57R OUT**
Boron[(1)]	O	O	O	↑	O	O
Calcium	O	O	O	O	O	O
Chloride	↓	O	O	O	O	O
Fluoride	O*	O*	O*	O*	O*	O*
Iron	O	O	O	O	O	O
pH/Corrosivity[(1)]	O	O	O	O	O	O
Sulfate	↓	↓*	O	O	O	O
Total Dissolved Solids	O	O	O	O	O	↑*

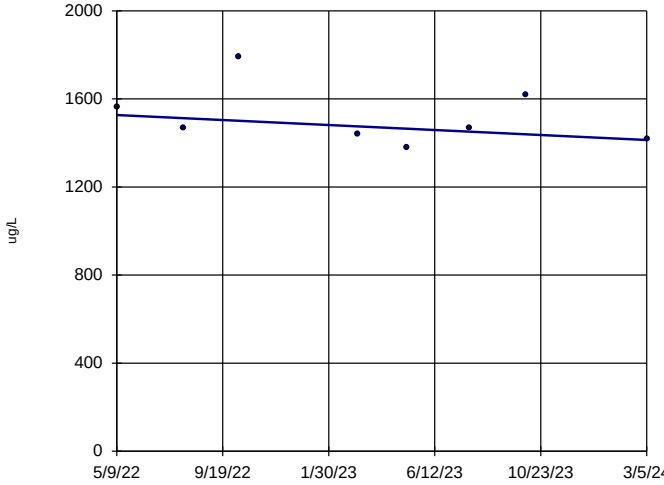
Notes:

O* = Non-detect (70%)
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (Fourth Quarter 2023 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, January 2024).

(1) Boron concentrations and pH levels were confirmed as statistically significant increases (SSIs) over background levels and triggered assessment monitoring (2017 Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit, TRC, 2018).

Boron, Total

JCW-MW-18001



n = 8

Slope = -62.08 units per year.

Mann-Kendall statistic = -7
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

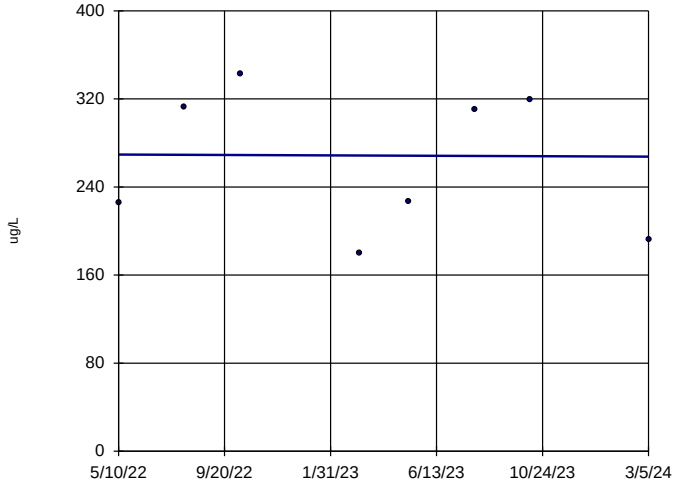
Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

JCW-MW-18004



n = 8

Slope = -1.003 units per year.

Mann-Kendall statistic = 0
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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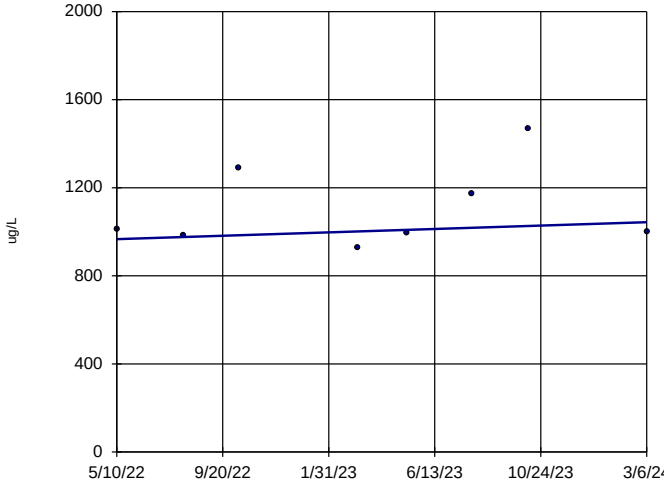
Boron, Total

JCW-MW-18005



n = 8

Slope = 42.36 units per year.

Mann-Kendall statistic = 6
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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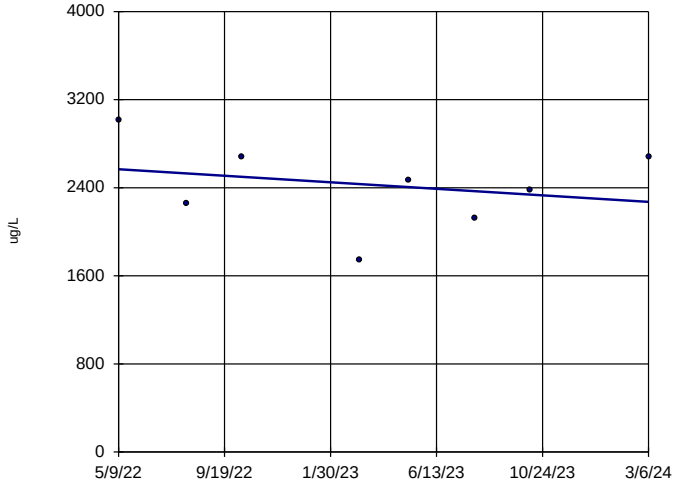
Boron, Total

JCW-MW-18006



n = 8

Slope = -162 units per year.

Mann-Kendall statistic = -4
critical = -17

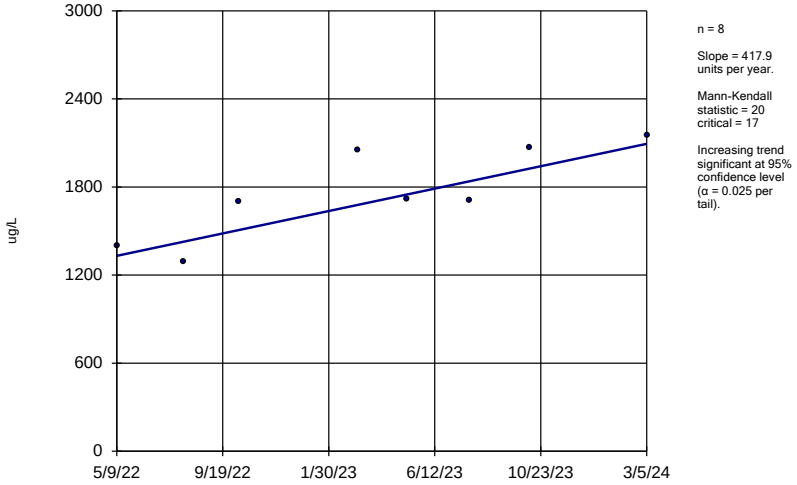
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-50



n = 8

Slope = 417.9 units per year.

Mann-Kendall statistic = 20 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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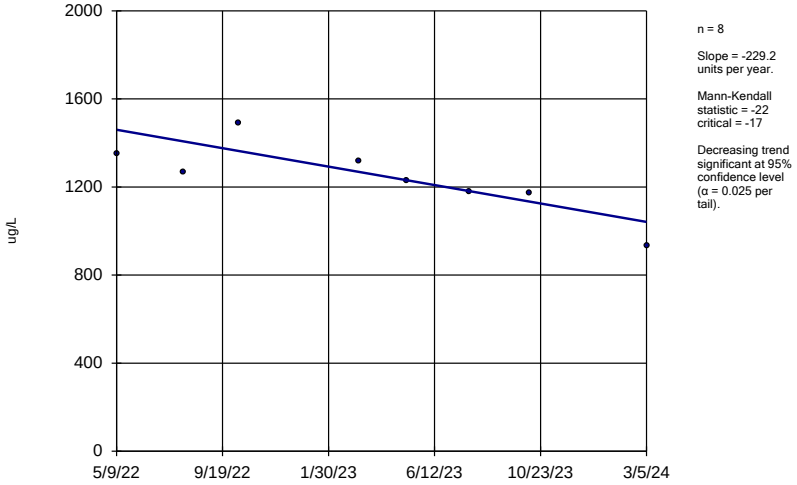
Boron, Total

MW-51



n = 8

Slope = -229.2 units per year.

Mann-Kendall statistic = -22 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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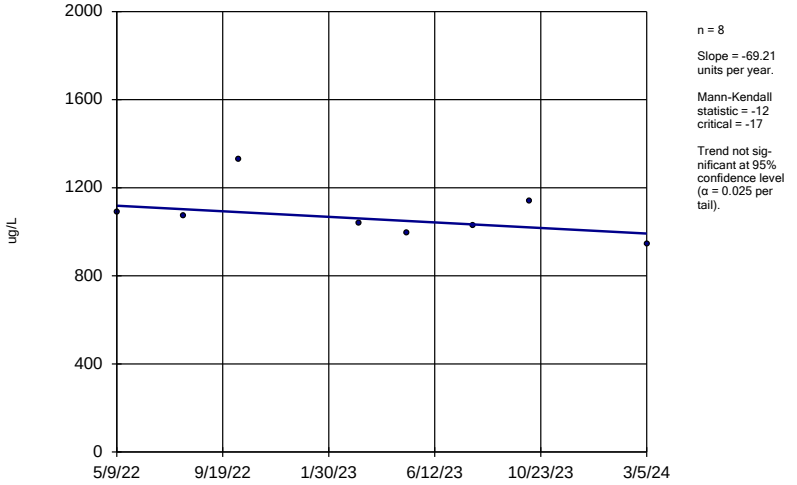
Boron, Total

MW-52



n = 8

Slope = -69.21 units per year.

Mann-Kendall statistic = -12 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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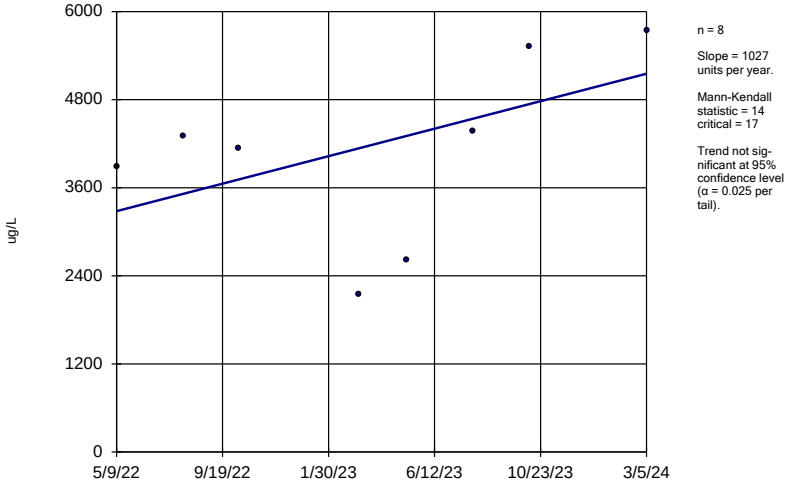
Boron, Total

MW-53



n = 8

Slope = 1027 units per year.

Mann-Kendall statistic = 14 critical = 17

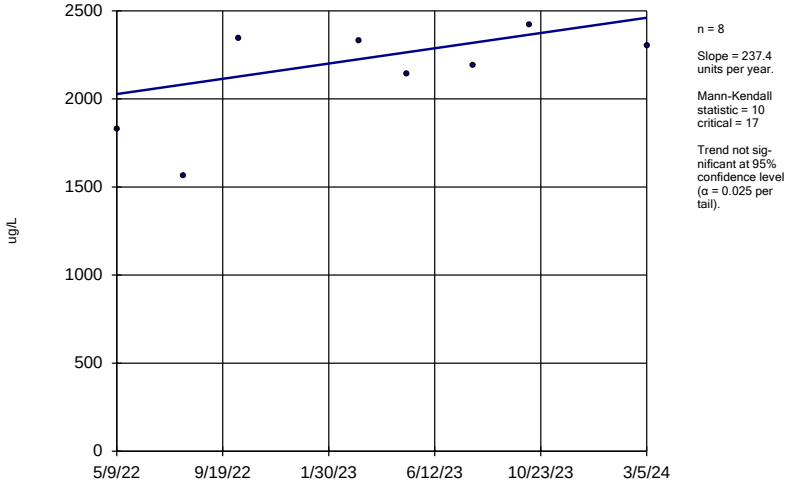
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-53R



n = 8

Slope = 237.4 units per year.

Mann-Kendall statistic = 10 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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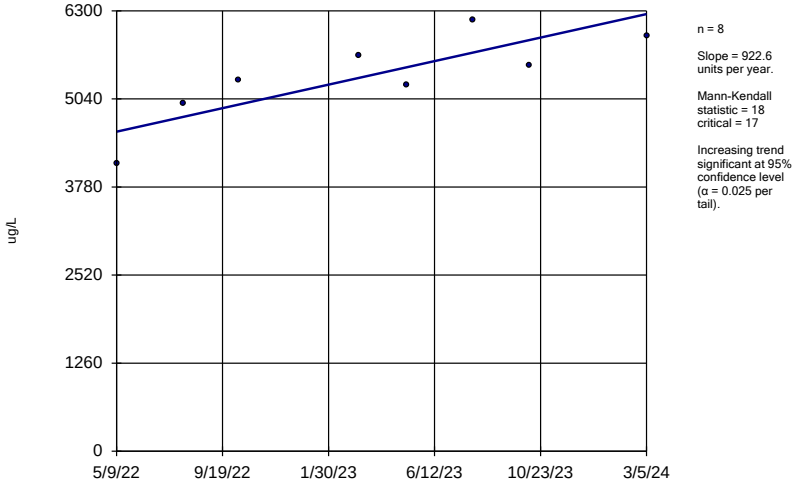
Boron, Total

MW-54R



n = 8

Slope = 922.6 units per year.

Mann-Kendall statistic = 18 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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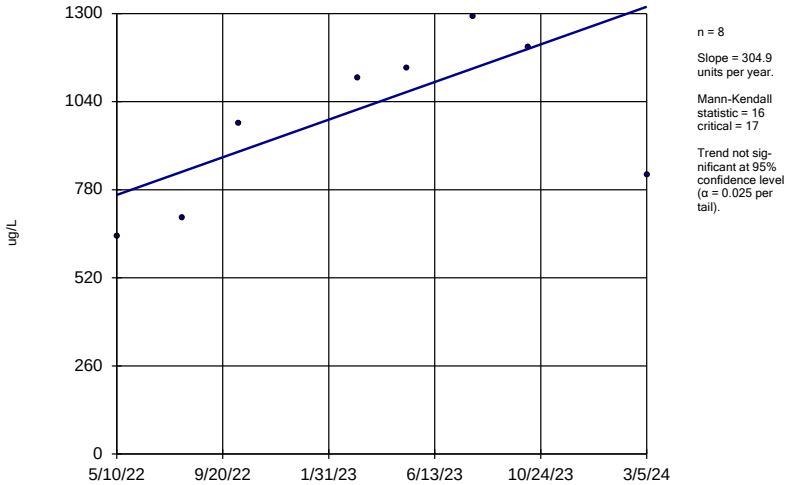
Boron, Total

MW-55



n = 8

Slope = 304.9 units per year.

Mann-Kendall statistic = 16 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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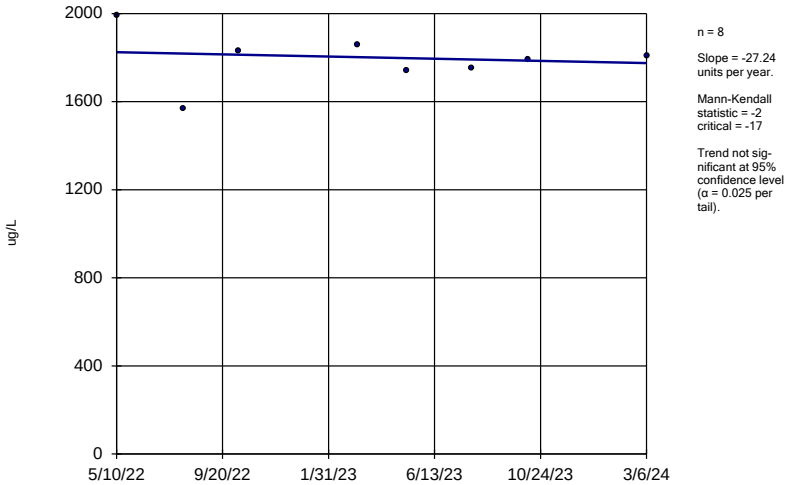
Boron, Total

OW-57ROUT



n = 8

Slope = -27.24 units per year.

Mann-Kendall statistic = -2 critical = -17

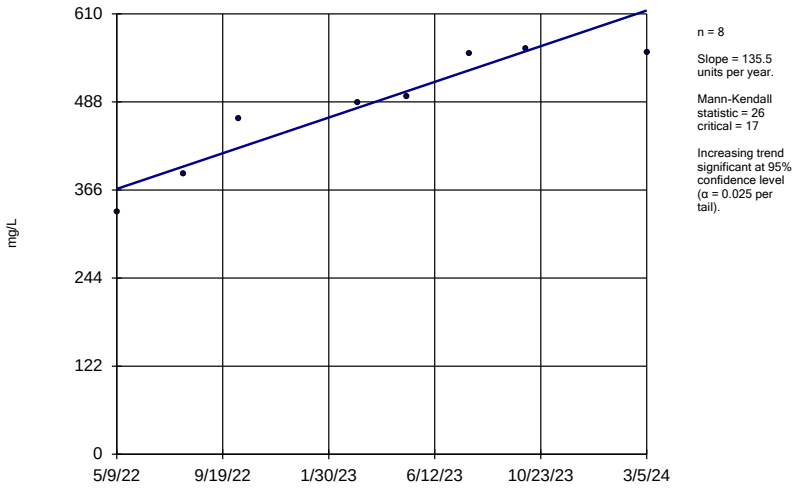
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Calcium, Total

JCW-MW-18001



n = 8

Slope = 135.5 units per year.

Mann-Kendall statistic = 26
critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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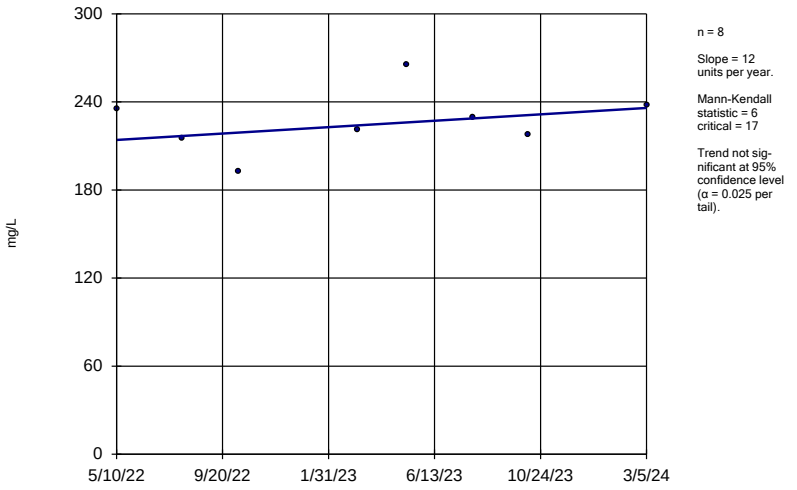
Calcium, Total

JCW-MW-18004



n = 8

Slope = 12 units per year.

Mann-Kendall statistic = 6
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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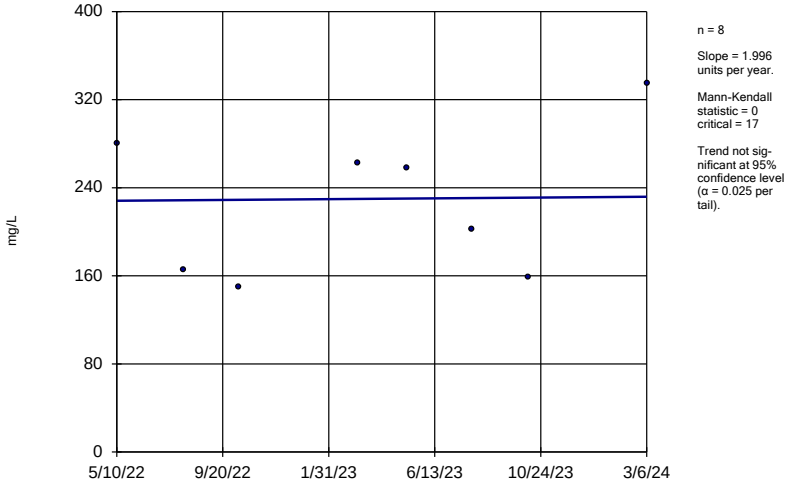
Calcium, Total

JCW-MW-18005



n = 8

Slope = 1.996 units per year.

Mann-Kendall statistic = 0
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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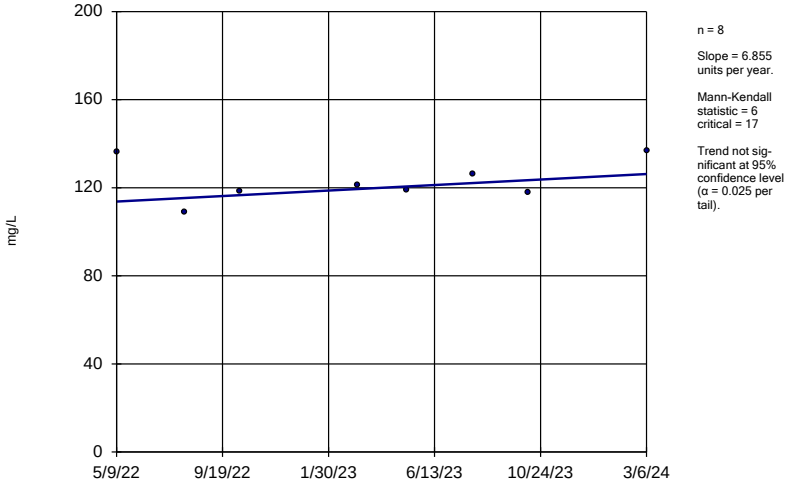
Calcium, Total

JCW-MW-18006



n = 8

Slope = 6.855 units per year.

Mann-Kendall statistic = 6
critical = 17

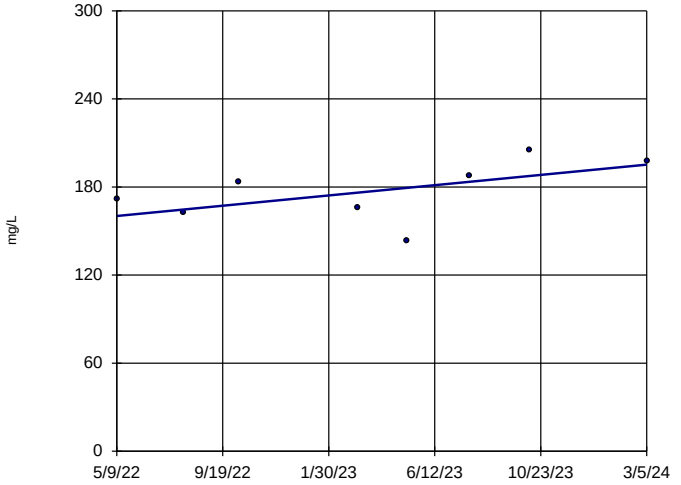
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Calcium, Total

MW-50



n = 8

Slope = 19.16 units per year.

Mann-Kendall statistic = 12 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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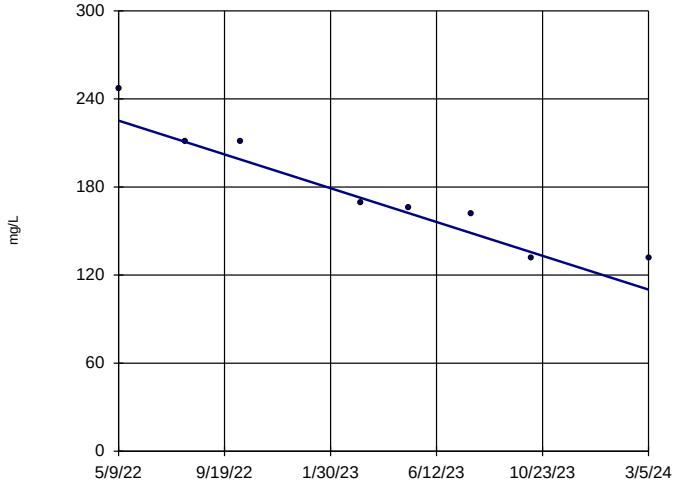
Calcium, Total

MW-51



n = 8

Slope = -63.07 units per year.

Mann-Kendall statistic = -26 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

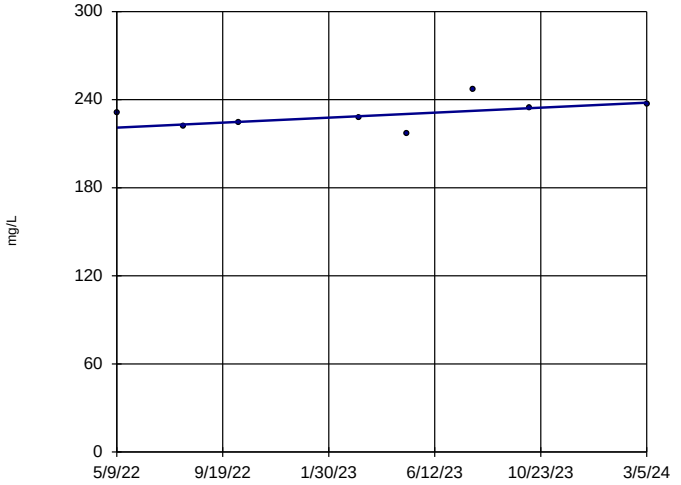
Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-52



n = 8

Slope = 9.337 units per year.

Mann-Kendall statistic = 10 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

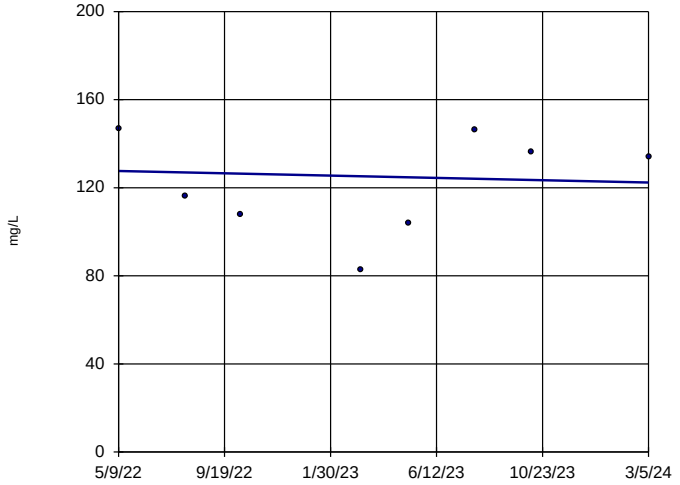
Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-53



n = 8

Slope = -2.874 units per year.

Mann-Kendall statistic = -2 critical = -17

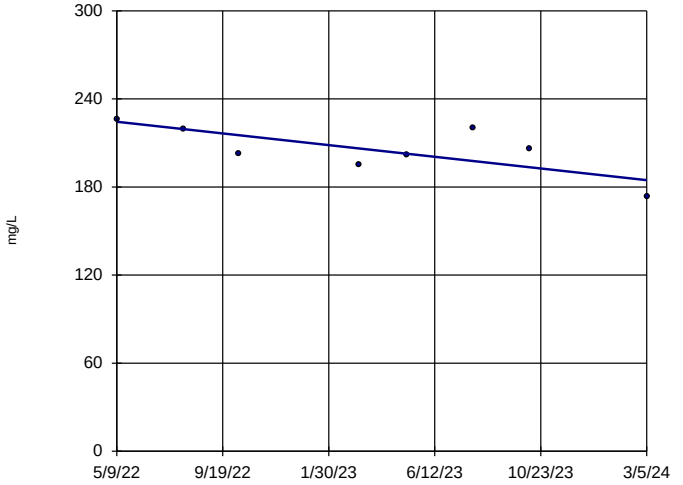
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Calcium, Total

MW-53R



n = 8

Slope = -21.77 units per year.

Mann-Kendall statistic = -12 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

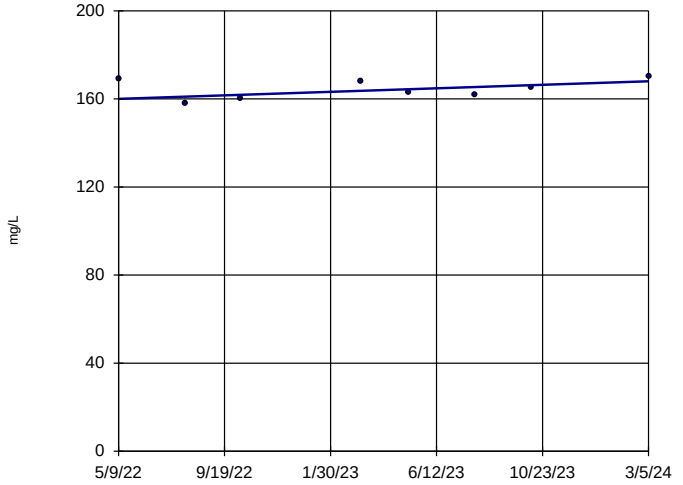
Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-54R



n = 8

Slope = 4.391 units per year.

Mann-Kendall statistic = 8 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

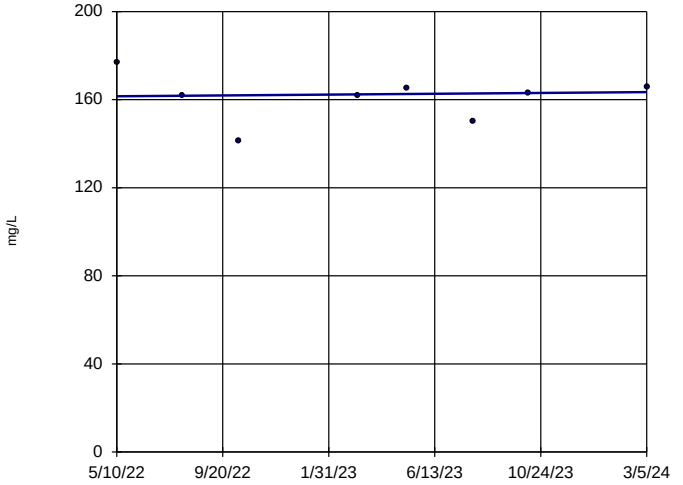
Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-55



n = 8

Slope = 1.027 units per year.

Mann-Kendall statistic = 3 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

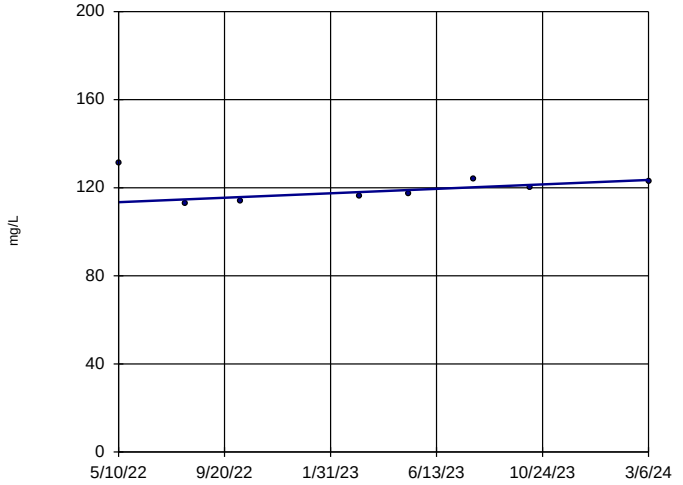
Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

OW-57ROUT



n = 8

Slope = 5.557 units per year.

Mann-Kendall statistic = 10 critical = 17

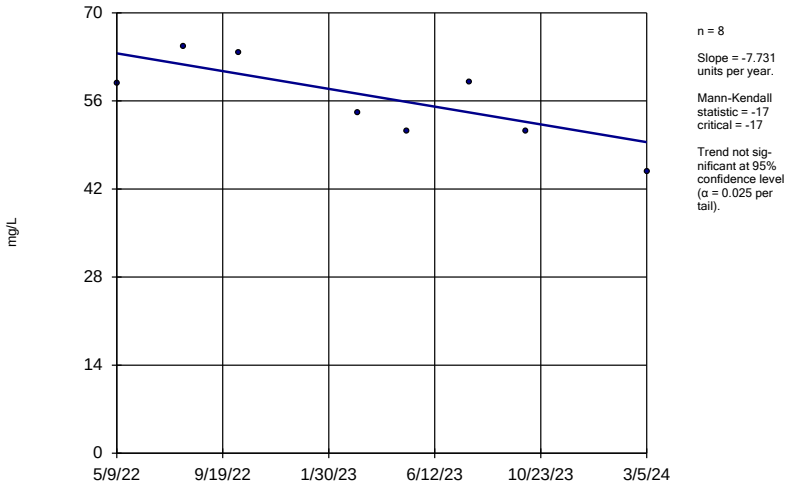
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:37 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Chloride

JCW-MW-18001



n = 8

Slope = -7.731 units per year.

Mann-Kendall statistic = -17
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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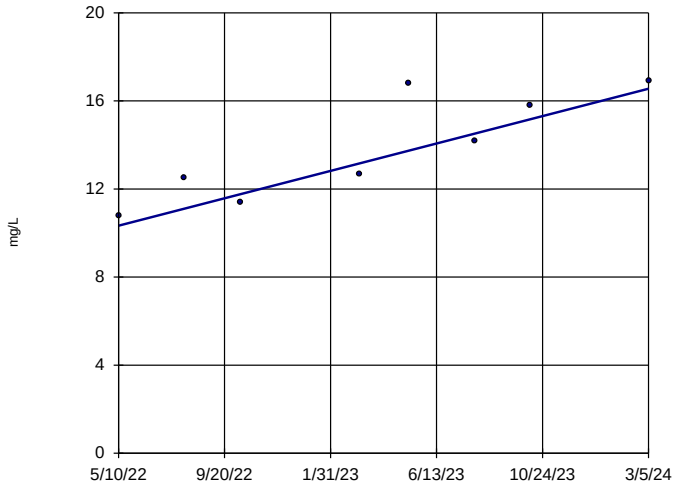
Chloride

JCW-MW-18004



n = 8

Slope = 3.412 units per year.

Mann-Kendall statistic = 22
critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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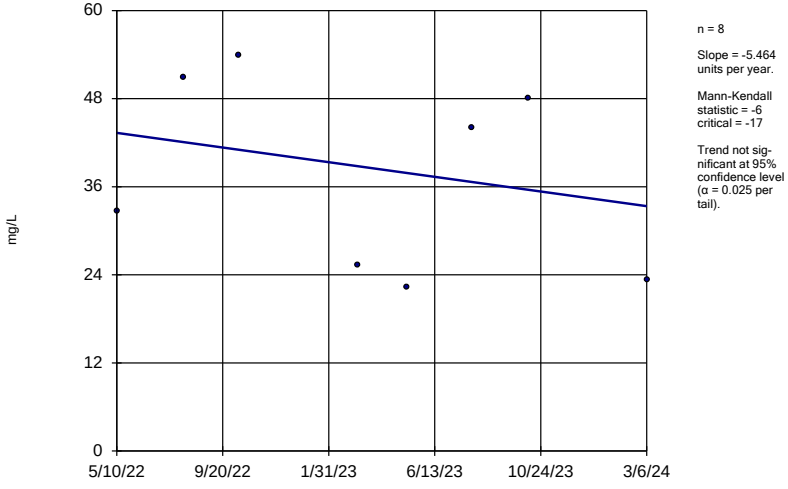
Chloride

JCW-MW-18005



n = 8

Slope = -5.464 units per year.

Mann-Kendall statistic = -6
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

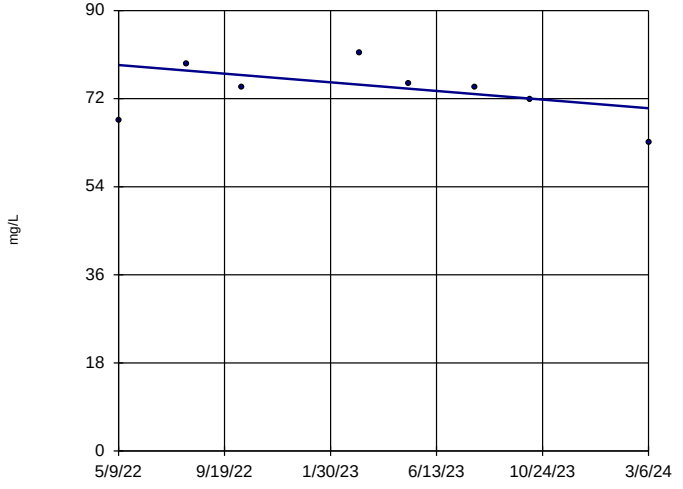
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

JCW-MW-18006



n = 8

Slope = -4.829 units per year.

Mann-Kendall statistic = -9
critical = -17

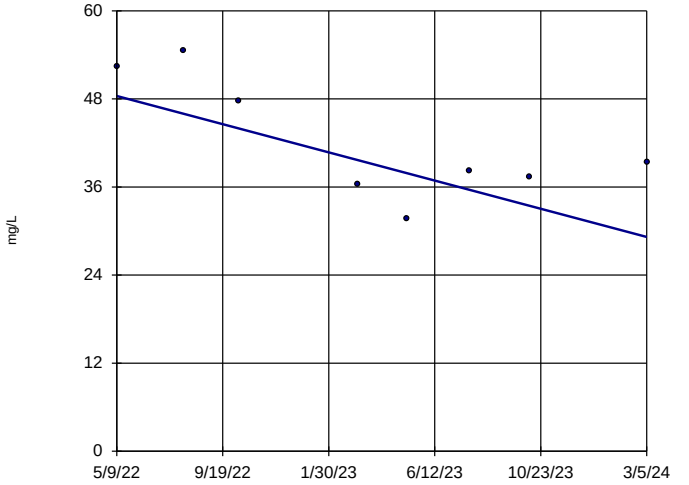
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Chloride

MW-50



n = 8

Slope = -10.53 units per year.

Mann-Kendall statistic = -10
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

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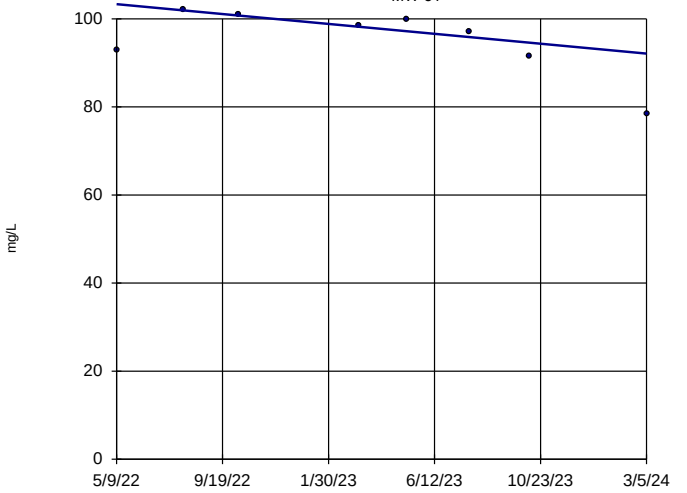
Chloride

MW-51



n = 8

Slope = -6.15 units per year.

Mann-Kendall statistic = -16
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

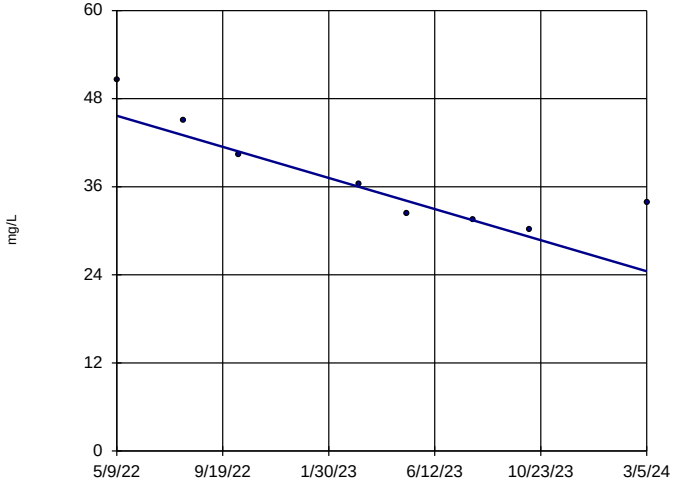
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-52



n = 8

Slope = -11.61 units per year.

Mann-Kendall statistic = -22
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

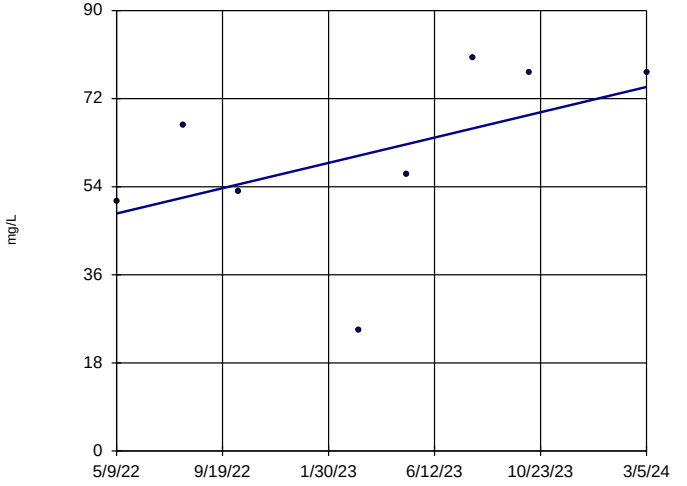
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-53



n = 8

Slope = 14.18 units per year.

Mann-Kendall statistic = 13
critical = 17

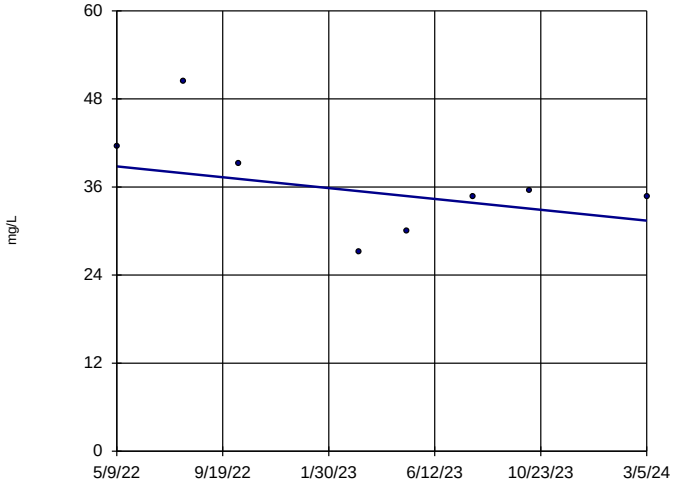
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Chloride

MW-53R



n = 8

Slope = -4.04 units per year.

Mann-Kendall statistic = -8 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

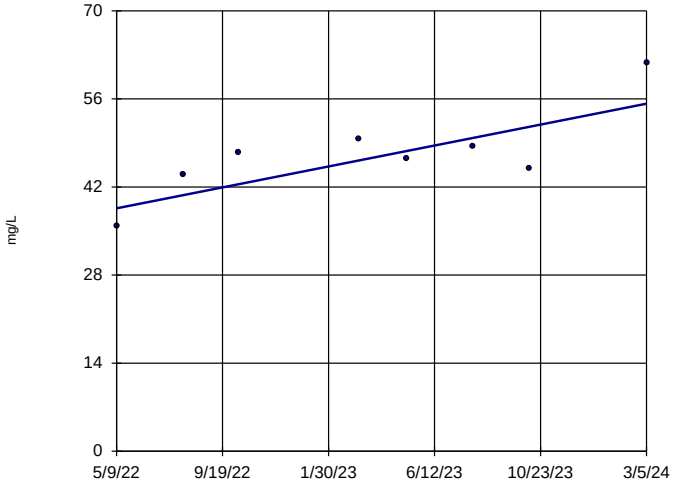
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-54R



n = 8

Slope = 9.126 units per year.

Mann-Kendall statistic = 14 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

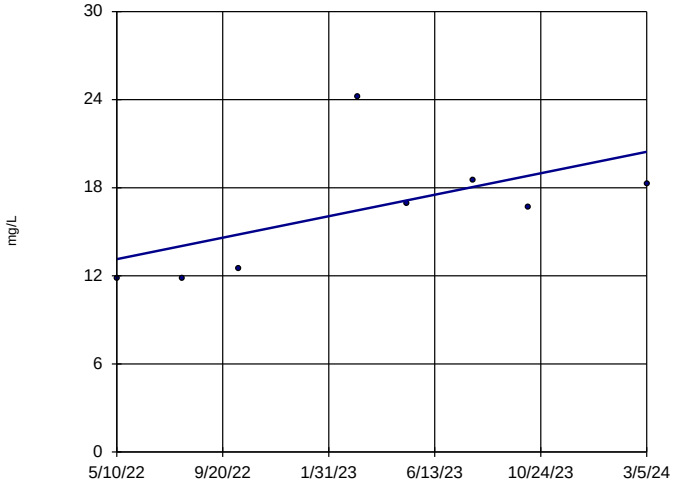
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-55



n = 8

Slope = 4.011 units per year.

Mann-Kendall statistic = 13 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

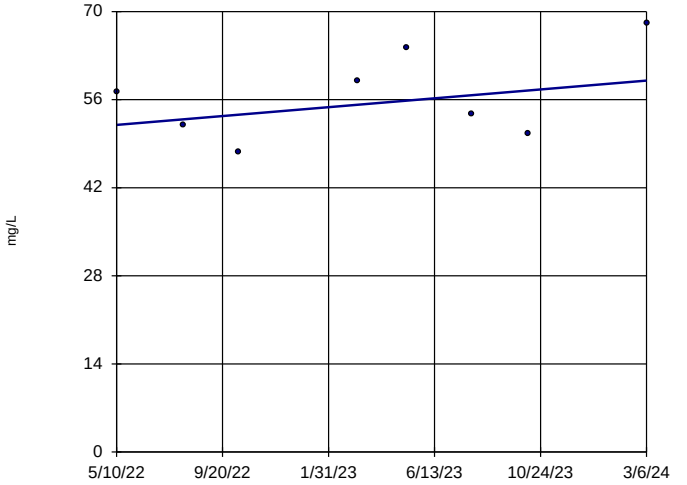
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

OW-57ROUT



n = 8

Slope = 3.865 units per year.

Mann-Kendall statistic = 6 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

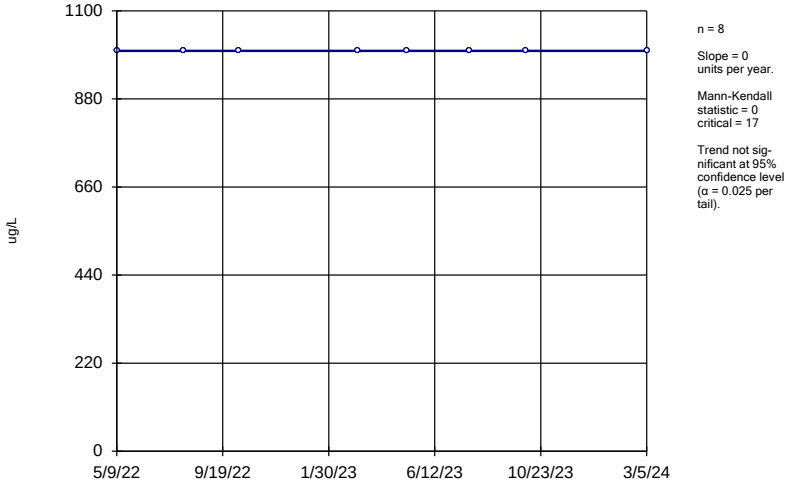
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18001



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

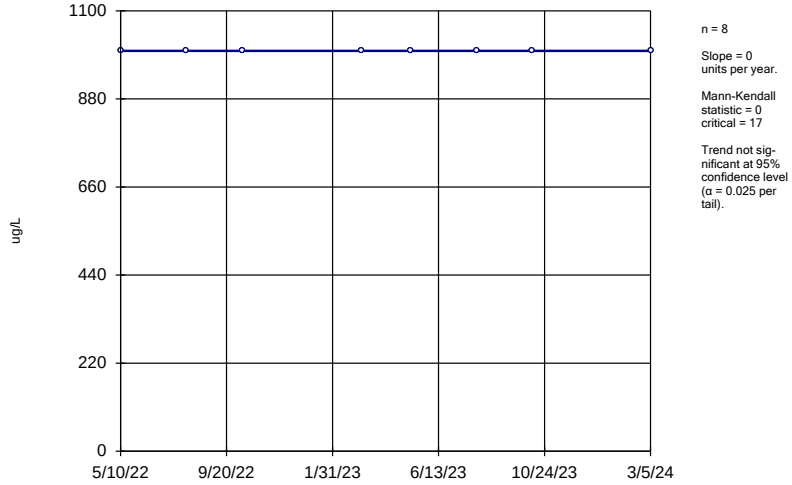
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18004



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

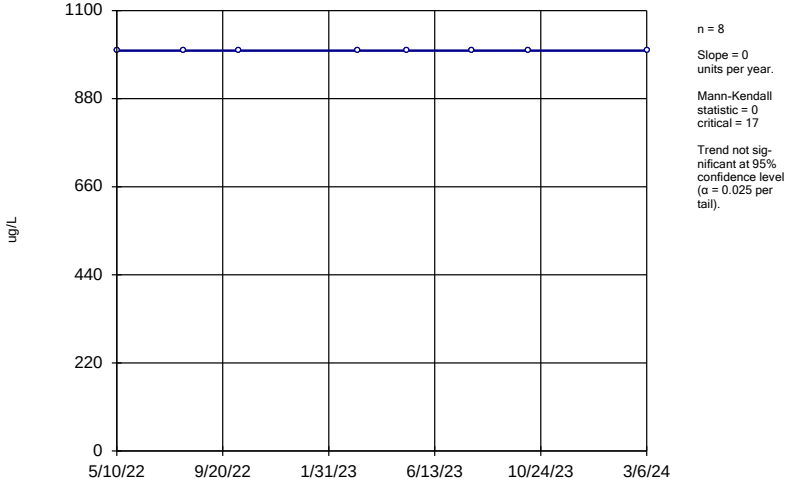
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18005



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

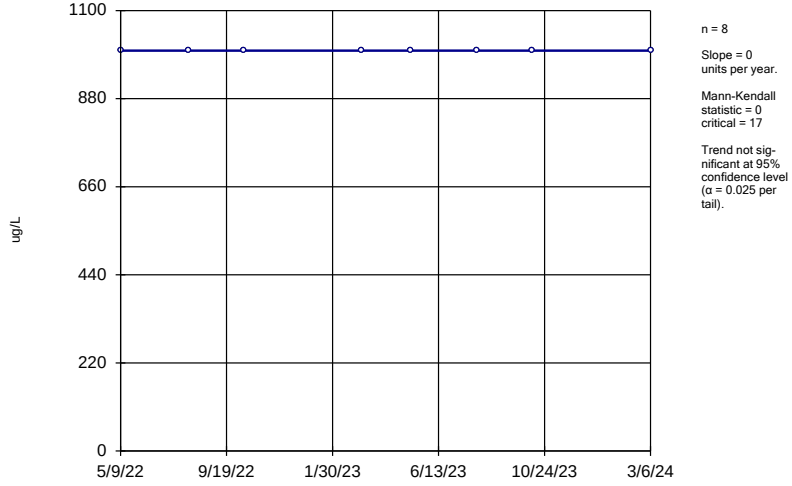
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18006



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

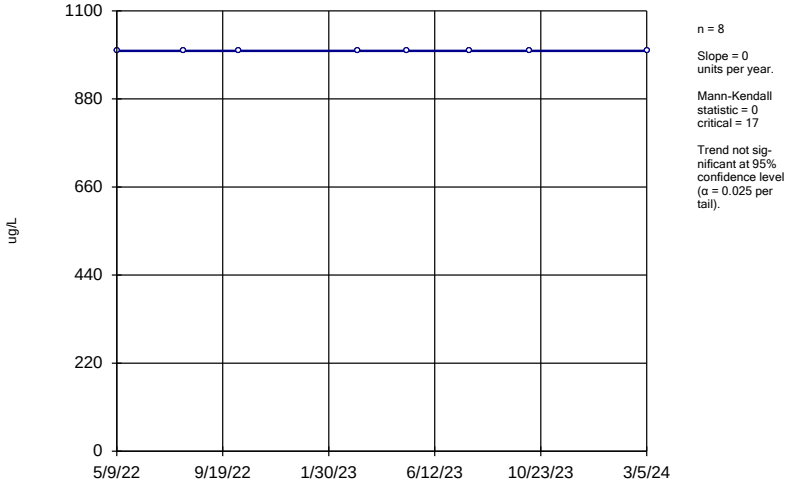
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-50



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

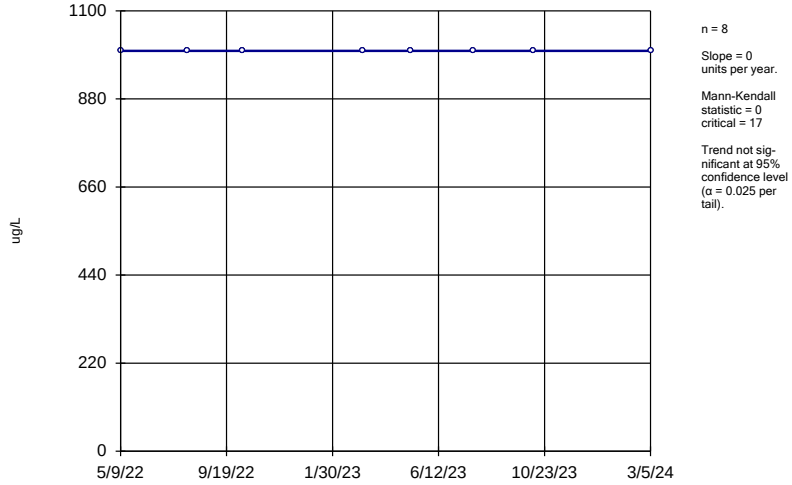
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-51



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

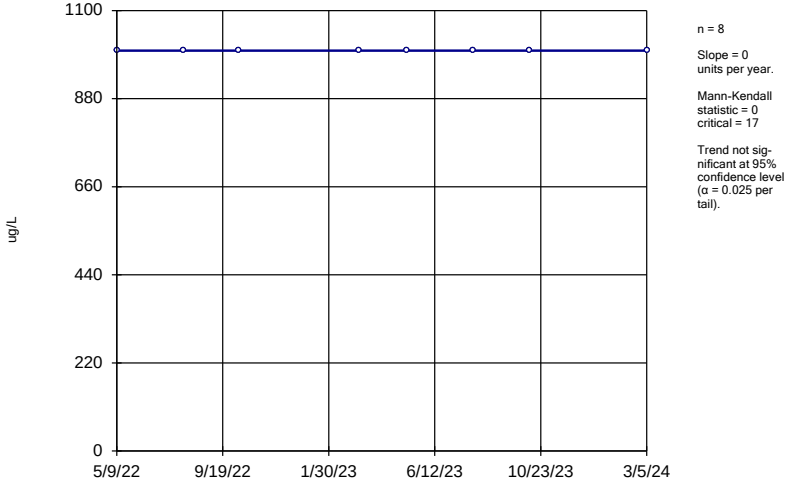
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-52



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

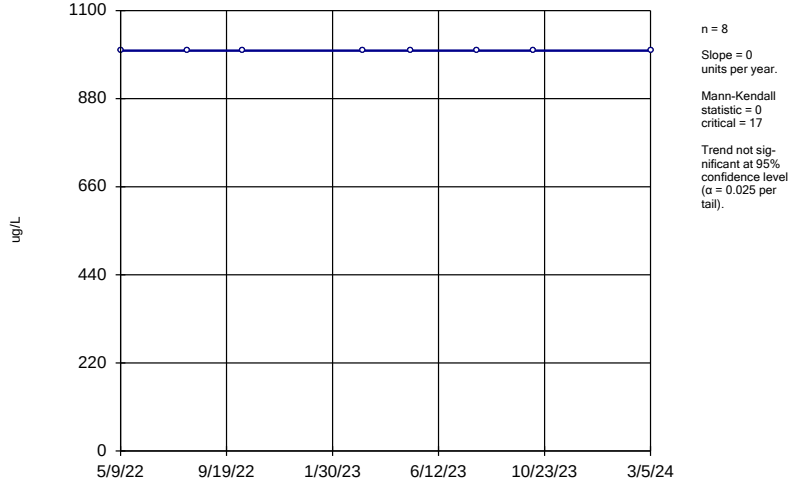
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-53



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

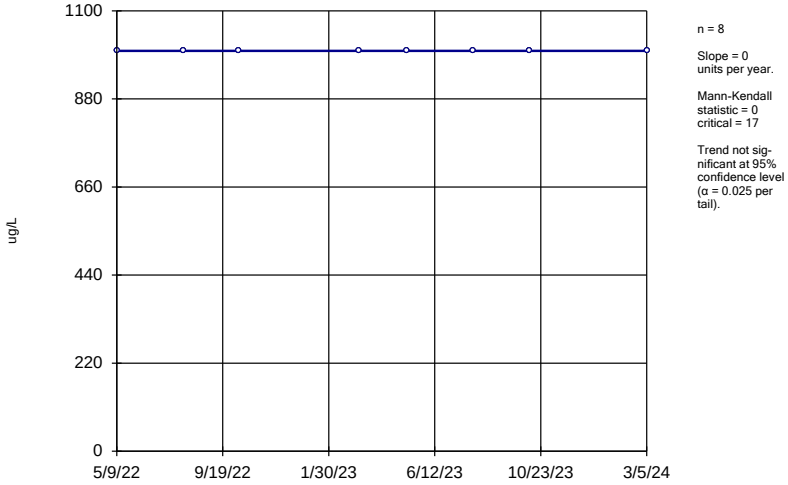
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-53R



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

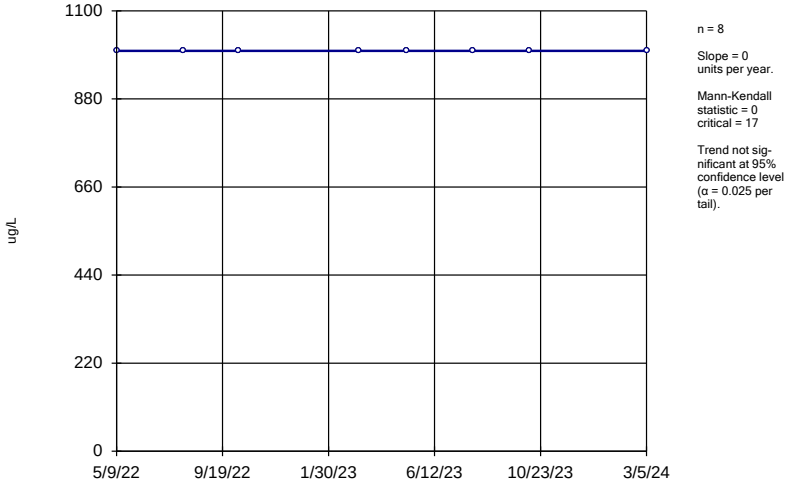
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-54R



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

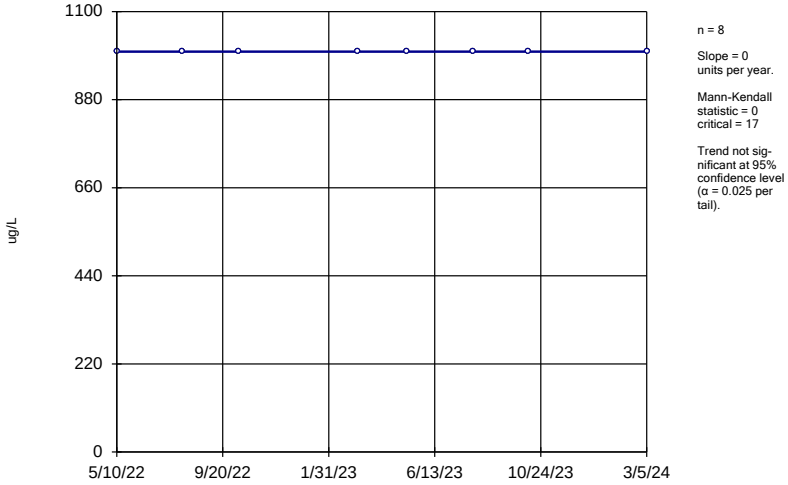
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-55



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

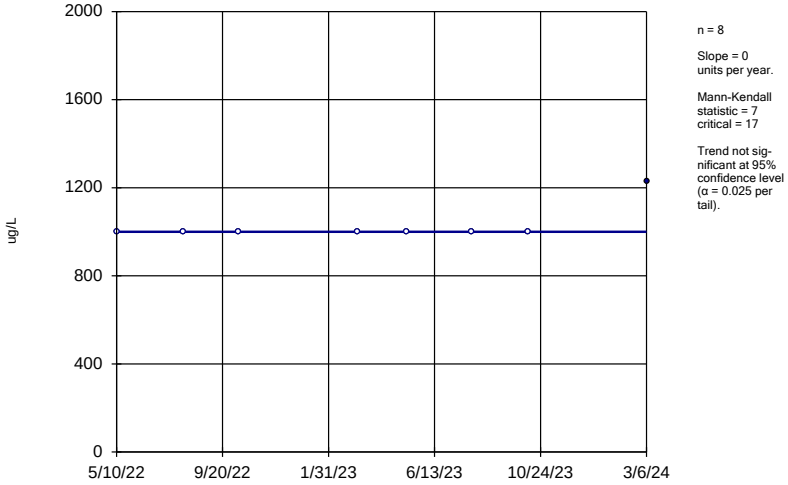
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

OW-57ROUT



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 17

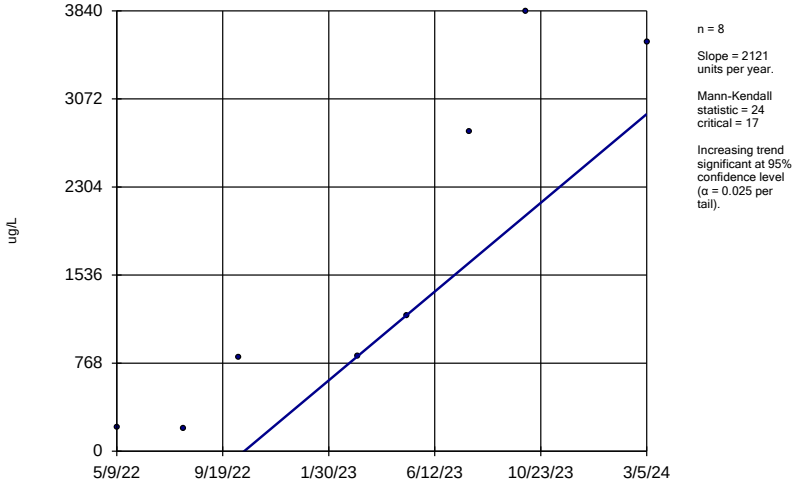
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Iron, Total

JCW-MW-18001



n = 8

Slope = 2121 units per year.

Mann-Kendall statistic = 24 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

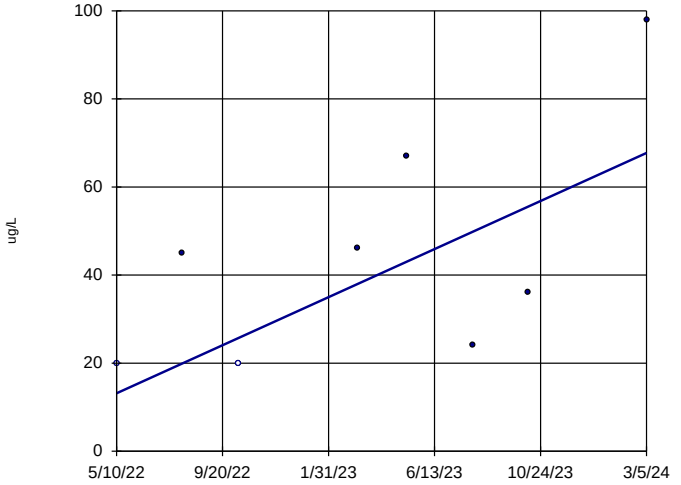
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Hollow symbols indicate censored values.

Iron, Total

JCW-MW-18004



n = 8

Slope = 29.95 units per year.

Mann-Kendall statistic = 13 critical = 17

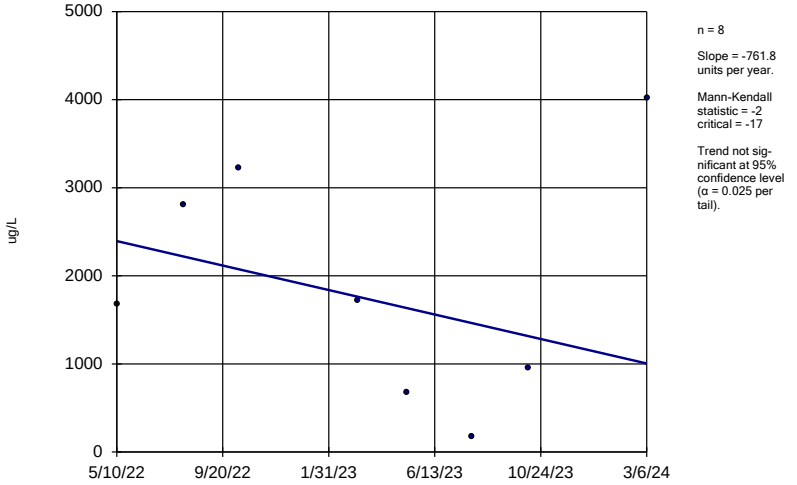
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Iron, Total

JCW-MW-18005



n = 8

Slope = -761.8 units per year.

Mann-Kendall statistic = -2 critical = -17

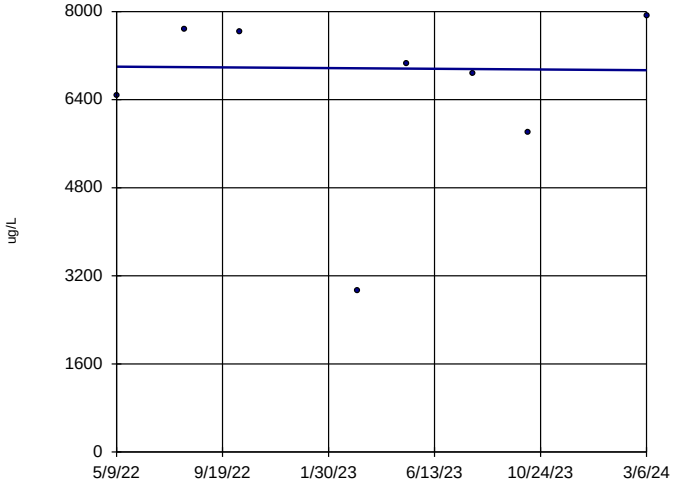
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Iron, Total

JCW-MW-18006



n = 8

Slope = -35.79 units per year.

Mann-Kendall statistic = 0 critical = 17

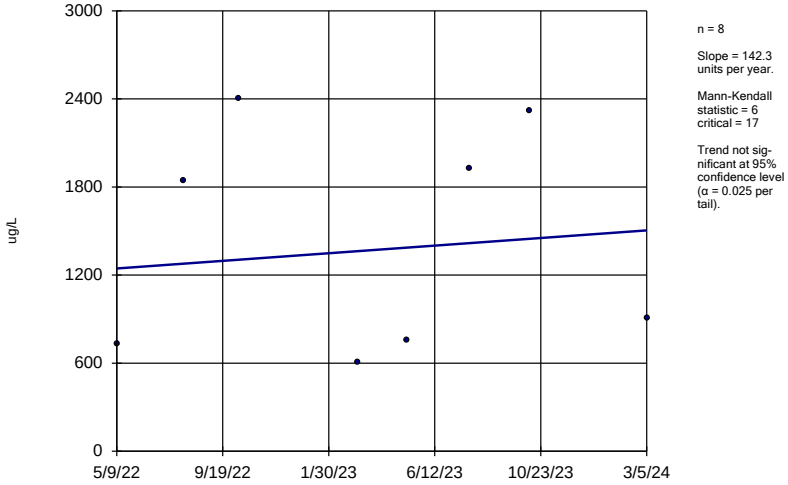
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Iron, Total

MW-50



n = 8

Slope = 142.3 units per year.

Mann-Kendall statistic = 6 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

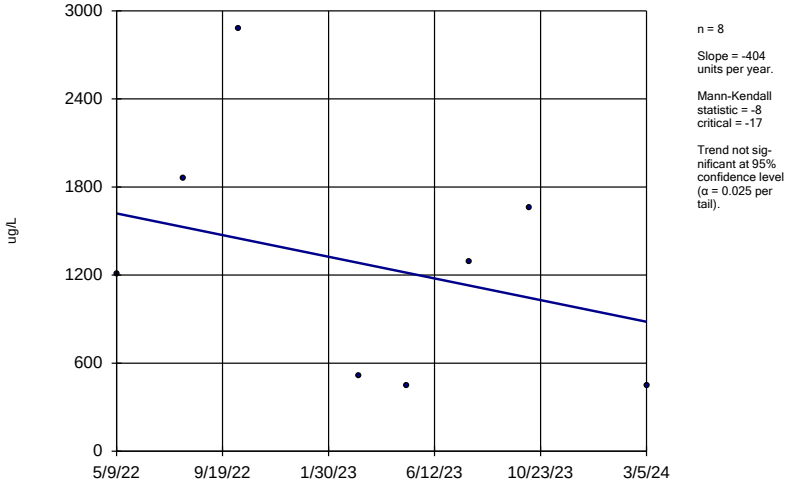
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-51



n = 8

Slope = -404 units per year.

Mann-Kendall statistic = -8 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

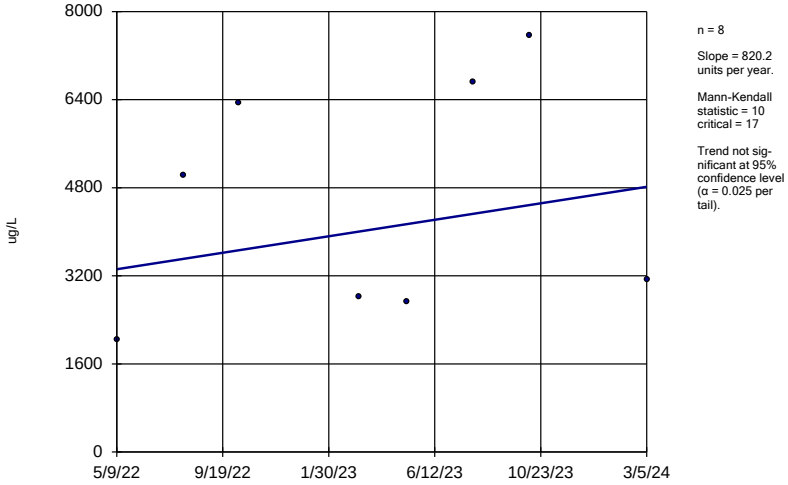
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-52



n = 8

Slope = 820.2 units per year.

Mann-Kendall statistic = 10 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

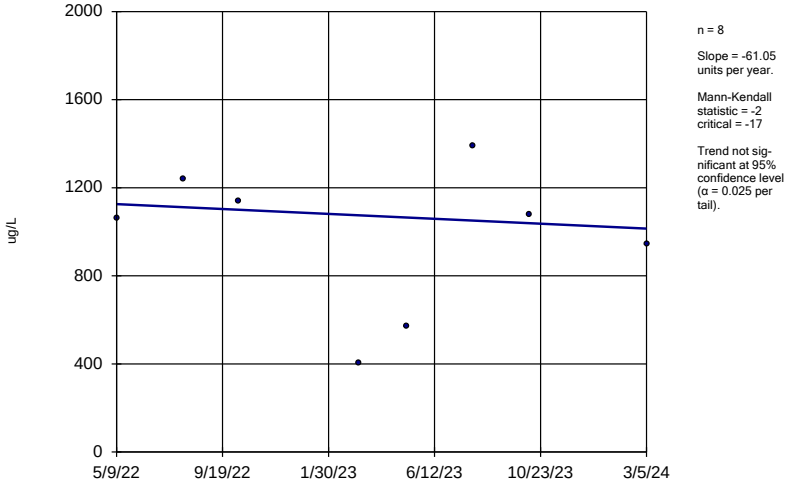
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-53



n = 8

Slope = -61.05 units per year.

Mann-Kendall statistic = -2 critical = -17

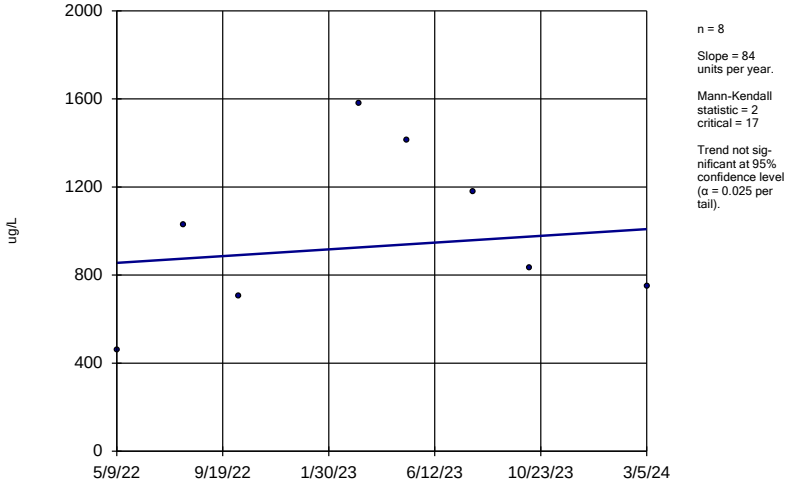
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Iron, Total

MW-53R



n = 8

Slope = 84 units per year.

Mann-Kendall statistic = 2 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

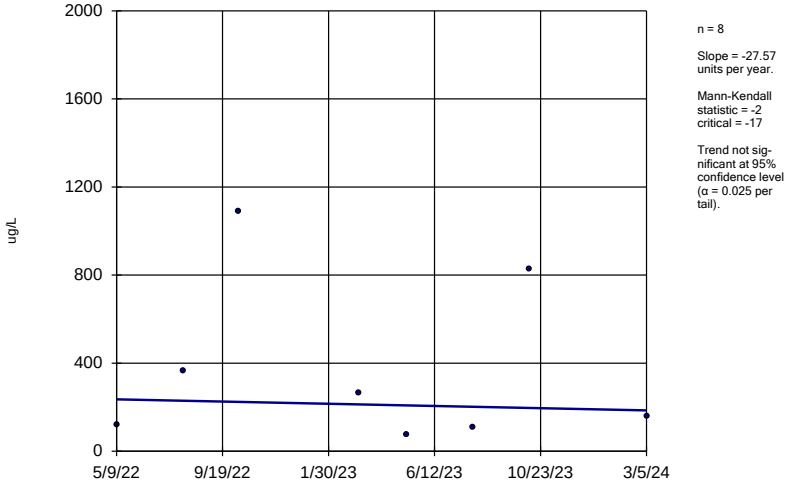
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-54R



n = 8

Slope = -27.57 units per year.

Mann-Kendall statistic = -2 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

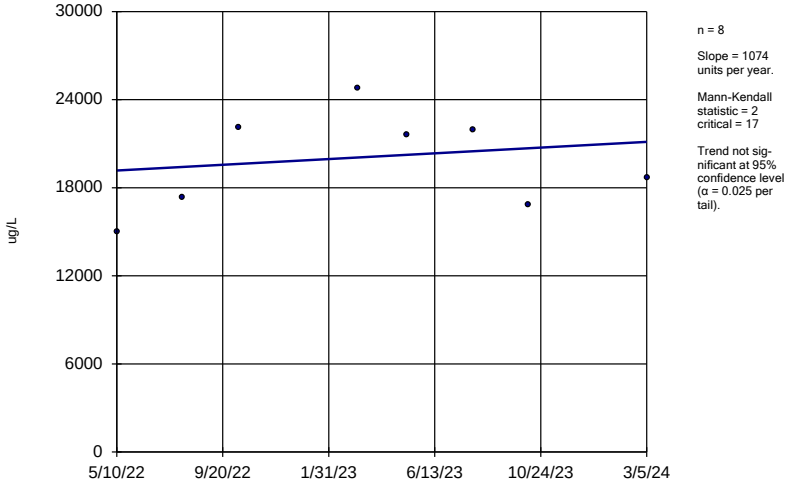
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-55



n = 8

Slope = 1074 units per year.

Mann-Kendall statistic = 2 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

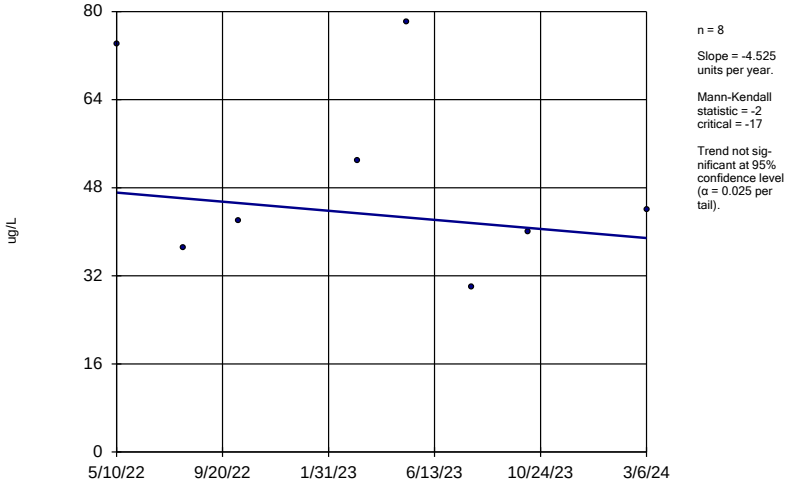
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

OW-57ROUT



n = 8

Slope = -4.525 units per year.

Mann-Kendall statistic = -2 critical = -17

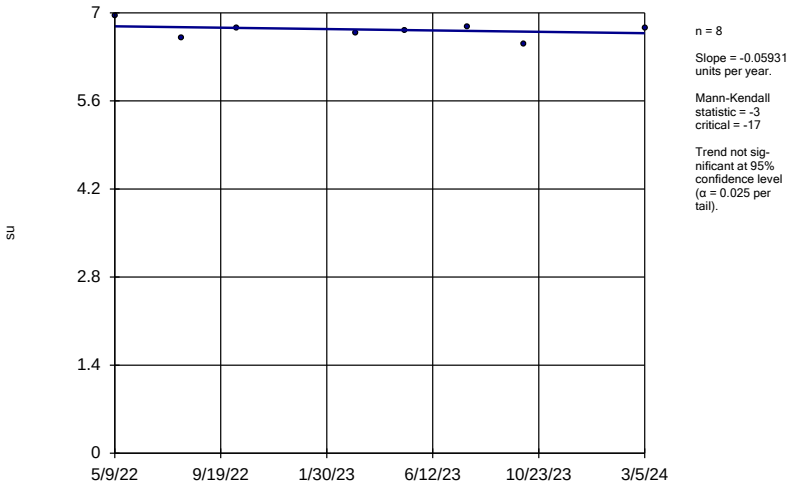
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

pH, Field

JCW-MW-18001



n = 8

Slope = -0.05931 units per year.

Mann-Kendall statistic = -3
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

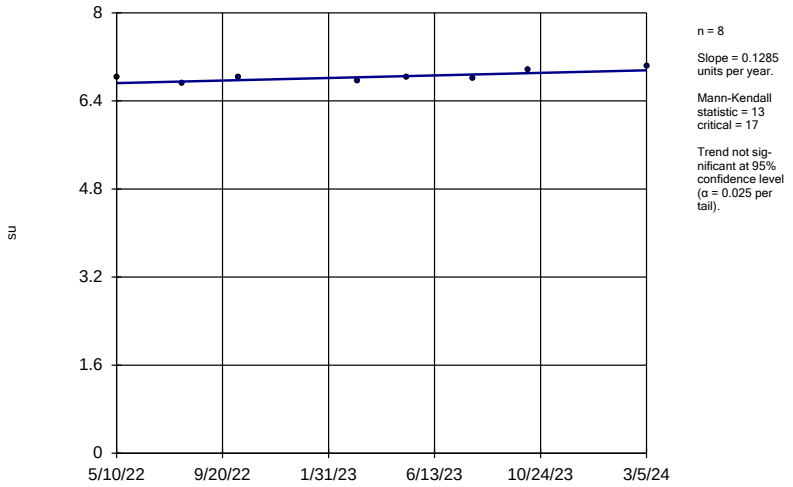
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

JCW-MW-18004



n = 8

Slope = 0.1285 units per year.

Mann-Kendall statistic = 13
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

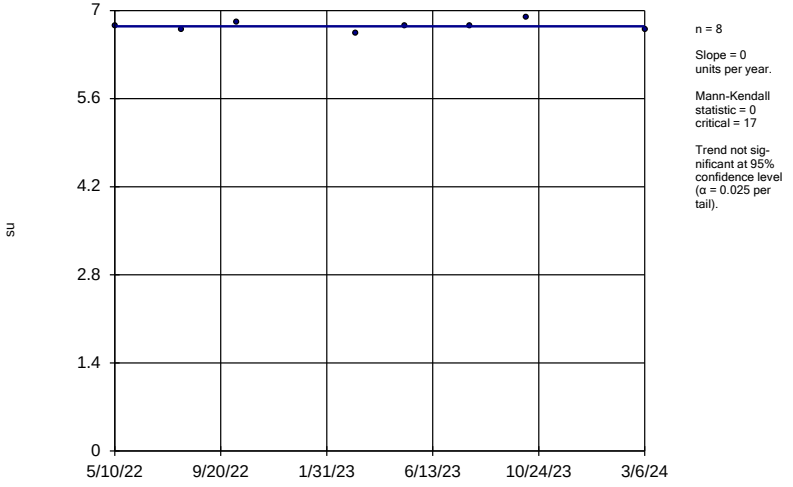
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

JCW-MW-18005



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

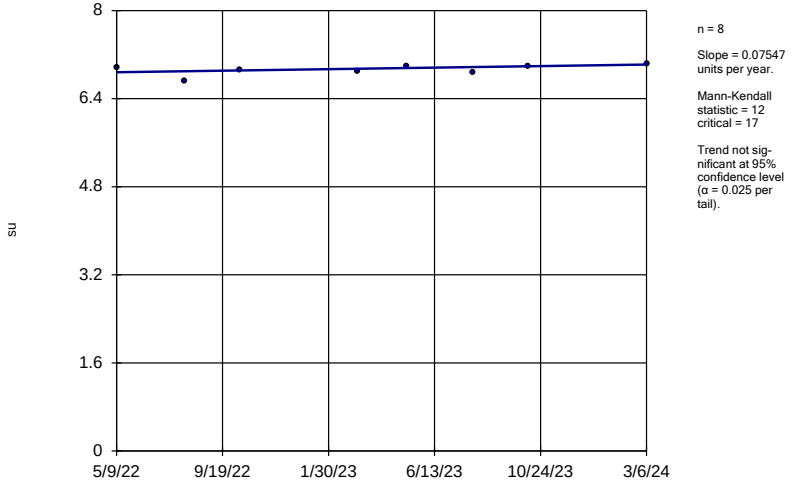
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

JCW-MW-18006



n = 8

Slope = 0.07547 units per year.

Mann-Kendall statistic = 12
critical = 17

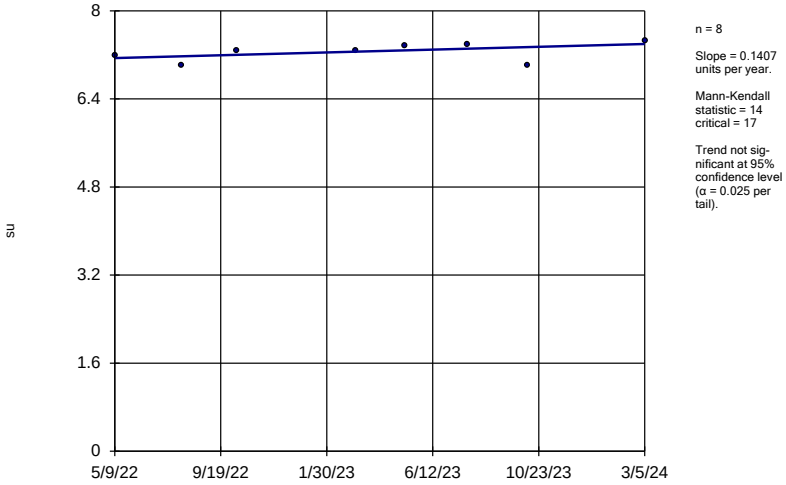
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

pH, Field

MW-50



n = 8

Slope = 0.1407 units per year.

Mann-Kendall statistic = 14 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

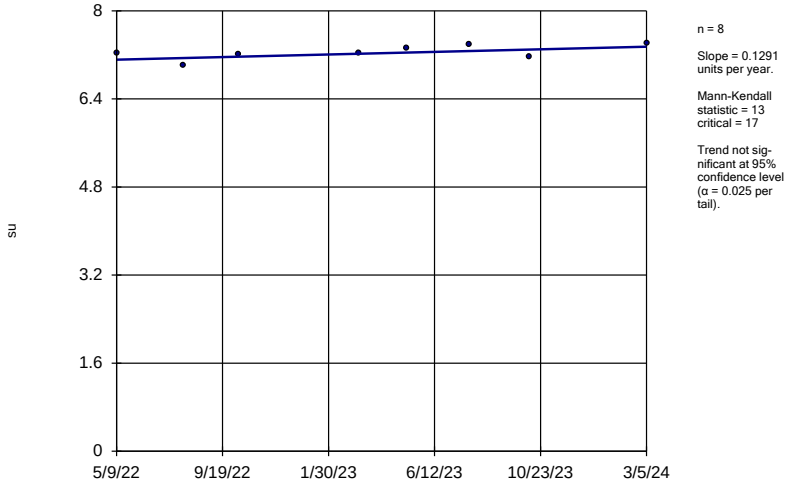
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-51



n = 8

Slope = 0.1291 units per year.

Mann-Kendall statistic = 13 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

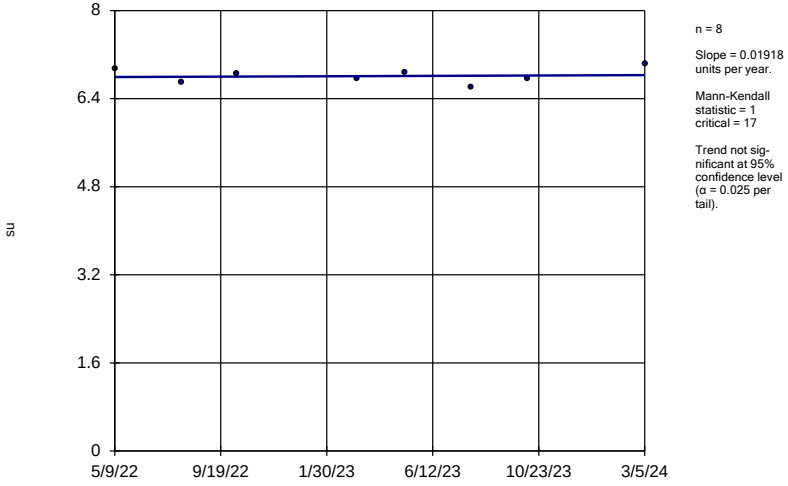
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-52



n = 8

Slope = 0.01918 units per year.

Mann-Kendall statistic = 1 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

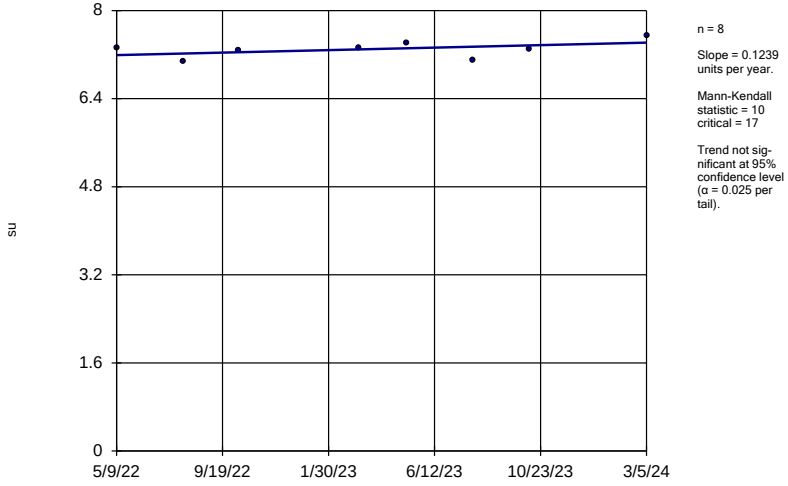
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-53



n = 8

Slope = 0.1239 units per year.

Mann-Kendall statistic = 10 critical = 17

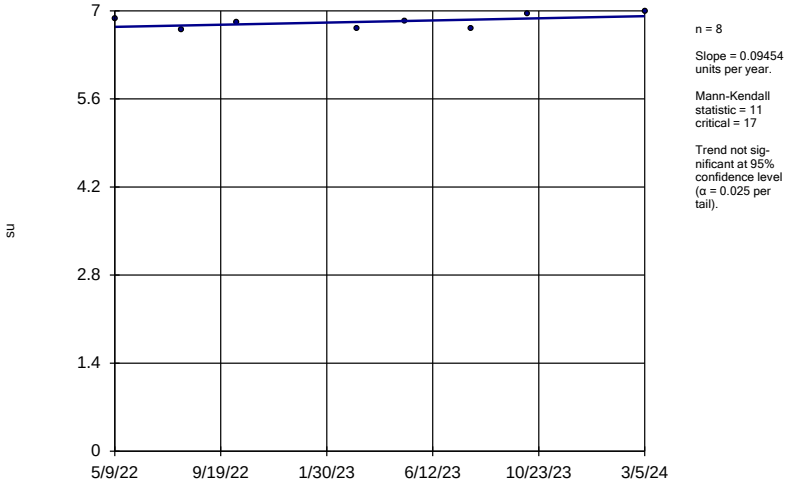
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

pH, Field

MW-53R



n = 8

Slope = 0.09454 units per year.

Mann-Kendall statistic = 11 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

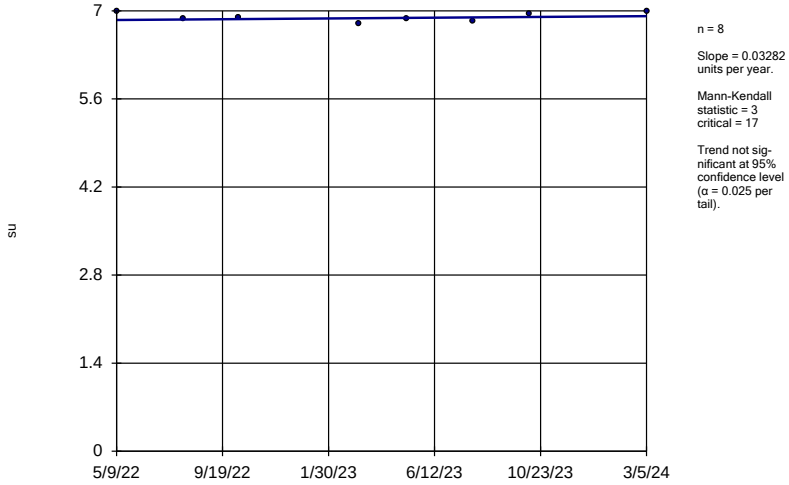
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-54R



n = 8

Slope = 0.03282 units per year.

Mann-Kendall statistic = 3 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

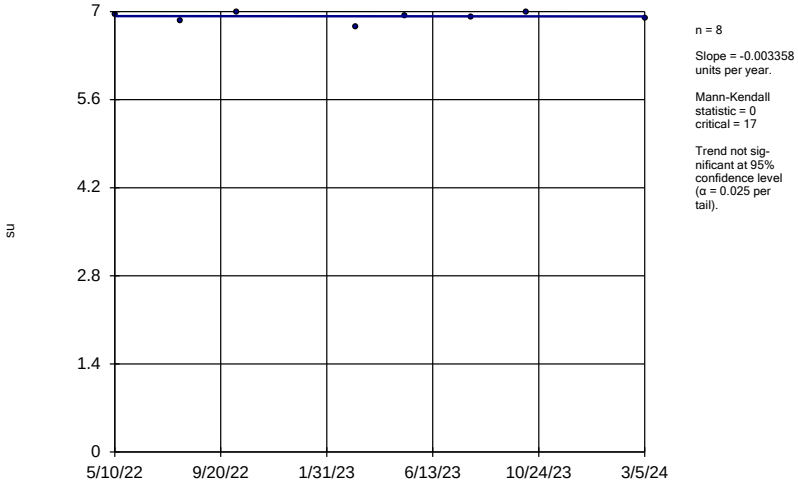
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-55



n = 8

Slope = -0.003358 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

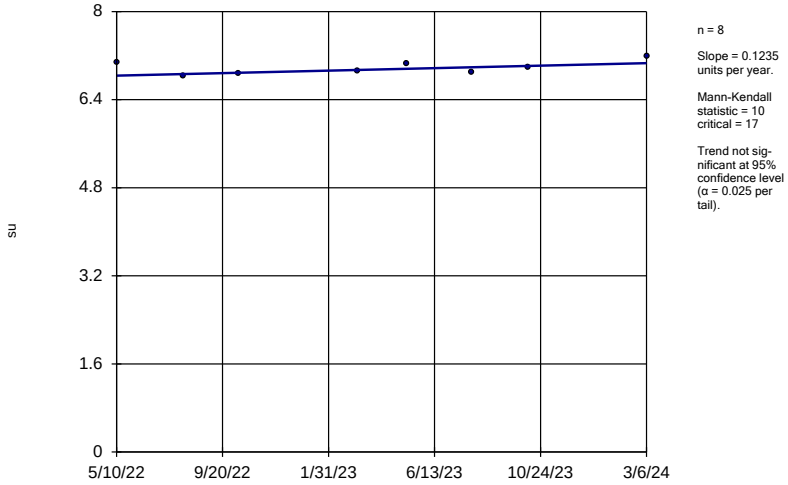
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

OW-57ROUT



n = 8

Slope = 0.1235 units per year.

Mann-Kendall statistic = 10 critical = 17

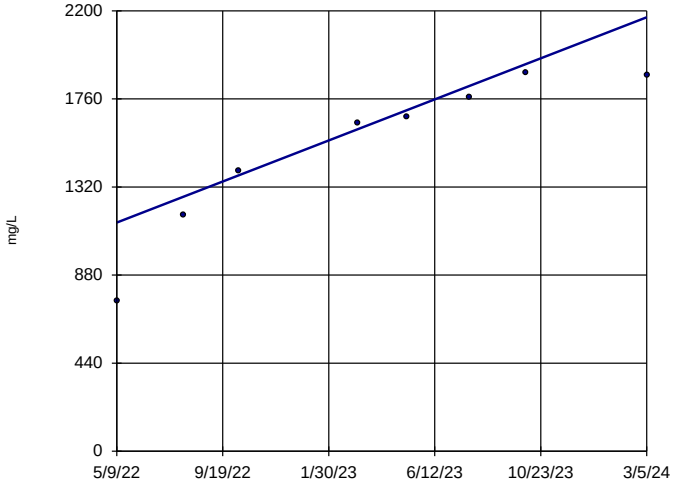
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sulfate

JCW-MW-18001



n = 8

Slope = 561.6 units per year.

Mann-Kendall statistic = 26
critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

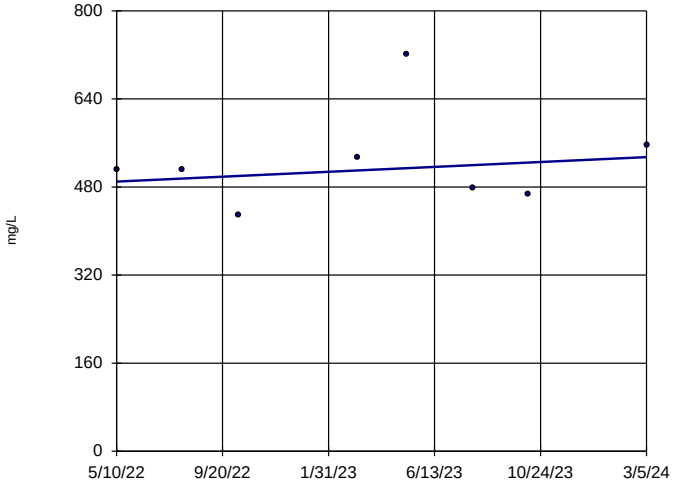
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

JCW-MW-18004



n = 8

Slope = 24.45 units per year.

Mann-Kendall statistic = 3
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

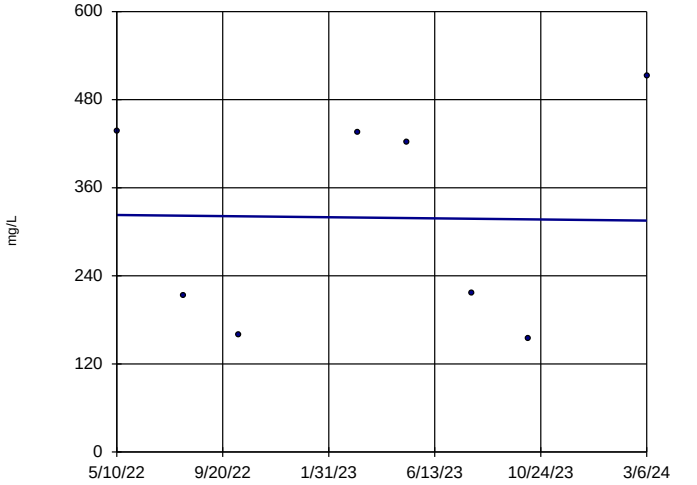
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

JCW-MW-18005



n = 8

Slope = -4.221 units per year.

Mann-Kendall statistic = -2
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

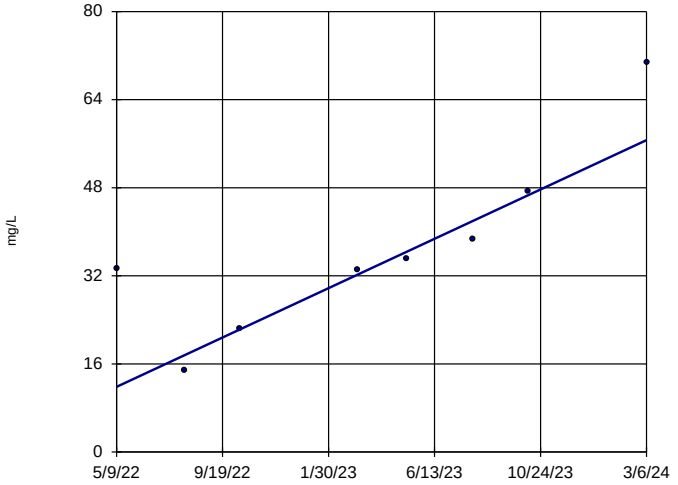
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

JCW-MW-18006



n = 8

Slope = 24.53 units per year.

Mann-Kendall statistic = 22
critical = 17

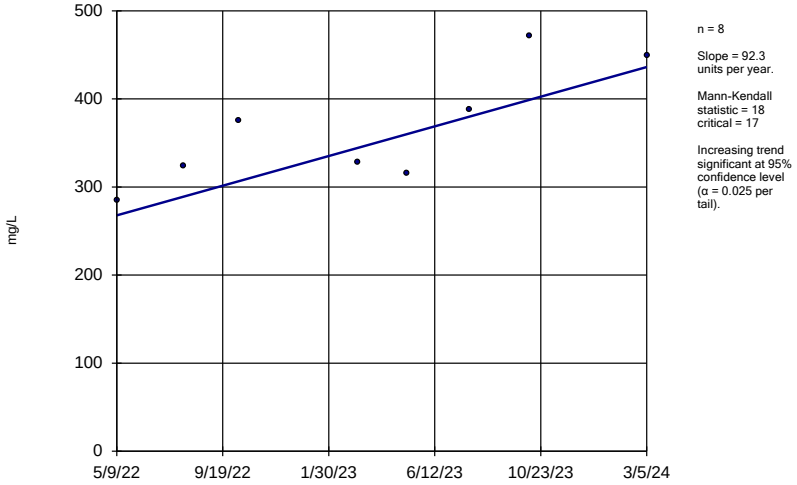
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sulfate

MW-50



n = 8

Slope = 92.3 units per year.

Mann-Kendall statistic = 18 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

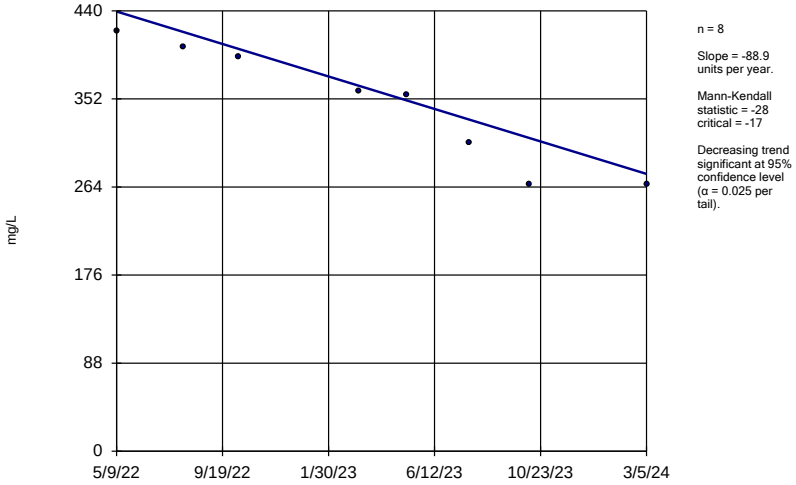
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-51



n = 8

Slope = -88.9 units per year.

Mann-Kendall statistic = -28 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

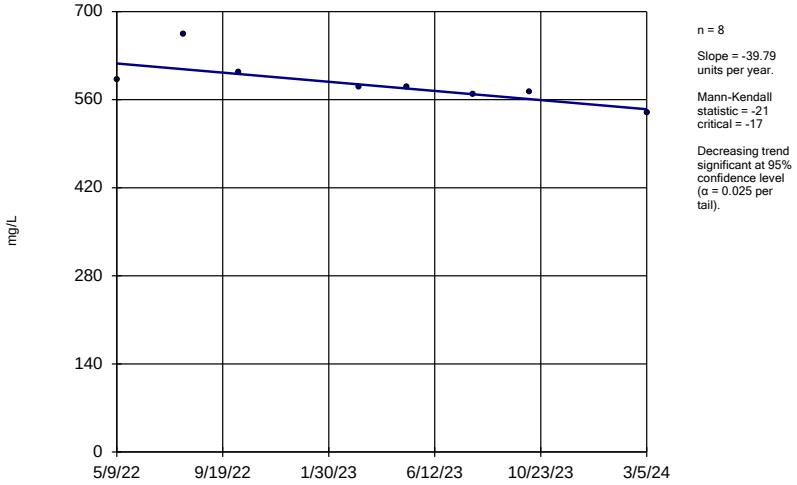
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-52



n = 8

Slope = -39.79 units per year.

Mann-Kendall statistic = -21 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

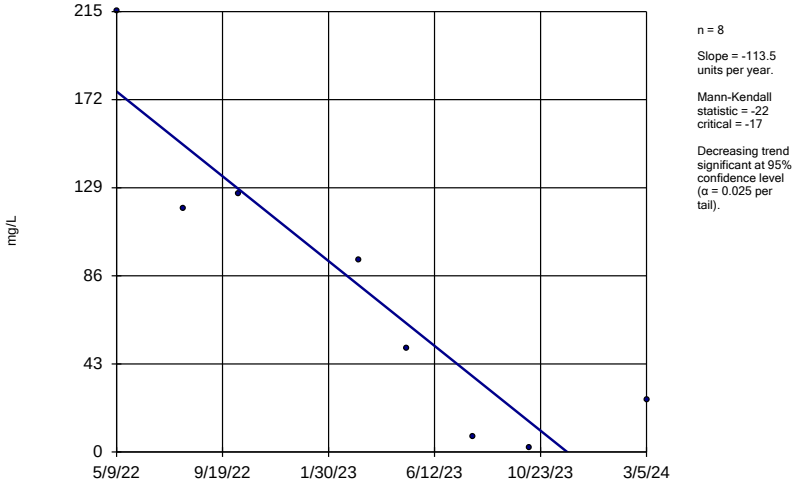
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-53



n = 8

Slope = -113.5 units per year.

Mann-Kendall statistic = -22 critical = -17

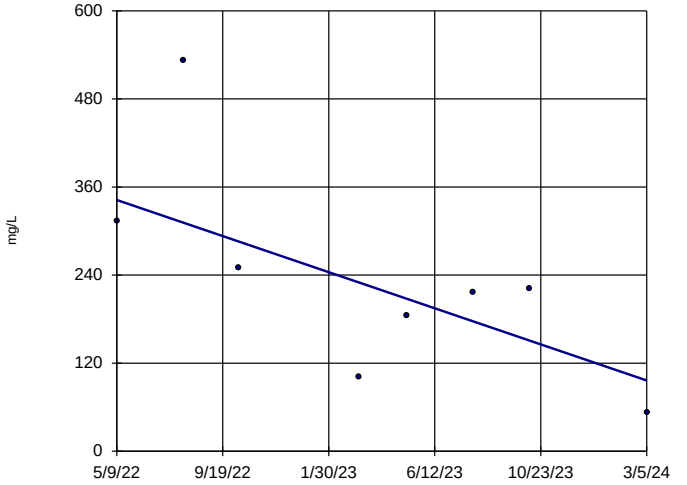
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sulfate

MW-53R



n = 8

Slope = -134.8 units per year.

Mann-Kendall statistic = -14 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

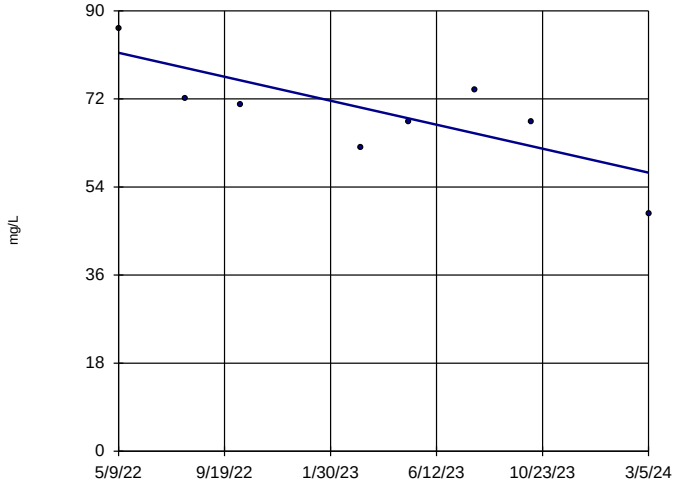
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-54R



n = 8

Slope = -13.41 units per year.

Mann-Kendall statistic = -14 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

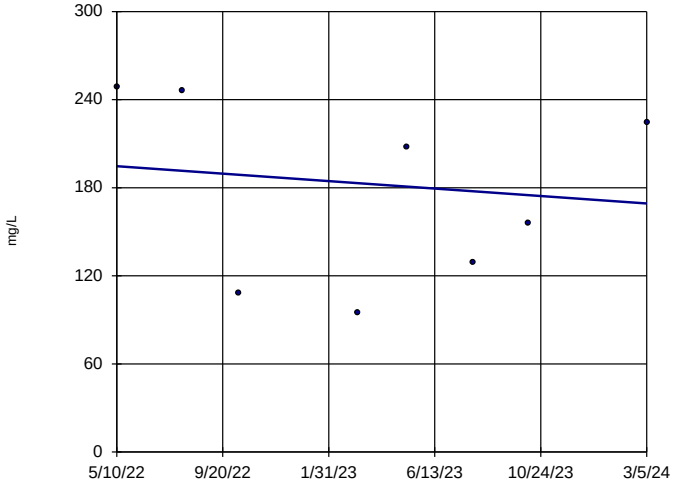
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-55



n = 8

Slope = -13.92 units per year.

Mann-Kendall statistic = -4 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

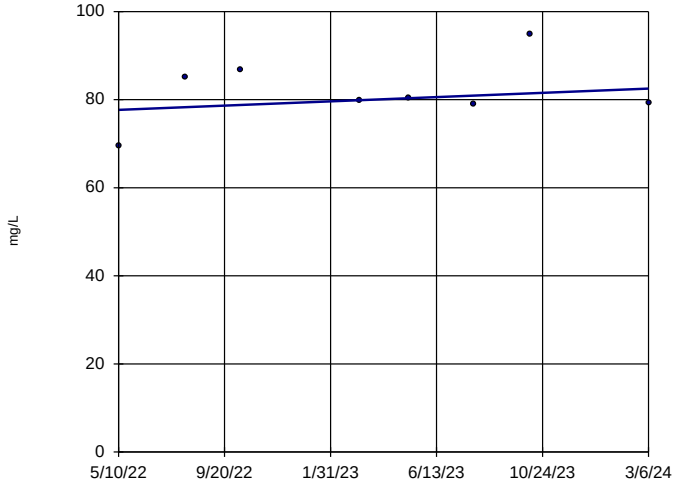
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

OW-57ROUT



n = 8

Slope = 2.643 units per year.

Mann-Kendall statistic = 2 critical = 17

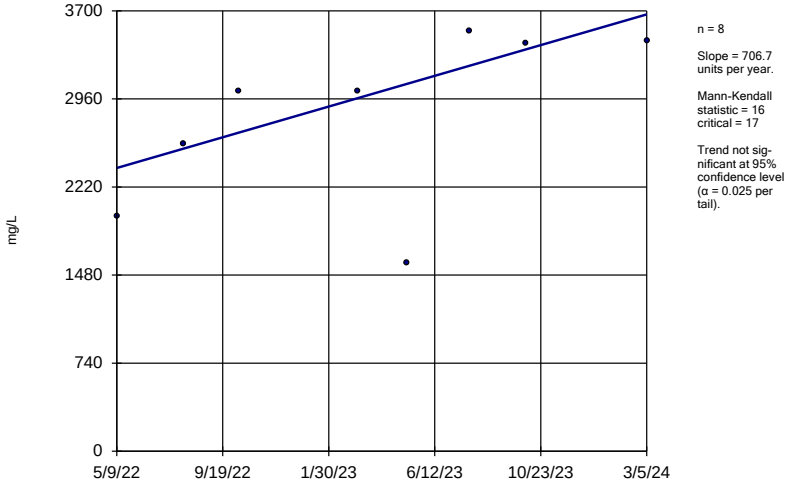
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Total Dissolved Solids

JCW-MW-18001



n = 8

Slope = 706.7 units per year.

Mann-Kendall statistic = 16 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

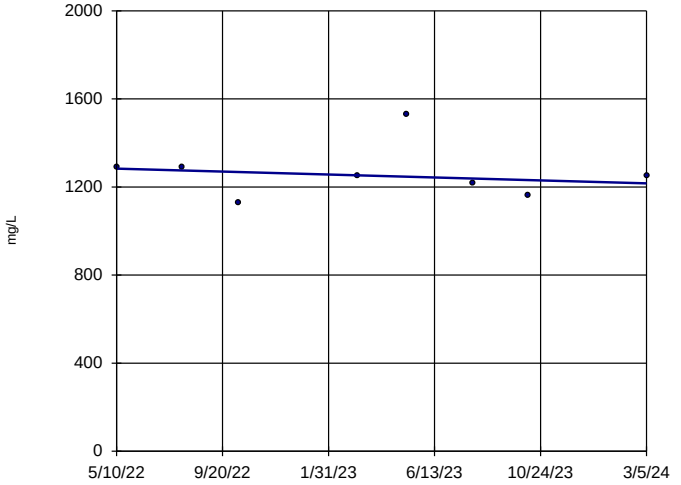
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

JCW-MW-18004



n = 8

Slope = -36.64 units per year.

Mann-Kendall statistic = -6 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

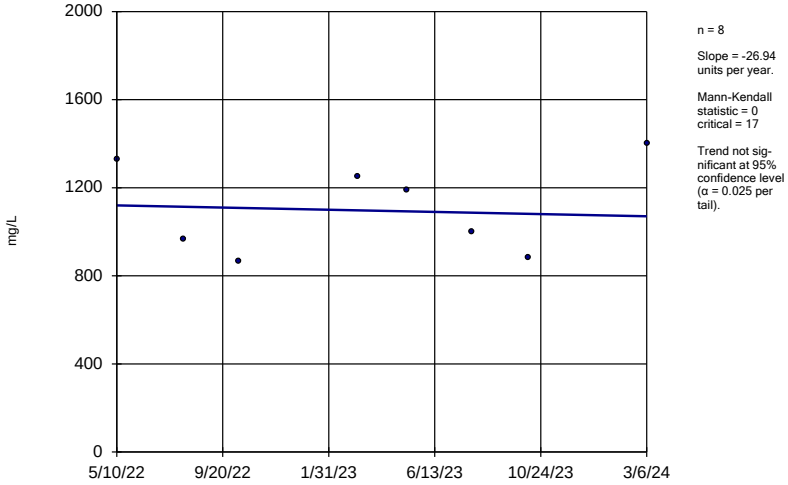
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

JCW-MW-18005



n = 8

Slope = -26.94 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

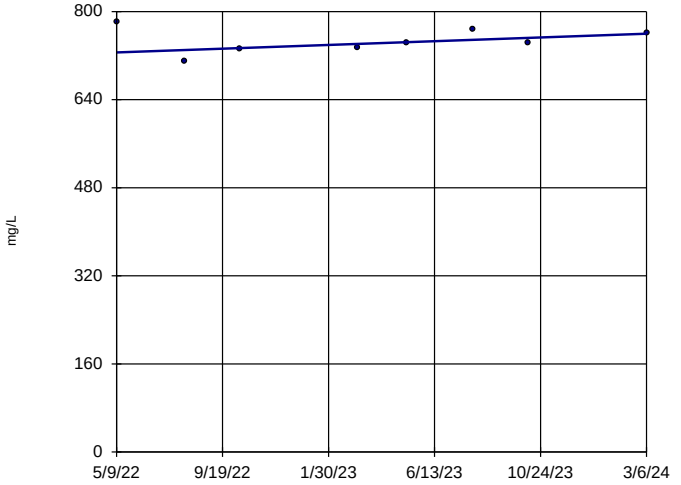
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

JCW-MW-18006



n = 8

Slope = 18.59 units per year.

Mann-Kendall statistic = 10 critical = 17

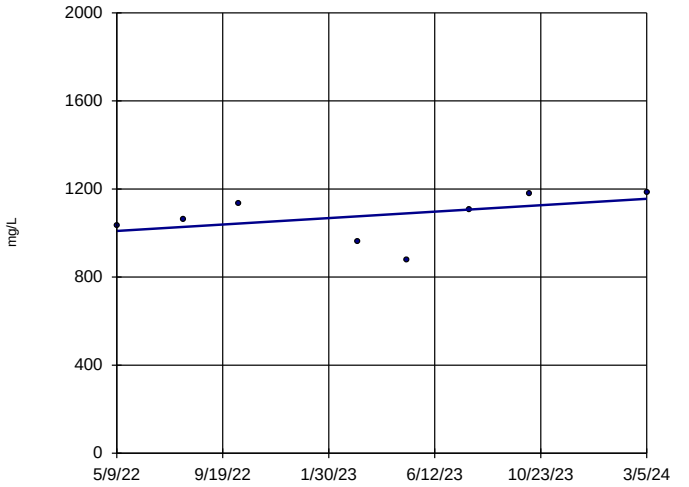
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Total Dissolved Solids

MW-50



n = 8

Slope = 80.3 units per year.

Mann-Kendall statistic = 12 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

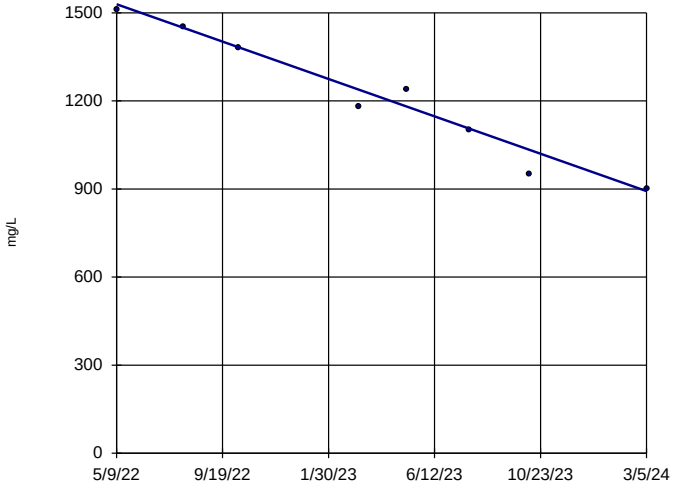
Sen's Slope Estimator Analysis Run 4/7/2024 3:38 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-51



n = 8

Slope = -348.7 units per year.

Mann-Kendall statistic = -26 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

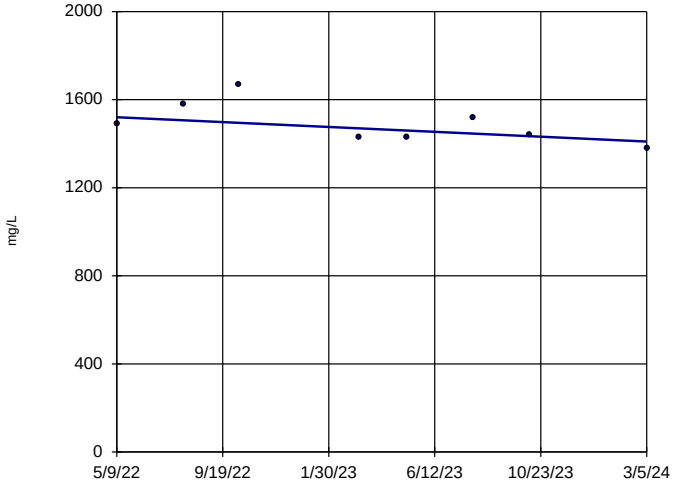
Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-52



n = 8

Slope = -60.36 units per year.

Mann-Kendall statistic = -11 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

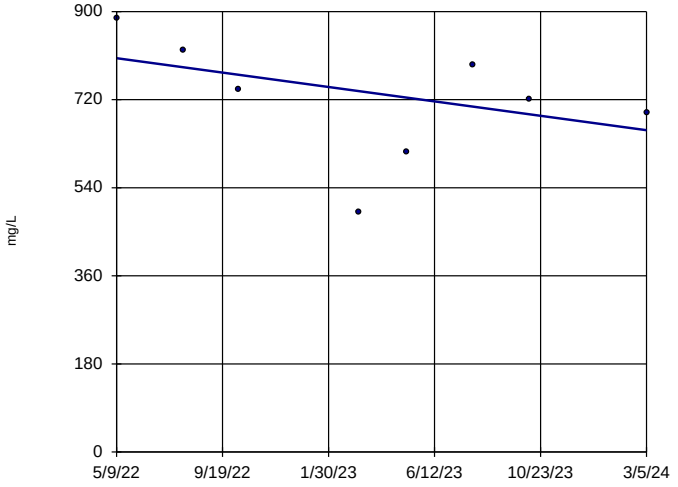
Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-53



n = 8

Slope = -80.72 units per year.

Mann-Kendall statistic = -12 critical = -17

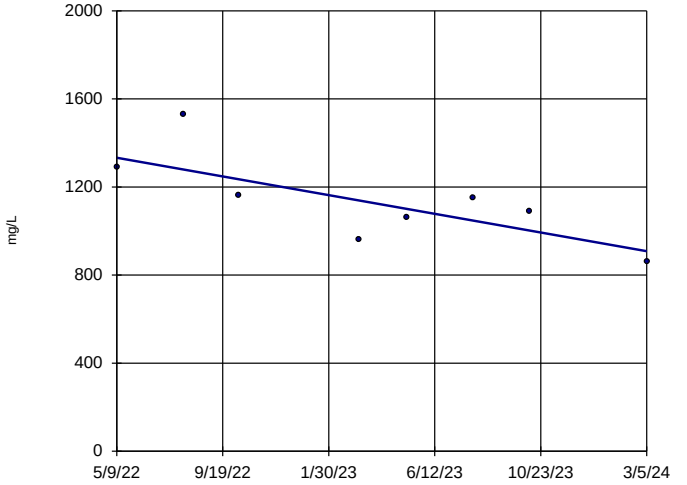
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Total Dissolved Solids

MW-53R



n = 8

Slope = -232.6 units per year.

Mann-Kendall statistic = -16
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

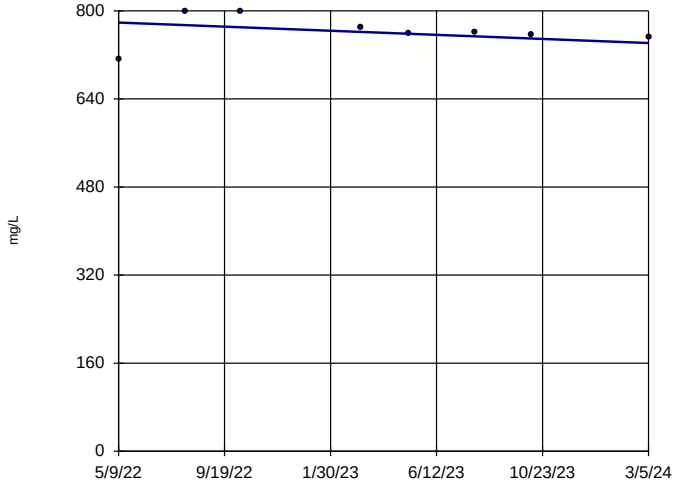
Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-54R



n = 8

Slope = -20.48 units per year.

Mann-Kendall statistic = -12
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

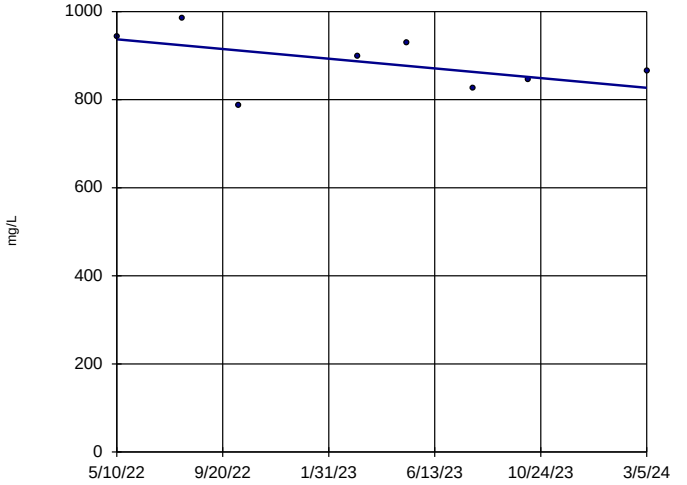
Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-55



n = 8

Slope = -60.39 units per year.

Mann-Kendall statistic = -8
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

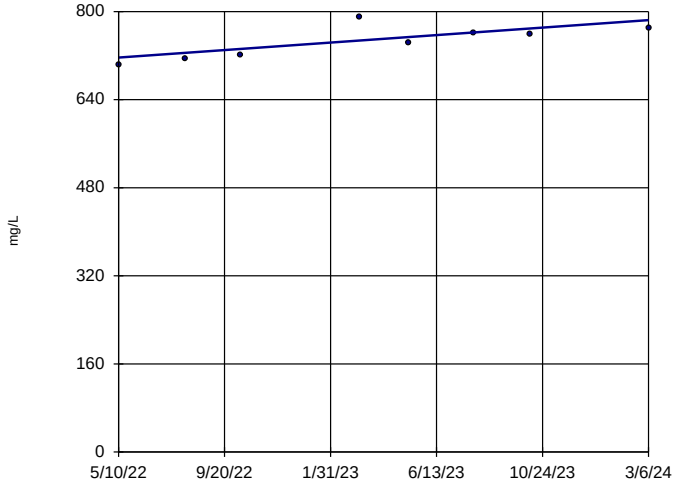
Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

OW-57ROUT



n = 8

Slope = 37.18 units per year.

Mann-Kendall statistic = 18
critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/7/2024 3:39 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Appendix D
Assessment Monitoring and GSI Statistical Evaluation

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Technical Memorandum

Date:	April 30, 2024
To:	J.R. Register, Consumers Energy
From:	Darby Litz, TRC Rebecca Paalanen, TRC
Project No.:	553828.0000 Phase 002, Task 002
Subject:	Assessment Monitoring and GSI Statistical Evaluation of the First Quarter 2024 Sampling Event JC Weadock Landfill, Consumers Energy Company, Essexville, Michigan

During the statistical evaluation of the initial assessment monitoring event (May 2018), arsenic was present in one or more downgradient monitoring wells at statistically significant levels exceeding the Groundwater Protection Standards (GWPSs). Therefore, Consumers Energy Company (Consumers Energy) initiated an Assessment of Corrective Measures (ACM) within 90 days from when the Appendix IV exceedance was determined. The ACM was completed on September 11, 2019.

Currently, Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule[1] at the JC Weadock Power Plant Landfill and quarterly groundwater monitoring in accordance with the February 2021 Weadock Landfill Hydrogeological Monitoring Plan (HMP). The first quarter 2024 monitoring event was conducted on March 4-7, 2024. In accordance with §257.95 and the HMP, the assessment monitoring data must be compared to GWPSs to determine whether or not Appendix III and Appendix IV constituents, and additional Michigan Part 115 (as amended by PA 640) Section 11511a(3) and Section 11519b(2) constituents, are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h) and Part 115, as detailed in the April 23, 2021 Groundwater Protection Standards technical memorandum, which was also included in the First Quarter 2021 Hydrogeological Monitoring Report[2]. In accordance with the HMP, groundwater monitoring data from the designated groundwater-surface water (GSI) monitoring wells must be also compared to the GSI criteria to determine whether or not the GSI monitoring constituents are detected at statistically significant levels above the GSI criteria.

The evaluation of the initial semiannual assessment monitoring event data (April and May 2018) indicated that arsenic was present at statistically significant levels above the GWPS at one of the three former downgradient wells. The three downgradient wells were located within a vent (e.g., opening) of the perimeter soil/bentonite slurry wall to assess the quality of groundwater passing the waste

[1] USEPA final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) published April 17, 2015, as amended per Phase One, Part One of the CCR Rule (83 FR 36435).

[2] TRC. 2021. *First Quarter 2021 Hydrogeological Monitoring Report – JC Weadock Solid Waste Disposal Area, Essexville, Michigan.* Prepared for Consumers Energy Company. April.

boundary. As discussed in detail in the HMP, in July 2018, the vent in the perimeter soil/bentonite slurry wall was closed and the slurry wall is now continuous along the entire perimeter of the Weadock Landfill. As a result, the groundwater monitoring system was revised, as documented in the HMP. The monitoring well network now consists of twelve (12) downgradient monitoring wells and eight (8) GSI monitoring wells.

The statistical evaluation of the first quarter 2024 assessment monitoring event data indicates that the following constituents are present at statistically significant levels above the GWPSs in downgradient monitoring wells at the Weadock Landfill:

Constituent	GWPS	#Downgradient Wells Exceeded
Boron	560 µg/L	11 of 12
Calcium	280 mg/L	1 of 12
Sulfate	780 mg/L	1 of 12

Corrective action has been triggered as a result of data collected during the initial assessment monitoring event. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97 and execute the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

The statistical evaluation found that no constituents were present at statistically significant levels exceeding the site-specific GSI criteria.

Statistical Evaluation Procedures

Following each quarterly sampling event, compliance well data for the Weadock Landfill are evaluated in accordance with the Assessment Monitoring Statistical Data Evaluation and GSI Data Evaluation procedures in the HMP. The assessment monitoring and GSI monitoring programs were developed to evaluate concentrations of constituents present in the uppermost aquifer relative to acceptable levels (i.e., GWPSs or GSI criteria). To evaluate whether or not a criterion exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given monitoring event compared to the applicable criterion must be large enough, after accounting for variability in the sample data, that the result is unlikely to have occurred merely by chance. Consistent with the Unified Guidance [3], the preferred method for comparisons to a fixed standard is confidence limits. Based on the number of historical observations in the representative sample population, the sample mean, the sample standard deviation, and a selected confidence level (i.e., 99 percent), an upper and lower confidence limit is calculated. The true concentration, with 99 percent confidence, will fall between the lower and upper confidence limits.

The concentrations observed in the downgradient wells are deemed to be a statistically significant exceedance when the 99 percent lower confidence limit of the downgradient data exceeds the criterion. If the confidence interval straddles the criterion (i.e., the lower confidence level is below the criterion, but the upper confidence level is above), the statistical test result indicates that there is insufficient

[3] USEPA. 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Conservation and Recovery. EPA 530/R-09-007.

confidence that the measured concentrations are different from the criterion and thus no compelling evidence that the measured concentration is a result of a release from the CCR unit versus the inherent variability of the sample data. This statistical approach is consistent with the statistical methods for assessment monitoring presented in §257.93(f) and (g). Statistical evaluation methodologies built into the CCR Rule and Part 115 and numerous other federal rules are key in determining whether or not individually measured data points represent a concentration increase over the baseline or a fixed standard (such as a GWPS in an assessment monitoring program).

For each detected constituent, the concentrations for each well were first compared directly to the GWPS, as shown on Table 1, or the GSI criteria, as shown on Table 2. Parameter-well combinations that included a direct exceedance of the criteria within the most recent two years of sampling events (eight quarterly sampling events, May 2022 through March 2024) were retained for further analysis.

Groundwater data were evaluated utilizing Sanitas™ statistical software. Sanitas™ is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas™ statistical program, confidence limits were used to perform the statistical comparison of compliance data to a fixed standard. Parametric and non-parametric confidence intervals were calculated for each parameter with a direct exceedance using a per test[4] 99 percent confidence level, i.e., a significance level (α) of 0.01. The following narrative describes the methods employed, the results obtained and the Sanitas™ output files are included as an attachment.

The statistical data evaluation included the following steps:

- Review of data quality checklists for the data sets;
- Graphical representation of the monitoring data as time versus concentration by well/constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of visual trends apparent in the graphical representations for statistical significance;
- Evaluation of percentage of non-detects for each well-constituent pair;
- Distribution of the data; and
- Calculation of the confidence intervals for each cumulative dataset.

The results of these evaluations are presented and discussed below.

Data from each round were evaluated for completeness, overall quality, and usability and were deemed appropriate for the purposes of the assessment and GSI monitoring programs. Initially, the results were observed visually for potential outliers. No outliers were identified in the data set.

The Sanitas™ software was then used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent eight sampling events. The tests were run with a per-test significance of $\alpha = 0.01$. Non-detect data was handled in accordance with the HMP for the purposes of calculating the confidence intervals.

[4] Confidence level is assessed for each individual comparison (i.e., per well and per constituent).

The Sanitas™ software generates an output that includes graphs of the parametric or non-parametric confidence intervals for each well along with notes data transformations, as appropriate.

Assessment Monitoring Statistical Evaluation

The assessment monitoring statistical evaluation is performed on the downgradient monitoring wells in accordance with the HMP. The downgradient monitoring wells include:

- JCW-MW-18001
- JCW-MW-18004
- JCW-MW-18005
- JCW-MW-18006
- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- OW-57R Out

The concentrations from each well were first compared directly to the GWPS, as shown on Table 1. Constituent-well combinations that included a direct exceedance of the GWPS within the past eight monitoring events were retained for further analysis (Attachment 1). Direct comparison GWPS exceedances include the following constituent well combinations:

- Boron in MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, MW-55, OW-57R OUT, JCW-MW-18001, JCW-MW-18005, and JCW-MW-18006;
- Calcium in JCW-MW-18001 and JCW-MW-18005;
- Sulfate in JCW-MW-18001;
- Arsenic in MW-55 and JCW-MW-18006; and
- Molybdenum in MW-55.

The purpose of assessment monitoring is to assess whether constituent concentrations in groundwater from prior operations are above a risk-based standard (i.e. GWPS). As detailed in the *Alternate Source Demonstration* (TRC, December 2019), the arsenic and molybdenum concentrations at MW-55 are not the result of a release from the unit; therefore, comparison of these concentrations to the GWPS is not appropriate and assessment monitoring confidence intervals were not calculated.

The software outputs for the assessment monitoring data evaluation are included in Attachment 1 along with data reports showing the values used for the evaluation. The percentage of non-detect observations are also included in Attachment 1. Visual trends were apparent in multiple wells for arsenic, boron, calcium, and sulfate. These data sets were tested further in Sanitas™ utilizing Sen's Slope to estimate the average rate of change in concentration over time and utilizing the Mann-Kendall trend test to test for significance of the trend at the 98% confidence level. The trend tests show that the trends for boron at MW-51, calcium at JCW-MW-18001, and sulfate at JCW-MW-18001 are statistically significant (Attachment 1). The trends are causing the confidence intervals to widen. Calculating a confidence interval around a trending data set incorporates not only variability present naturally in the underlying dataset, but also incorporates variability due to the trend itself. Based on the observed trends, confidence bands were selected as a more appropriate assessment for boron at MW-51, calcium at JCW-MW-18001, and sulfate at JCW-MW-18001. Confidence bands are selected by the Unified Guidance as the appropriate method for calculating confidence intervals on trending data. A confidence band calculates upper and lower confidence limits at each point along the trend to reduce variability and create a narrower confidence interval.

The Sanitas™ software generates an output that includes graphs of the confidence bands and parametric or non-parametric confidence intervals for each well along with notes on data transformations, as appropriate. The data distributions are as follows:

Distribution	Constituent-Well Combinations
Normal	Boron at JCW-MW-18001, JCW-MW-18006, MW-50, MW-52, MW-53, MW-54R, MW-55, and OW-57R OUT Calcium at JCW-MW-18005
Normalized by power transformation	Boron at MW-53R (squared) Arsenic at JCW-MW-18006 (squared)
Normalized by natural log transformation	Boron at JCW-MW-18005
Not Applicable – confidence bands used	Boron at MW-51 Calcium at JCW-MW-18001 Sulfate at JCW-MW-18001

The confidence bands and interval tests compare the lower confidence limit to the GWPS. Arsenic concentrations at JCW-MW-18006 were previously considered statistically significant; however, the lower confidence limit has been at or below the GWPS since the second quarter 2021. Calcium concentrations at MW-51 were previously considered statistically significant; however, calcium concentrations are generally decreasing, the lower confidence limit has been below the GWPS since the first quarter 2022, and concentrations have been below the GWPS by direct comparison since first quarter 2022. Concentration trends will continue to be monitored. Statistically significant exceedances of the GWPS were noted for boron at JCW-MW-18001, JCW-MW-18005, JCW-MW-18006, MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, MW-55, and OW-57R OUT, calcium at JCW-MW-18001, and sulfate at JCW-MW-18001. Boron concentrations have been consistently above the GWPS since monitoring under the Weadock Landfill HMP began in first quarter 2021. Calcium at JCW-MW-18001 was a confirmed GWPS exceedance in first quarter 2023 resulting from increases in calcium concentration since first quarter 2021. Sulfate at JCW-MW-18001 was a confirmed GWPS exceedance in second quarter 2023 resulting from increases in sulfate concentrations. As noted in the Alternate Source Demonstration (Fourth Quarter 2023 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, January 2024), multiple lines of evidence indicate that the increase in sulfate concentration is not a result of a change in flux from the landfill and is instead the result of changing groundwater conditions outside the slurry wall. Corrective action has been triggered for the site as a result of data collected during the initial May 2018 assessment monitoring event. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97 and will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

GSI Statistical Evaluation

Eight monitoring wells located along the surface water features adjacent to the Weadock Landfill are included in the GSI monitoring program to meet the requirements of Part 31:

- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- JCW-MW-18004

The concentrations from each well were first compared directly to the GSI criteria, as shown on Table 2. Constituent-well combinations that included a direct exceedance of the GSI criteria within the past eight monitoring events were retained for further analysis (Attachment 2). Direct comparison GSI criteria exceedances include the following constituent well combinations:

- Arsenic in MW-55

The purpose of the GSI statistical evaluation is to assess compliance with the GSI pathway. Although the *Alternate Source Demonstration* supports that the arsenic concentrations at MW-55 are not the result of a release from the unit, these concentrations still affect compliance with the GSI pathway. Therefore, it is appropriate to calculate confidence limits for arsenic at MW-55 for comparison to the GSI criteria.

The software outputs for the assessment monitoring data evaluation are included in Attachment 2 along with data reports showing the values used for the evaluation. The percentage of non-detect observations are also included in Attachment 2.

The Sanitas™ software generates an output that includes graphs of the parametric or non-parametric confidence intervals for each well along with notes on data transformations, as appropriate. The data distributions are as follows:

Distribution	Constituent-Well Combinations
Normalized by power transformation	Arsenic at MW-55 (square root)

The confidence interval tests compare the lower confidence limit to the GSI. The statistical evaluation found that no constituents were present at statistically significant levels exceeding the site-specific GSI criteria. Arsenic concentrations at MW-55 were previously considered statistically significant; however, the arsenic concentrations decreased in 2022 and 2023. The lower confidence limits for arsenic continued to be below the GWPS in first quarter 2024.

Attachments

Table 1 Comparison of Groundwater Sampling Results to Groundwater Protection Standards
Table 2 Comparison of Groundwater Sampling Results to GSI

Attachment 1 Assessment Monitoring Sanitas™ Output Files
Attachment 2 GSI Evaluation Sanitas™ Output Files

Tables

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-50															
		Sample Date:	5/9/2022	5/9/2022	8/1/2022	8/1/2022	10/10/2022	10/10/2022	3/8/2023	3/8/2023	5/8/2023	5/8/2023	7/26/2023	7/26/2023	10/9/2023	10/9/2023	3/5/2024	3/5/2024
Constituent	Unit	GWPS																
Appendix III[1]				Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	**560**	**1,360**	**1,440**	**1,290**	**1,290**	**1,730**	**1,670**	**2,020**	**2,080**	**1,720**	**1,720**	**1,720**	**1,690**	**2,070**	**2,060**	**2,170**	**2,140**
Calcium	mg/L	**280**	169	175	161	164	186	181	152	--	142	144	188	187	205	206	199	196
Chloride	mg/L	2,300	53.3	51.6	54.2	54.9	47.7	47.6	35.9	36.7	31.5	31.9	37.4	39.1	37.6	37	40.1	38.6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	285	286	324	325	376	376	341	315	314	316	392	385	470	472	449	448
Total Dissolved Solids	mg/L	4,700	1,020	1,050	1,080	1,040	1,120	1,150	939	984	878	880	1,100	1,110	1,170	1,190	1,180	1,190
pH, Field	SU	6.5 - 8.5	7.2	--	7.0	--	7.3	--	7.3	--	7.4	--	7.4	--	7.0	--	7.5	--
Appendix IV[1]																		
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	1	1	2	2	3	3	2	2	2	2	3	3	3	3	3	3
Barium	ug/L	2,000	86	86	90	94	106	108	89	92	114	87	114	113	135	136	187	179
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	69	66	64	61	62	62	65	65	55	54	58	59	59	59	69	68
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	6	6	6	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6
Radium-226	pCi/L	NA	< 0.310	< 0.287	--	--	0.158	0.343	--	--	0.155	0.144	--	--	0.291	0.32	--	--
Radium-228	pCi/L	NA	< 0.493	0.648	--	--	1.14	1.37	--	--	0.686	< 0.606	--	--	1.15	1.46	--	--
Radium-226/228	pCi/L	5.0	0.518	0.904	--	--	1.30	1.72	--	--	0.841	0.633	--	--	1.44	1.78	--	--
Selenium	ug/L	50	2	2	2	2	2	2	1	1	1	2	1	1	< 1	2	3	3
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]																		
Iron	ug/L	28,000	723	737	1,830	1,850	2,460	2,340	604	601	755	756	1,960	1,900	2,300	2,340	889	930
Copper	ug/L	1,000	1	1	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	2	2	1	1	1	1
Nickel	ug/L	100	< 2	6	6	7	4	7	< 2	< 2	3	< 2	2	< 2	< 2	2	8	8
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-51							
		Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/26/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,350**	**1,270**	**1,490**	**1,320**	**1,230**	**1,180**	**1,170**	**935**
Calcium	mg/L	**280**	247	211	211	169	166	162	132	132
Chloride	mg/L	2,300	92.8	102	101	98.4	99.9	97	91.6	78.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	420	404	394	360	356	308	267	266
Total Dissolved Solids	mg/L	4,700	1,510	1,450	1,380	1,180	1,240	1,100	952	902
pH, Field	SU	6.5 - 8.5	7.2	7.0	7.2	7.2	7.3	7.4	7.2	7.4
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	10	15	18	10	8	10	18	10
Barium	ug/L	2,000	150	169	188	178	180	141	141	127
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	1	< 1	< 1	< 1	< 1	2	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	56	53	50	46	40	40	34	31
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.423	--	< 0.397	--	0.143	--	0.285	--
Radium-228	pCi/L	NA	< 0.494	--	2.19	--	1.01	--	1.23	--
Radium-226/228	pCi/L	5.0	0.576	--	2.51	--	1.15	--	1.52	--
Selenium	ug/L	50	2	2	1	2	1	< 1	< 1	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	1,210	1,860	2,880	514	450	1,290	1,660	446
Copper	ug/L	1,000	2	< 1	1	< 1	1	3	2	1
Nickel	ug/L	100	< 2	6	4	< 2	3	4	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-52							
		Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,090**	**1,070**	**1,330**	**1,040**	**993**	**1,030**	**1,140**	**945**
Calcium	mg/L	**280**	231	222	224	228	217	247	234	237
Chloride	mg/L	2,300	50.5	45.1	40.4	36.3	32.4	31.5	30.2	33.8
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	591	663	603	581	581	569	572	540
Total Dissolved Solids	mg/L	4,700	1,490	1,580	1,670	1,430	1,430	1,520	1,440	1,380
pH, Field	SU	6.5 - 8.5	7.0	6.7	6.9	6.8	6.9	6.6	6.8	7.0
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	107	118	122	102	95	99	108	94
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	1	< 1	< 1	< 1	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	25	29	26	27	23	27	27	27
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.489	--	0.205	--	< 0.128	--	0.444	--
Radium-228	pCi/L	NA	< 0.532	--	< 0.694	--	< 0.594	--	1.64	--
Radium-226/228	pCi/L	5.0	0.875	--	0.805	--	< 0.594	--	2.08	--
Selenium	ug/L	50	2	2	2	1	< 1	< 1	< 1	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	2,030	5,020	6,340	2,820	2,720	6,720	7,560	3,120
Copper	ug/L	1,000	2	2	2	1	1	2	1	2
Nickel	ug/L	100	< 2	5	3	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-53							
		Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**3,880**	**4,300**	**4,140**	**2,150**	**2,620**	**4,370**	**5,530**	**5,740**
Calcium	mg/L	**280**	147	116	108	82.5	104	146	136	134
Chloride	mg/L	2,300	50.9	66.5	53	24.8	56.5	80.3	77.4	77.4
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	215	119	126	93.6	50.8	7.39	2.28	25.4
Total Dissolved Solids	mg/L	4,700	886	820	740	489	613	792	722	694
pH, Field	SU	6.5 - 8.5	7.3	7.1	7.3	7.3	7.4	7.1	7.3	7.5
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	1	2	< 1	< 1	1	1	1
Barium	ug/L	2,000	356	313	285	202	272	692	719	654
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	41	42	38	33	34	44	42	50
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	7	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	0.406	--	0.269	--	0.198	--	0.679	--
Radium-228	pCi/L	NA	< 0.518	--	1.15	--	< 0.518	--	1.72	--
Radium-226/228	pCi/L	5.0	0.824	--	1.42	--	0.700	--	2.400	--
Selenium	ug/L	50	1	3	1	1	2	2	2	3
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	1,060	1,240	1,140	403	569	1,390	1,080	947
Copper	ug/L	1,000	1	< 1	< 1	< 1	< 1	< 1	< 1	1
Nickel	ug/L	100	< 2	4	2	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-53R							
		Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,830**	**1,560**	**2,340**	**2,330**	**2,140**	**2,190**	**2,420**	**2,300**
Calcium	mg/L	**280**	226	219	203	195	202	220	206	173
Chloride	mg/L	2,300	41.6	50.4	39.2	27.2	30	34.6	35.5	34.7
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	314	533	250	101	185	217	221	53.2
Total Dissolved Solids	mg/L	4,700	1,290	1,530	1,160	960	1,060	1,150	1,090	862
pH, Field	SU	6.5 - 8.5	6.9	6.7	6.8	6.7	6.8	6.7	7.0	7.0
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	8	17	20	17	14	17	16	9
Barium	ug/L	2,000	147	97	118	179	174	144	110	165
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	1	< 1	< 1	< 1	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	61	70	63	59	56	62	61	56
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.325	--	0.239	--	0.275	--	0.174	--
Radium-228	pCi/L	NA	< 0.480	--	0.967	--	0.490	--	0.968	--
Radium-226/228	pCi/L	5.0	< 0.480	--	1.21	--	0.765	--	1.14	--
Selenium	ug/L	50	2	2	2	1	1	2	1	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	460	1,030	702	1,580	1,410	1,180	834	752
Copper	ug/L	1,000	2	2	1	1	1	1	1	2
Nickel	ug/L	100	< 2	5	3	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

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All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-54R							
		Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**4,110**	**4,970**	**5,310**	**5,660**	**5,240**	**6,170**	**5,520**	**5,940**
Calcium	mg/L	**280**	169	158	160	168	163	162	165	170
Chloride	mg/L	2,300	35.8	43.9	47.4	49.6	46.5	48.5	45	61.7
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	86.3	72.1	70.9	62	67.2	73.8	67.4	48.6
Total Dissolved Solids	mg/L	4,700	712	800	799	770	759	761	756	752
pH, Field	SU	6.5 - 8.5	7.0	6.9	6.9	6.8	6.9	6.8	7.0	7.0
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	2	2	1	< 1	< 1	1	1
Barium	ug/L	2,000	111	109	123	126	98	106	113	97
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	2	< 1	< 1	< 1	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	64	74	74	71	65	75	70	76
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	9	10	12	15	13	15	17	15
Radium-226	pCi/L	NA	< 0.347	--	0.208	--	< 0.141	--	0.16	--
Radium-228	pCi/L	NA	< 0.552	--	1.31	--	< 0.836	--	1.38	--
Radium-226/228	pCi/L	5.0	< 0.552	--	1.52	--	< 0.836	--	1.54	--
Selenium	ug/L	50	2	1	2	1	1	1	1	3
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	121	367	1,090	262	74	111	829	159
Copper	ug/L	1,000	1	1	1	2	1	6	2	2
Nickel	ug/L	100	< 2	2	< 2	< 2	< 2	< 2	2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

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(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-55								
		Sample Date:	5/10/2022	8/1/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS									
Appendix III[1]					Field Dup						
Boron	ug/L	**560**	**642**	**709**	**687**	**976**	**1,110**	**1,140**	**1,290**	**1,200**	**825**
Calcium	mg/L	**280**	177	159	165	141	162	165	150	163	166
Chloride	mg/L	2,300	11.8	11.8	11.8	12.5	24.2	16.9	18.5	16.7	18.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	249	248	245	108	94.6	208	129	156	224
Total Dissolved Solids	mg/L	4,700	942	930	1,040	786	898	929	827	846	866
pH, Field	SU	6.5 - 8.5	7.0	6.9	--	7.0	6.8	6.9	6.9	7.0	6.9
Appendix IV[1]											
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	**48**	**80**	**78**	**126**	**68**	**44**	**75**	**75**	**46**
Barium	ug/L	2,000	222	232	231	223	287	267	240	248	260
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	24	29	28	30	27	24	27	26	26
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	**78**	**80**	**78**	**91**	50	30	33	56	27
Radium-226	pCi/L	NA	< 0.478	--	--	0.365	--	0.276	--	0.406	--
Radium-228	pCi/L	NA	< 0.646	--	--	0.966	--	< 0.916	--	1.26	--
Radium-226/228	pCi/L	5.0	0.696	--	--	1.33	--	< 0.916	--	1.67	--
Selenium	ug/L	50	3	3	4	< 1	3	< 1	1	1	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]											
Iron	ug/L	28,000	15,000	18,000	16,600	22,100	24,800	21,600	21,900	16,800	18,700
Copper	ug/L	1,000	1	< 1	1	1	< 1	< 1	< 1	< 1	1
Nickel	ug/L	100	3	6	6	4	4	5	22	3	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	OW-57R OUT							
		Sample Date:	5/10/2022	8/2/2022	10/11/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/6/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,990**	**1,570**	**1,830**	**1,860**	**1,740**	**1,750**	**1,790**	**1,810**
Calcium	mg/L	**280**	131	113	114	116	117	124	120	123
Chloride	mg/L	2,300	57.3	52.0	47.6	59	64.2	53.7	50.6	68.1
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,230
Sulfate	mg/L	**780**	69.4	85.0	86.8	79.7	80.5	79	94.8	79.3
Total Dissolved Solids	mg/L	4,700	702	714	722	790	743	762	758	770
pH, Field	SU	6.5 - 8.5	7.1	6.8	6.9	6.9	7.1	6.9	7.0	7.2
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Barium	ug/L	2,000	79	67	75	75	72	72	77	81
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	2	1	< 1	4	< 1	< 1	< 1	2
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,230
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	27	23	22	26	23	24	23	28
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	7	7	8	6	6	6	7	6
Radium-226	pCi/L	NA	< 0.440	--	0.199	--	0.149	--	< 0.155	--
Radium-228	pCi/L	NA	< 0.539	--	< 0.711	--	< 0.663	--	0.586	--
Radium-226/228	pCi/L	5.0	< 0.539	--	0.870	--	< 0.663	--	0.680	--
Selenium	ug/L	50	3	1	2	2	2	1	< 1	< 1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	74	37	42	53	78	30	40	44
Copper	ug/L	1,000	2	1	2	1	1	1	2	2
Nickel	ug/L	100	14	17	16	15	15	13	15	12
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18001							
		Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/8/2023	5/8/2023	7/26/2023	10/5/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,560**	**1,470**	**1,790**	**1,440**	**1,380**	**1,470**	**1,620**	**1,420**
Calcium	mg/L	**280**	**335**	**389**	**465**	**486**	**496**	**555**	**562**	**557**
Chloride	mg/L	2,300	58.8	64.6	63.6	54.2	51.1	58.9	51.1	44.7
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	752	**1,180**	**1,400**	**1,640**	**1,670**	**1,770**	**1,890**	**1,880**
Total Dissolved Solids	mg/L	4,700	1,970	2,580	3,020	3,030	1,580	3,530	3,430	3,450
pH, Field	SU	6.5 - 8.5	7.0	6.6	6.8	6.7	6.7	6.8	6.5	6.8
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Barium	ug/L	2,000	80	61	66	47	50	49	48	49
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	2	< 1	< 1	< 1	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	76	95	97	91	83	102	110	106
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.327	--	< 0.142	--	< 0.122	--	< 0.139	--
Radium-228	pCi/L	NA	0.494	--	0.852	--	< 0.547	--	0.783	--
Radium-226/228	pCi/L	5.0	0.586	--	0.893	--	< 0.547	--	0.886	--
Selenium	ug/L	50	2	3	1	2	2	2	1	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	210	196	818	830	1,180	2,790	3,840	3,570
Copper	ug/L	1,000	3	2	3	2	3	2	2	3
Nickel	ug/L	100	8	14	15	< 2	< 2	41	3	14
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	2	< 2	3
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18004							
		Sample Date:	5/10/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	226	313	343	180	227	310	319	192
Calcium	mg/L	**280**	235	215	193	221	265	229	218	238
Chloride	mg/L	2,300	10.8	12.5	11.4	12.7	16.8	14.2	15.8	16.9
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	512	512	428	533	722	478	466	557
Total Dissolved Solids	mg/L	4,700	1,290	1,290	1,130	1,250	1,530	1,220	1,160	1,250
pH, Field	SU	6.5 - 8.5	6.8	6.7	6.8	6.8	6.8	6.8	7.0	7.0
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	26	31	37	24	28	30	34	26
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	42	51	46	39	42	50	49	43
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.417	--	< 0.135	--	< 0.131	--	< 0.155	--
Radium-228	pCi/L	NA	0.790	--	< 0.742	--	< 0.600	--	1.24	--
Radium-226/228	pCi/L	5.0	0.910	--	< 0.742	--	< 0.600	--	1.3	--
Selenium	ug/L	50	2	1	1	11	2	2	< 1	4
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	< 20	45	< 20	46	67	24	36	98
Copper	ug/L	1,000	2	2	2	1	2	2	2	2
Nickel	ug/L	100	< 2	2	5	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

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(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18005							
		Sample Date:	5/10/2022	8/2/2022	10/11/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/6/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,010**	**981**	**1,290**	**930**	**992**	**1,170**	**1,470**	**1,000**
Calcium	mg/L	**280**	280	165	150	262	258	202	159	**335**
Chloride	mg/L	2,300	32.6	50.9	53.9	25.4	22.3	44.1	48.1	23.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	437	213	160	435	422	216	154	512
Total Dissolved Solids	mg/L	4,700	1,330	967	868	1,250	1,190	1,000	884	1400
pH, Field	SU	6.5 - 8.5	6.8	6.7	6.8	6.6	6.8	6.8	6.9	6.7
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	5	4	5	4	2	< 1	1	3
Barium	ug/L	2,000	110	71	80	115	105	76	74	136
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	33	32	32	36	33	33	32	43
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	6	< 5	5	6	5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.414	--	0.193	--	0.134	--	0.221	--
Radium-228	pCi/L	NA	< 0.521	--	< 0.800	--	< 0.573	--	1.17	--
Radium-226/228	pCi/L	5.0	0.622	--	< 0.800	--	< 0.573	--	1.39	--
Selenium	ug/L	50	2	< 1	2	3	2	2	1	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	1,680	2,810	3,220	1,720	676	171	948	4,020
Copper	ug/L	1,000	2	< 1	< 1	1	< 1	2	1	7
Nickel	ug/L	100	< 2	9	11	< 2	9	8	9	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

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(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

Sample Location:			JCW-MW-18006														
Sample Date:			5/9/2022	5/9/2022	8/2/2022	10/11/2022	10/11/2022	3/9/2023	3/9/2023	5/9/2023	5/9/2023	7/31/2023	7/31/2023	10/9/2023	10/9/2023	3/6/2024	3/6/2024
Constituent	Unit	GWPS															
Appendix III[1]				Field Dup			Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	**560**	**2,990**	**3,030**	**2,260**	**2,720**	**2,650**	**1,730**	**1,760**	**2,450**	**2,480**	**2,100**	**2,140**	**2,280**	**2,470**	**2,650**	**2,700**
Calcium	mg/L	**280**	136	136	109	118	119	121	121	118	120	126	126	117	119	137	136
Chloride	mg/L	2,300	67.3	67.7	79.0	74.2	74.7	79.9	82.8	73.6	76.6	73	75.9	72.3	71.1	61.3	64.7
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	32.8	34.0	14.9	21.6	23.0	32.5	33.9	34.2	36.1	39.4	37.9	46.9	47.6	69.7	71.6
Total Dissolved Solids	mg/L	4,700	788	772	709	720	746	715	753	734	751	765	770	738	748	748	776
pH, Field	SU	6.5 - 8.5	7.0	--	6.7	6.9	--	6.9	--	7.0	--	6.9	--	7.0	--	7.0	--
Appendix IV[1]																	
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	**22**	**23**	21	**25**	**25**	5	5	**23**	**23**	18	19	17	18	**22**	**23**
Barium	ug/L	2,000	514	509	452	480	499	232	238	464	465	354	346	342	381	445	464
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	56	57	52	52	52	21	23	45	47	36	36	37	39	52	54
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	< 0.416	--	--	0.516	0.259	--	--	0.337	< 0.192	--	--	0.506	0.431	--	--
Radium-228	pCi/L	NA	< 0.518	--	--	< 0.609	0.869	--	--	0.746	< 0.816	--	--	0.783	1.39	--	--
Radium-226/228	pCi/L	5.0	0.690	--	--	0.999	1.13	--	--	1.08	< 0.816	--	--	1.29	1.82	--	--
Selenium	ug/L	50	< 1	1	< 1	1	1	2	2	1	2	2	2	< 1	1	3	3
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]																	
Iron	ug/L	28,000	6,600	6,360	7,670	7,620	7,630	2,930	2,910	6,890	7,210	6,910	6,860	5,660	5,930	7,970	7,890
Copper	ug/L	1,000	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	2	2
Nickel	ug/L	100	< 2	< 2	5	5	6	< 2	< 2	4	< 2	< 2	< 2	< 2	3	5	9
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	3	3	3	3	4	< 2	2	2	3	3	3	2	2	4	4
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-50															
					Sample Date:	5/9/2022	5/9/2022	8/1/2022	8/1/2022	10/10/2022	10/10/2022	3/8/2023	3/8/2023	5/8/2023	5/8/2023	7/26/2023	7/26/2023	10/9/2023	10/9/2023	3/5/2024	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**																
Appendix III(1)							Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	4,000	44,000	69,000	44,000	1,360	1,440	1,290	1,290	1,730	1,670	2,020	2,080	1,720	1,720	1,720	1,690	2,070	2,060	2,170	2,140
Sulfate	mg/L	1,200[F]	NC	NC	1,200	285	286	324	325	376	376	341	315	314	316	392	385	470	472	449	448
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.2	--	7.0	--	7.3	--	7.3	--	7.4	--	7.4	--	7.0	--	7.5	--
Appendix IV(1)																					
Arsenic	ug/L	10	100	680	**100**	1	1	2	2	3	3	2	2	2	2	3	3	3	3	3	3
Chromium	ug/L	11[H]	NC	NC	11	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1
Lithium	ug/L	440	NC	NC	440	69	66	64	61	62	62	65	65	55	54	58	59	59	59	69	68
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	6	6	6	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6
Selenium	ug/L	5.0	55	120	55	2	2	2	2	2	2	1	1	1	2	1	1	< 1	2	3	3
MI Part 115 Parameters(2)																					
Iron	ug/L	500,000[EE]	NC	NC	500,000	723	737	1,830	1,850	2,460	2,340	604	601	755	756	1,960	1,900	2,300	2,340	889	930
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-51							
					Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/26/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	1,350	1,270	1,490	1,320	1,230	1,180	1,170	935
Sulfate	mg/L	1,200[F]	NC	NC	1,200	420	404	394	360	356	308	267	266
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.2	7.0	7.2	7.2	7.3	7.4	7.2	7.4
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	10	15	18	10	8	10	18	10
Chromium	ug/L	11[H]	NC	NC	11	1	< 1	< 1	< 1	< 1	2	< 1	1
Lithium	ug/L	440	NC	NC	440	56	53	50	46	40	40	34	31
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55	2	2	1	2	1	< 1	< 1	1
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	1,210	1,860	2,880	514	450	1,290	1,660	446
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-52							
					Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	1,090	1,070	1,330	1,040	993	1,030	1,140	945
Sulfate	mg/L	1,200[F]	NC	NC	1,200	591	663	603	581	581	569	572	540
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.0	6.7	6.9	6.8	6.9	6.6	6.8	7.0
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium	ug/L	11[H]	NC	NC	11	1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	25	29	26	27	23	27	27	27
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55	2	2	2	1	< 1	< 1	< 1	2
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	2,030	5,020	6,340	2,820	2,720	6,720	7,560	3,120
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

						Sample Location:	MW-53						
						Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**									
Appendix III[(1)]														
Boron	ug/L	4,000	44,000	69,000	44,000		3,880	4,300	4,140	2,150	2,620	4,370	5,530	5,740
Sulfate	mg/L	1,200[F]	NC	NC	1,200		215	119	126	93.6	50.8	7.39	2.28	25.4
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0		7.3	7.1	7.3	7.3	7.4	7.1	7.3	7.5
Appendix IV[(1)]														
Arsenic	ug/L	10	100	680	**100**		< 1	1	2	< 1	< 1	1	1	1
Chromium	ug/L	11[H]	NC	NC	11		< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440		41	42	38	33	34	44	42	50
Molybdenum	ug/L	120	NC	NC	120		< 5	< 5	< 5	7	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55		1	3	1	1	2	2	2	3
MI Part 115 Parameters[(2)]														
Iron	ug/L	500,000[EE]	NC	NC	500,000		1,060	1,240	1,140	403	569	1,390	1,080	947
Vanadium	ug/L	27	NC	NC	27		< 2	< 2	< 2	< 2	< 2	< 2	< 2	2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-53R							
					Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III(1)													
Boron	ug/L	4,000	44,000	69,000	44,000	1,830	1,560	2,340	2,330	2,140	2,190	2,420	2,300
Sulfate	mg/L	1,200[F]	NC	NC	1,200	314	533	250	101	185	217	221	53.2
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.9	6.7	6.8	6.7	6.8	6.7	7.0	7.0
Appendix IV(1)													
Arsenic	ug/L	10	100	680	**100**	8	17	20	17	14	17	16	9
Chromium	ug/L	11[H]	NC	NC	11	1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	61	70	63	59	56	62	61	56
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	<5	< 5
Selenium	ug/L	5.0	55	120	55	2	2	2	1	1	2	1	2
MI Part 115 Parameters(2)													
Iron	ug/L	500,000[EE]	NC	NC	500,000	460	1,030	702	1,580	1,410	1,180	834	752
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-54R							
					Sample Date:	5/9/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	4,110	4,970	5,310	5,660	5,240	6,170	5,520	5,940
Sulfate	mg/L	1,200[F]	NC	NC	1,200	86.3	72.1	70.9	62	67.2	73.8	67.4	48.6
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.0	6.9	6.9	6.8	6.9	6.8	7.0	7.0
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	< 1	2	2	1	< 1	< 1	1	1
Chromium	ug/L	11[H]	NC	NC	11	2	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	64	74	74	71	65	75	70	76
Molybdenum	ug/L	120	NC	NC	120	9	10	12	15	13	15	17	15
Selenium	ug/L	5.0	55	120	55	2	1	2	1	1	1	1	3
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	121	367	1,090	262	74	111	829	159
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

						MW-55								
					Sample Location:									
					Sample Date:	5/10/2022	8/1/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**			Field Dup						
Appendix III(1)														
Boron	ug/L	4,000	44,000	69,000	44,000	642	709	687	976	1,110	1,140	1,290	1,200	825
Sulfate	mg/L	1,200[F]	NC	NC	1,200	249	248	245	108	94.6	208	129	156	224
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.0	6.9	--	7.0	6.8	6.9	6.9	7.0	6.9
Appendix IV(1)														
Arsenic	ug/L	10	100	680	**100**	48	80	78	**126**	68	44	75	75	46
Chromium	ug/L	11[H]	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	24	29	28	30	27	24	27	26	26
Molybdenum	ug/L	120	NC	NC	120	78	80	78	91	50	30	33	56	27
Selenium	ug/L	5.0	55	120	55	3	3	4	< 1	3	< 1	1	1	1
MI Part 115 Parameters(2)														
Iron	ug/L	500,000[EE]	NC	NC	500,000	15,000	18,000	16,600	22,100	24,800	21,600	21,900	16,800	18,700
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	JCW-MW-18004							
					Sample Date:	5/10/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	226	313	343	180	227	310	319	192
Sulfate	mg/L	1,200[F]	NC	NC	1,200	512	512	428	533	722	478	466	557
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.8	6.7	6.8	6.8	6.8	6.8	7.0	7.0
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium	ug/L	11[H]	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	42	51	46	39	42	50	49	43
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55	2	1	1	11	2	2	< 1	4
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	< 20	45	< 20	46	67	24	36	98
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

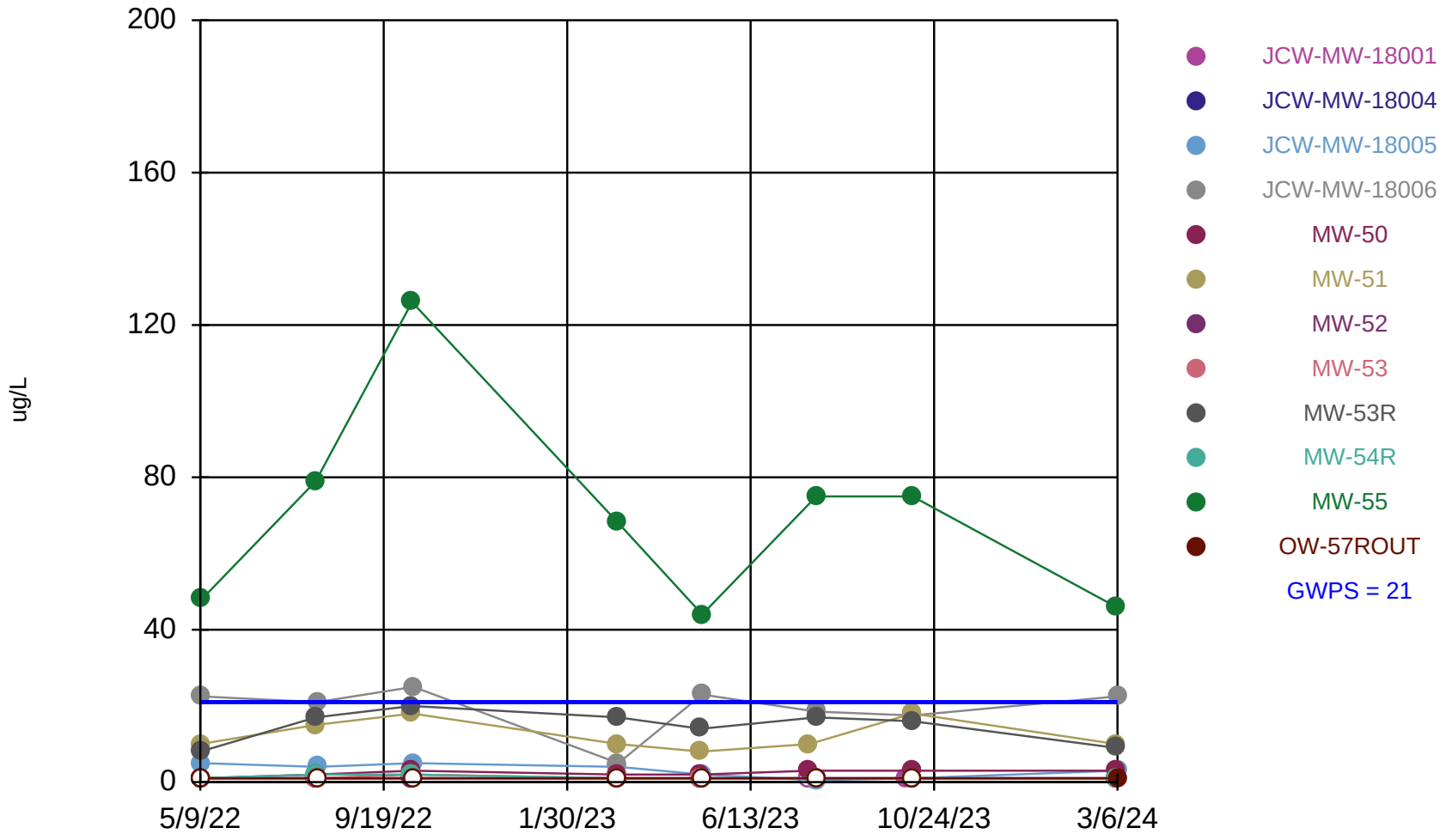
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Attachment 1
Assessment Monitoring Sanitas™ Output Files

Hollow symbols indicate censored values.

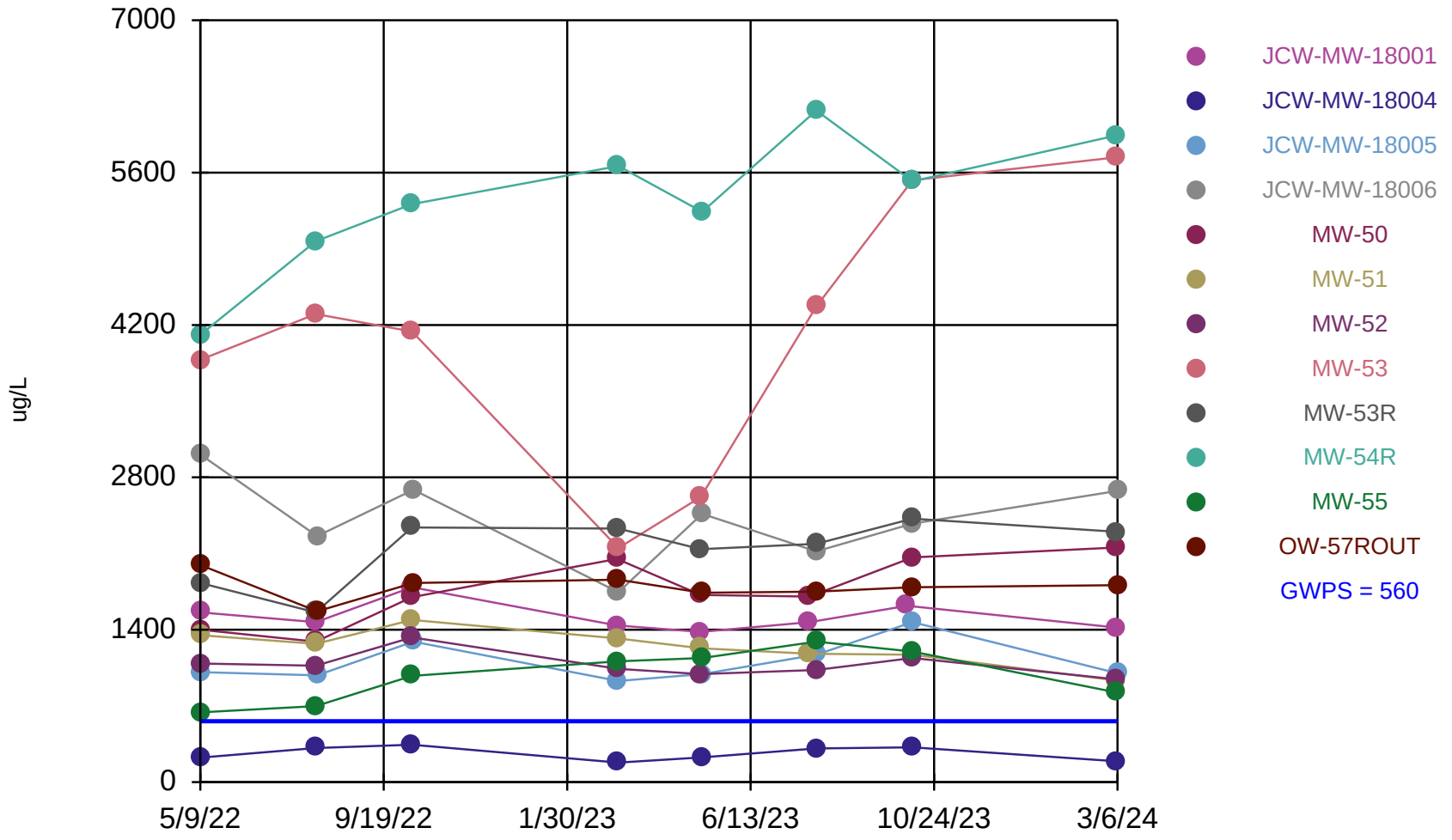
Arsenic Comparison to GWPS



Time Series Analysis Run 4/7/2024 8:56 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

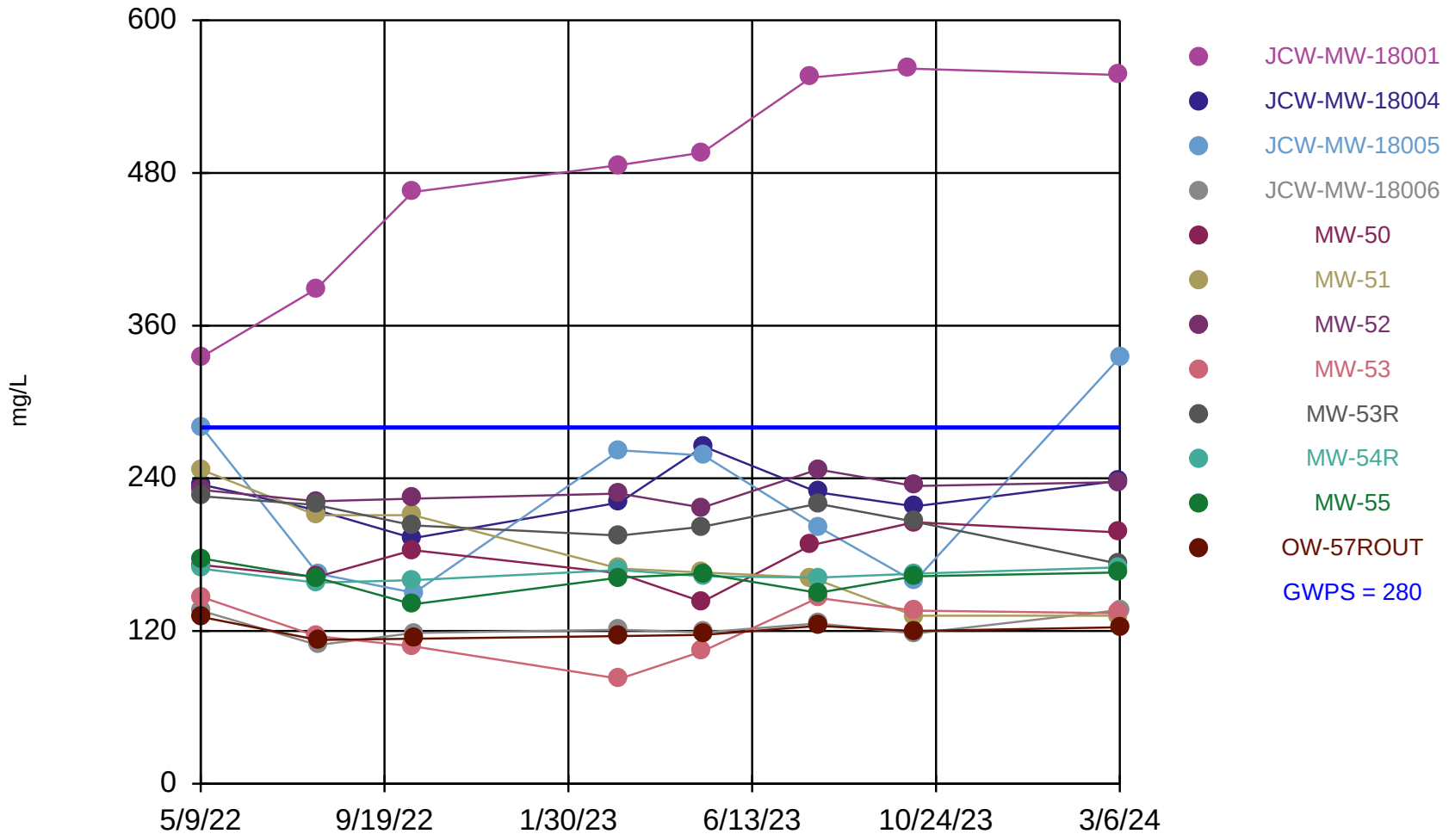
Boron Comparison to GWPS



Time Series Analysis Run 4/7/2024 8:59 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Calcium Comparison to GWPS

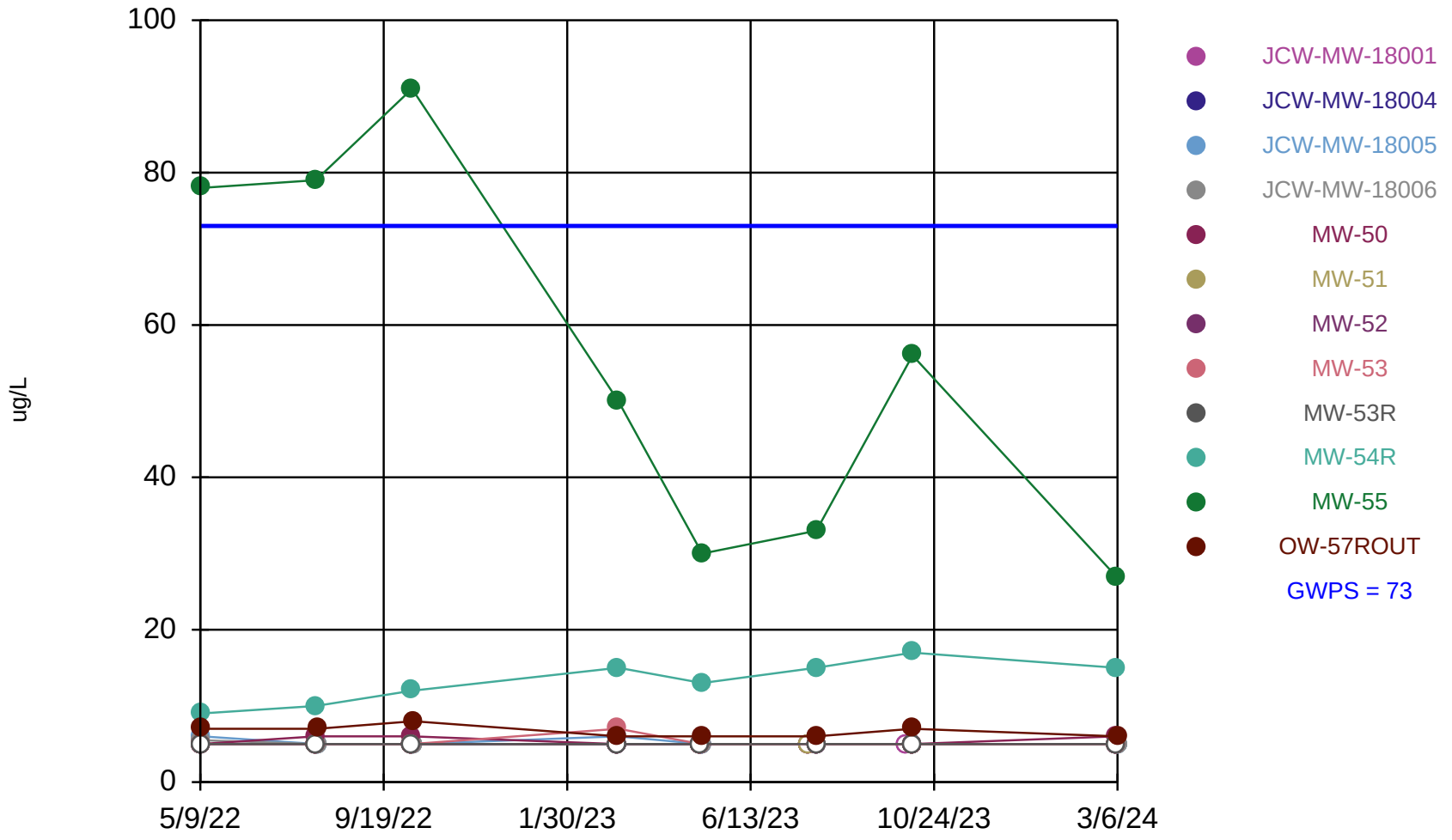


Time Series Analysis Run 4/7/2024 9:01 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Hollow symbols indicate censored values.

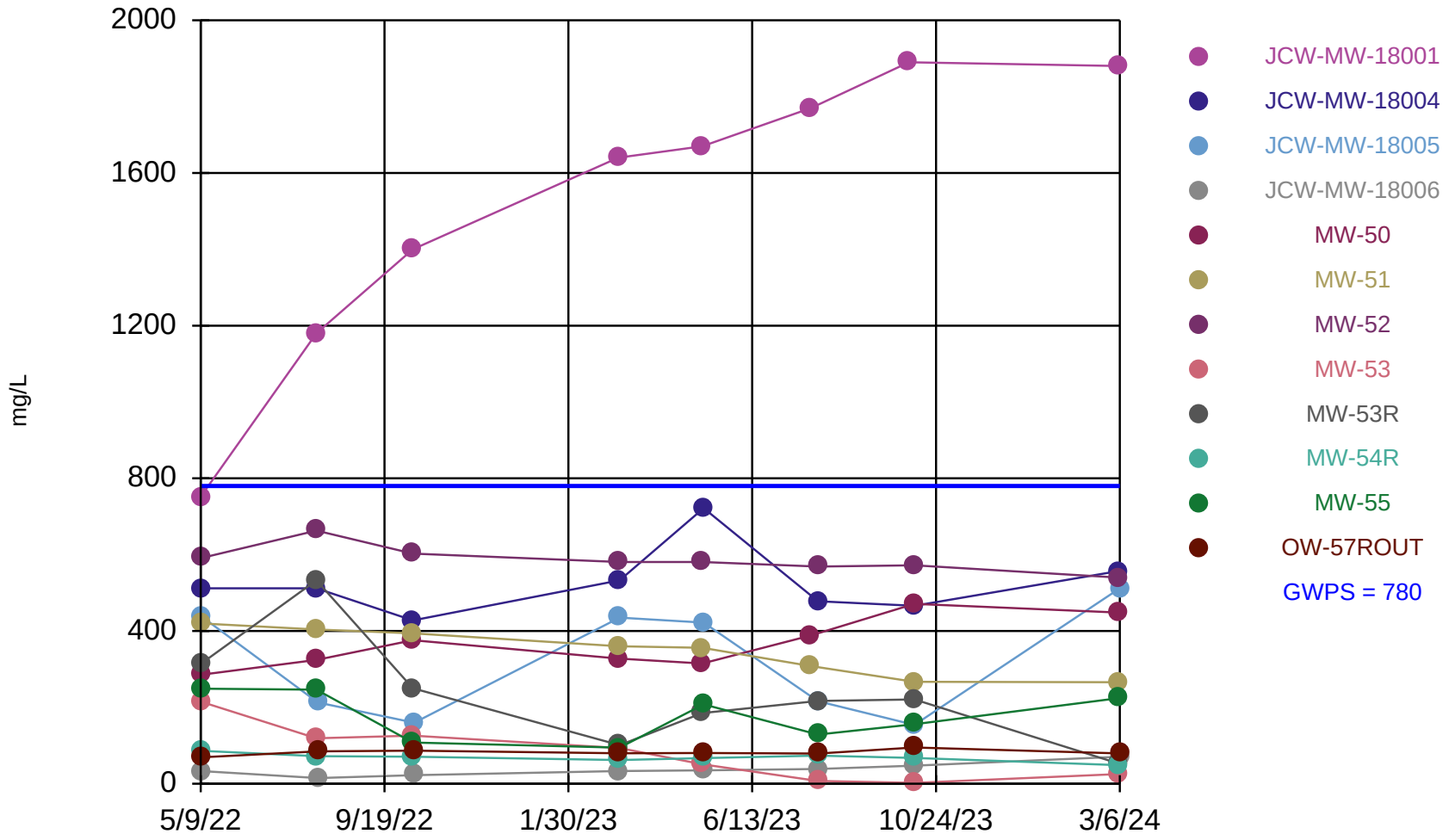
Molybdenum Comparison to GWPS



Time Series Analysis Run 4/7/2024 9:05 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Sulfate Comparison to GWPS



Time Series Analysis Run 4/7/2024 9:07 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Summary Report

Constituent: Arsenic, Total Analysis Run 4/7/2024 9:11 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

For observations made between 5/9/2022 and 3/6/2024, a summary of the selected data set:

Observations = 96
NDs = 38%
Wells = 12
Minimum Value = 0.5
Maximum Value = 126
Mean Value = 10.7
Median Value = 1.5
Standard Deviation = 20.53
Coefficient of Variation = 1.918
Skewness = 3.259

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	87%	1	1	1	1	0	0	NaN
JCW-MW-18004	8	100%	1	1	1	1	0	0	NaN
JCW-MW-18005	8	12%	0.5	5	3.063	3.5	1.741	0.5685	-0.3069
JCW-MW-18006	8	0%	5	25	19.38	21.75	6.301	0.3252	-1.641
MW-50	8	0%	1	3	2.375	2.5	0.744	0.3133	-0.6605
MW-51	8	0%	8	18	12.38	10	3.998	0.3231	0.5658
MW-52	8	100%	1	1	1	1	0	0	NaN
MW-53	8	37%	1	2	1.125	1	0.3536	0.3143	2.268
MW-53R	8	0%	8	20	14.75	16.5	4.2	0.2848	-0.6538
MW-54R	8	37%	1	2	1.25	1	0.4629	0.3703	1.155
MW-55	8	0%	44	126	70.13	71.5	26.74	0.3814	1.059
OW-57ROUT	8	87%	1	1	1	1	0	0	NaN

Summary Report

Constituent: Boron, Total Analysis Run 4/7/2024 9:11 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

For observations made between 5/9/2022 and 3/6/2024, a summary of the selected data set:

Observations = 96
NDs = 0%
Wells = 12
Minimum Value = 180
Maximum Value = 6170
Mean Value = 1980
Median Value = 1560
Standard Deviation = 1441
Coefficient of Variation = 0.7275
Skewness = 1.466

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0%	1380	1790	1519	1470	133.9	0.08816	1.063
JCW-MW-18004	8	0%	180	343	263.8	268.5	64.18	0.2433	-0.1013
JCW-MW-18005	8	0%	930	1470	1105	1005	189.2	0.1711	0.9978
JCW-MW-18006	8	0%	1745	3010	2417	2420	388.9	0.1609	-0.2289
MW-50	8	0%	1290	2155	1761	1713	314.4	0.1786	-0.1859
MW-51	8	0%	935	1490	1243	1250	161.9	0.1302	-0.4737
MW-52	8	0%	945	1330	1080	1055	117.2	0.1086	1.195
MW-53	8	0%	2150	5740	4091	4220	1247	0.3049	-0.2376
MW-53R	8	0%	1560	2420	2139	2245	296.4	0.1386	-1.065
MW-54R	8	0%	4110	6170	5365	5415	636.9	0.1187	-0.7681
MW-55	8	0%	642	1290	985.1	1043	240.4	0.244	-0.2666
OW-57ROUT	8	0%	1570	1990	1793	1800	119.1	0.06646	-0.2861

Summary Report

Constituent: Calcium, Total Analysis Run 4/7/2024 9:11 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

For observations made between 5/9/2022 and 3/6/2024, a summary of the selected data set:

Observations = 96
NDs = 0%
Wells = 12
Minimum Value = 82.5
Maximum Value = 562
Mean Value = 201.2
Median Value = 169
Standard Deviation = 99.07
Coefficient of Variation = 0.4923
Skewness = 2.183

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0%	335	562	480.6	491	82.89	0.1725	-0.6601
JCW-MW-18004	8	0%	193	265	226.8	225	20.87	0.09205	0.2861
JCW-MW-18005	8	0%	150	335	226.4	230	67.27	0.2972	0.2587
JCW-MW-18006	8	0%	109	136.5	123	120	9.423	0.07661	0.3016
MW-50	8	0%	143	205.5	177.1	177.8	20.38	0.1151	-0.2145
MW-51	8	0%	132	247	178.8	167.5	40.79	0.2282	0.3891
MW-52	8	0%	217	247	230	229.5	9.472	0.04118	0.4292
MW-53	8	0%	82.5	147	121.7	125	22.86	0.1878	-0.4231
MW-53R	8	0%	173	226	205.5	204.5	16.89	0.08221	-0.6784
MW-54R	8	0%	158	170	164.4	164	4.373	0.02661	-0.06214
MW-55	8	0%	141	177	160.8	162.5	10.85	0.06747	-0.5288
OW-57ROUT	8	0%	113	131	119.8	118.5	6.042	0.05045	0.6675

Summary Report

Constituent: Molybdenum, Total Analysis Run 4/7/2024 9:11 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

For observations made between 5/9/2022 and 3/6/2024, a summary of the selected data set:

Observations = 96
NDs = 65%
Wells = 12
Minimum Value = 5
Maximum Value = 91
Mean Value = 10.11
Median Value = 5
Standard Deviation = 15.51
Coefficient of Variation = 1.534
Skewness = 3.817

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	100%	5	5	5	5	0	0	NaN
JCW-MW-18004	8	100%	5	5	5	5	0	0	NaN
JCW-MW-18005	8	50%	5	6	5.25	5	0.4629	0.08817	1.155
JCW-MW-18006	8	87%	5	5.5	5.063	5	0.1768	0.03492	2.268
MW-50	8	62%	5	6	5.375	5	0.5175	0.09629	0.5164
MW-51	8	100%	5	5	5	5	0	0	NaN
MW-52	8	100%	5	5	5	5	0	0	NaN
MW-53	8	87%	5	7	5.25	5	0.7071	0.1347	2.268
MW-53R	8	100%	5	5	5	5	0	0	NaN
MW-54R	8	0%	9	17	13.25	14	2.765	0.2086	-0.3198
MW-55	8	0%	27	91	55.5	53	24.84	0.4475	0.1776
OW-57ROUT	8	0%	6	8	6.625	6.5	0.744	0.1123	0.6605

Summary Report

Constituent: Sulfate Analysis Run 4/7/2024 9:11 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

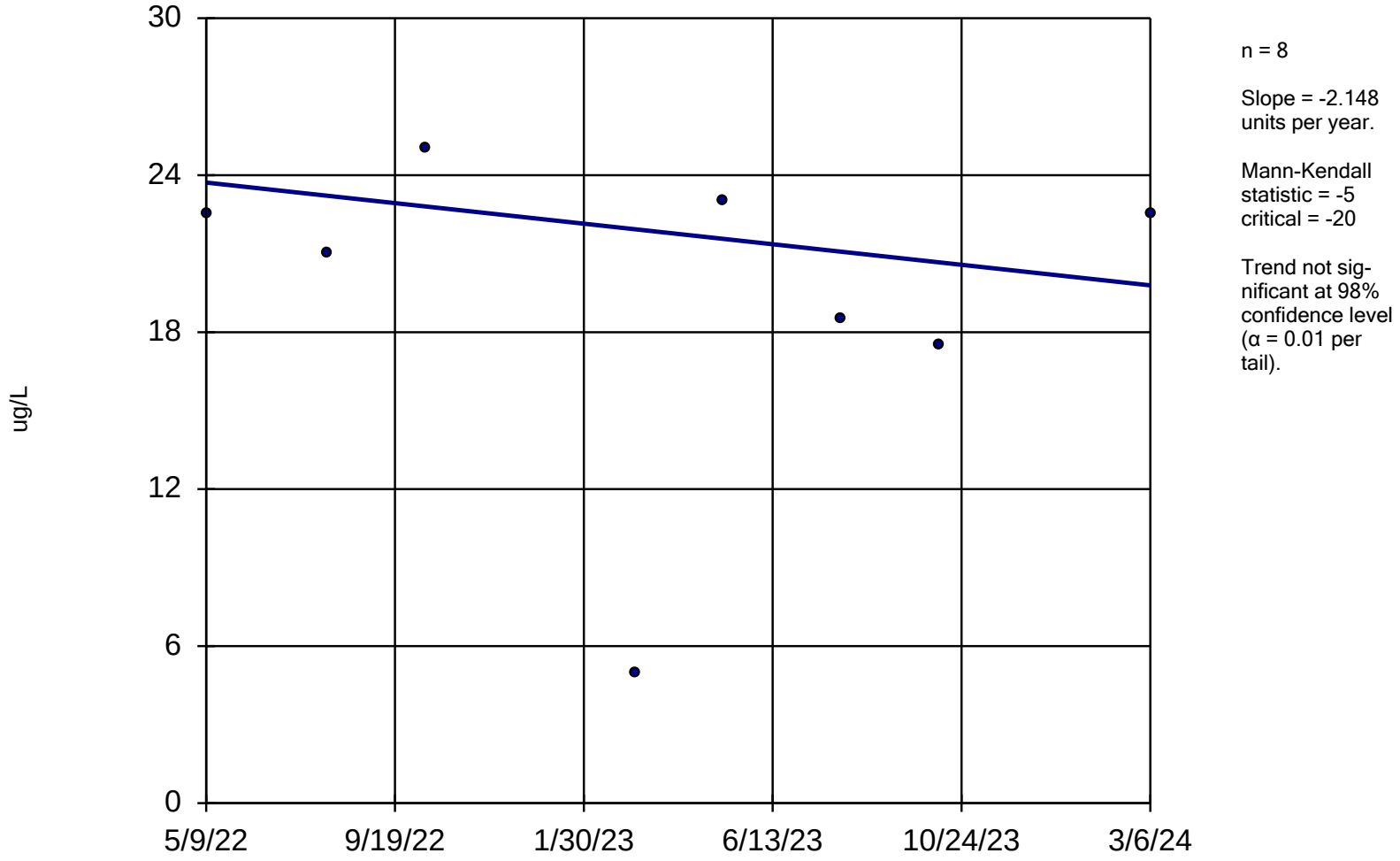
For observations made between 5/9/2022 and 3/6/2024, a summary of the selected data set:

Observations = 96
NDs = 0%
Wells = 12
Minimum Value = 2.28
Maximum Value = 1890
Mean Value = 362.3
Median Value = 247.8
Standard Deviation = 412.9
Coefficient of Variation = 1.14
Skewness = 2.263

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0%	752	1890	1523	1655	393.8	0.2586	-0.9625
JCW-MW-18004	8	0%	428	722	526	512	88.9	0.169	1.366
JCW-MW-18005	8	0%	154	512	318.6	319	146.2	0.4588	0.04197
JCW-MW-18006	8	0%	14.9	70.65	36.94	34.28	16.8	0.4548	0.8207
MW-50	8	0%	285.5	471	367.1	352	66.2	0.1803	0.4461
MW-51	8	0%	266	420	346.9	358	60.38	0.1741	-0.286
MW-52	8	0%	540	663	587.5	581	35.61	0.06061	1.07
MW-53	8	0%	2.28	215	79.93	72.2	72.89	0.9119	0.6258
MW-53R	8	0%	53.2	533	234.3	219	146	0.6234	0.9187
MW-54R	8	0%	48.6	86.3	68.54	69.15	10.72	0.1564	-0.2973
MW-55	8	0%	94.6	249	176.9	182	62.66	0.3542	-0.09686
OW-57ROUT	8	0%	69.4	94.8	81.81	80.1	7.35	0.08984	0.148

Arsenic, Total

JCW-MW-18006



n = 8

Slope = -2.148 units per year.

Mann-Kendall statistic = -5
critical = -20

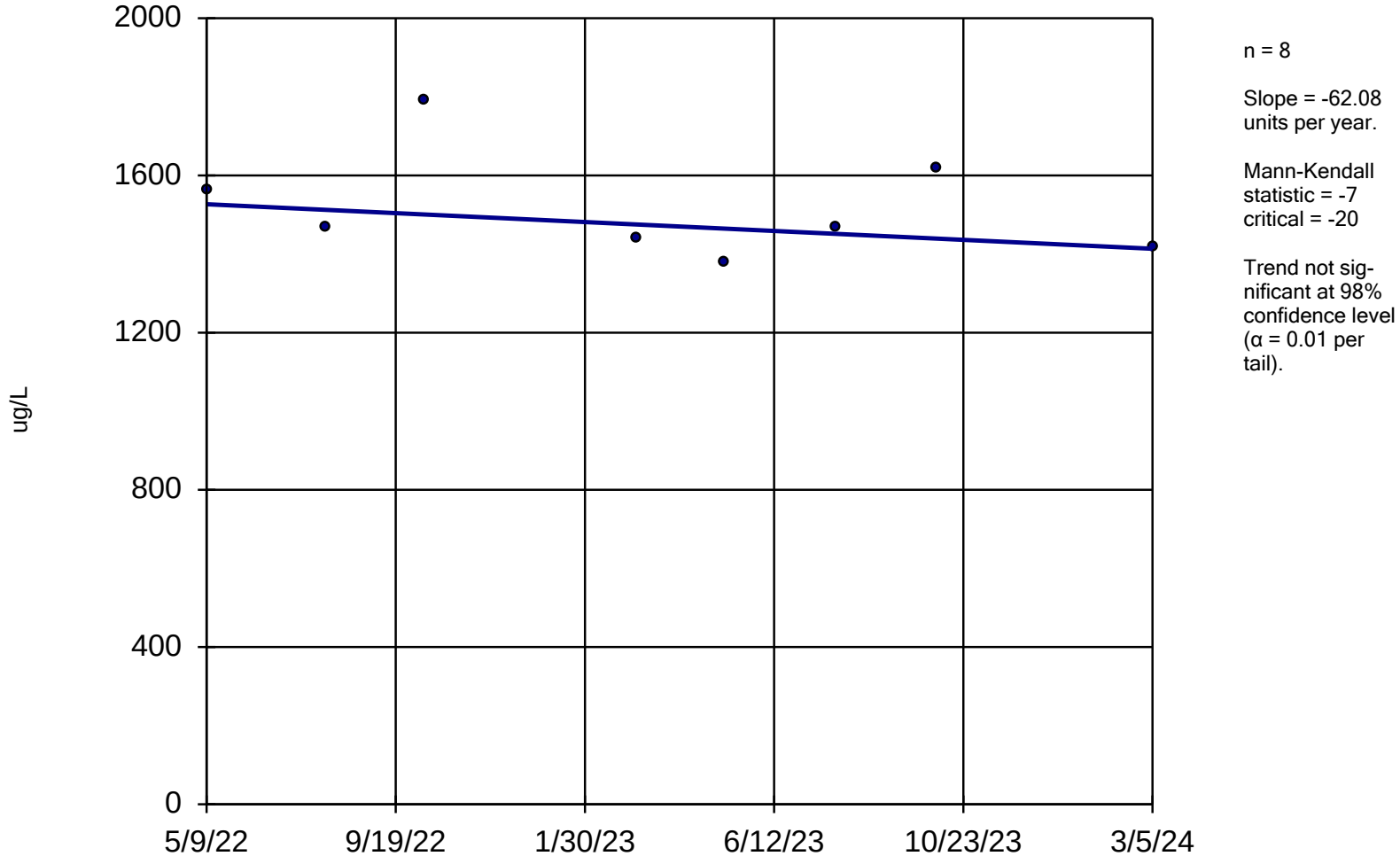
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:50 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

JCW-MW-18001

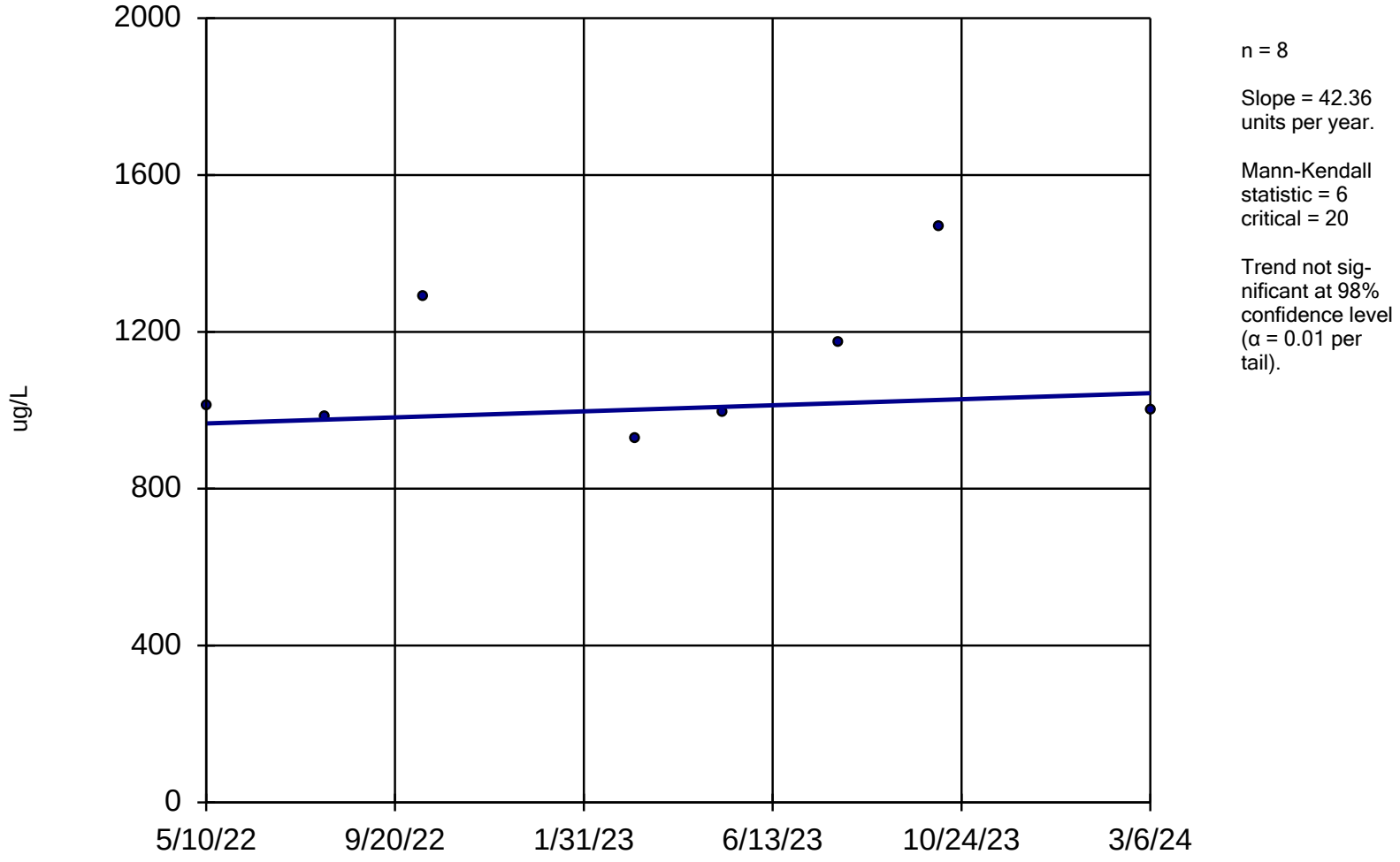


Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

JCW-MW-18005



n = 8

Slope = 42.36 units per year.

Mann-Kendall statistic = 6
critical = 20

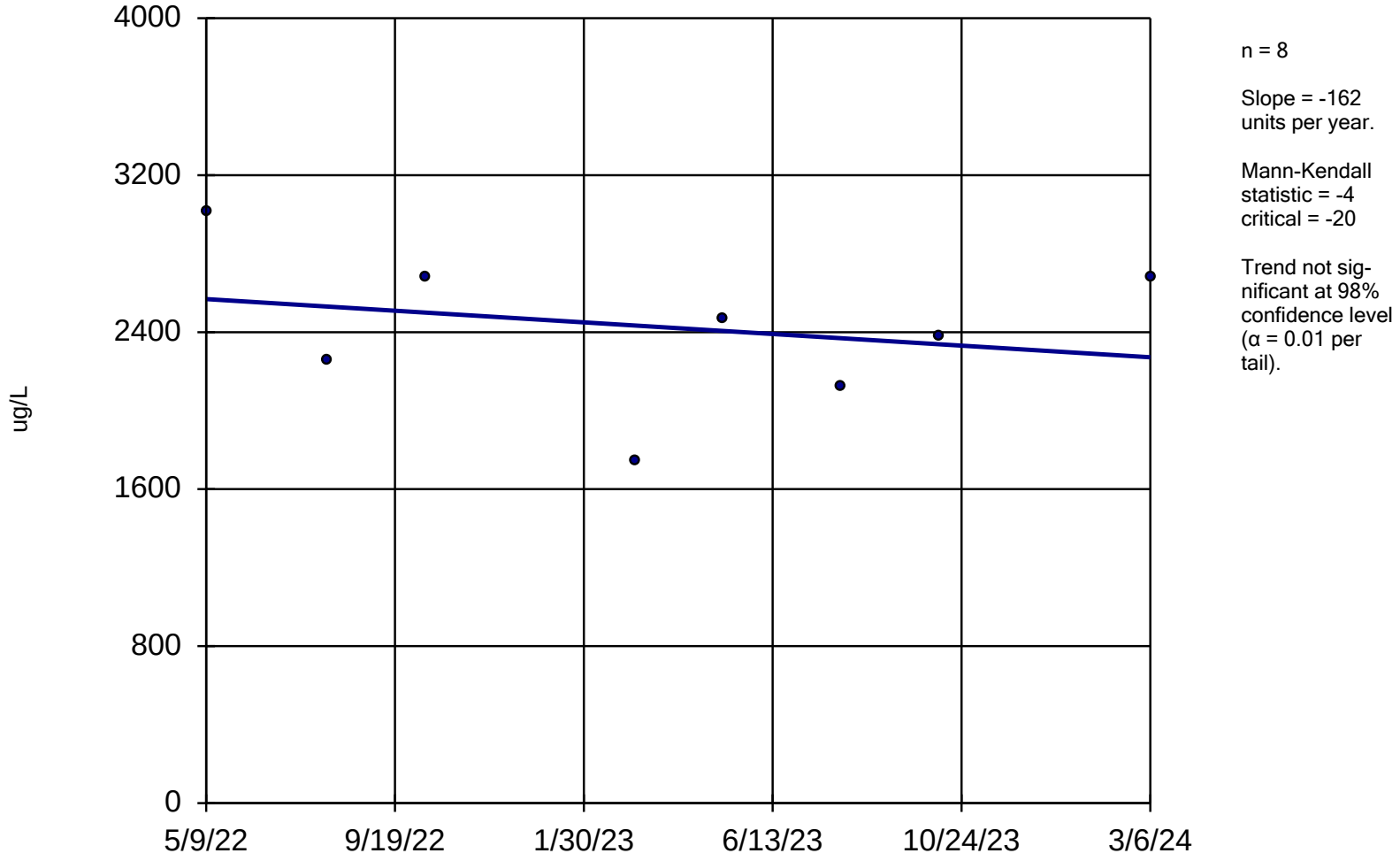
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

JCW-MW-18006

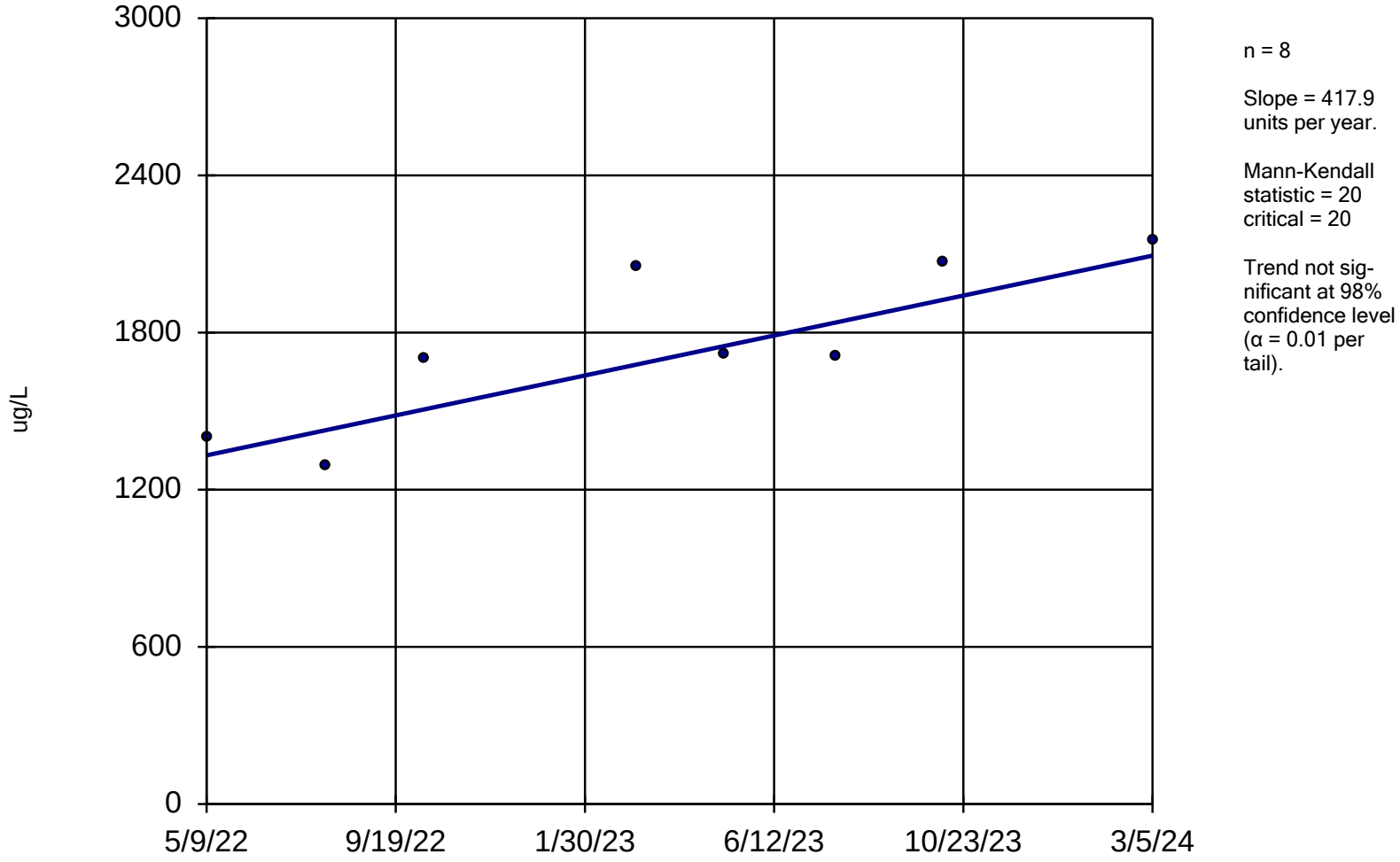


Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-50



n = 8

Slope = 417.9 units per year.

Mann-Kendall statistic = 20
critical = 20

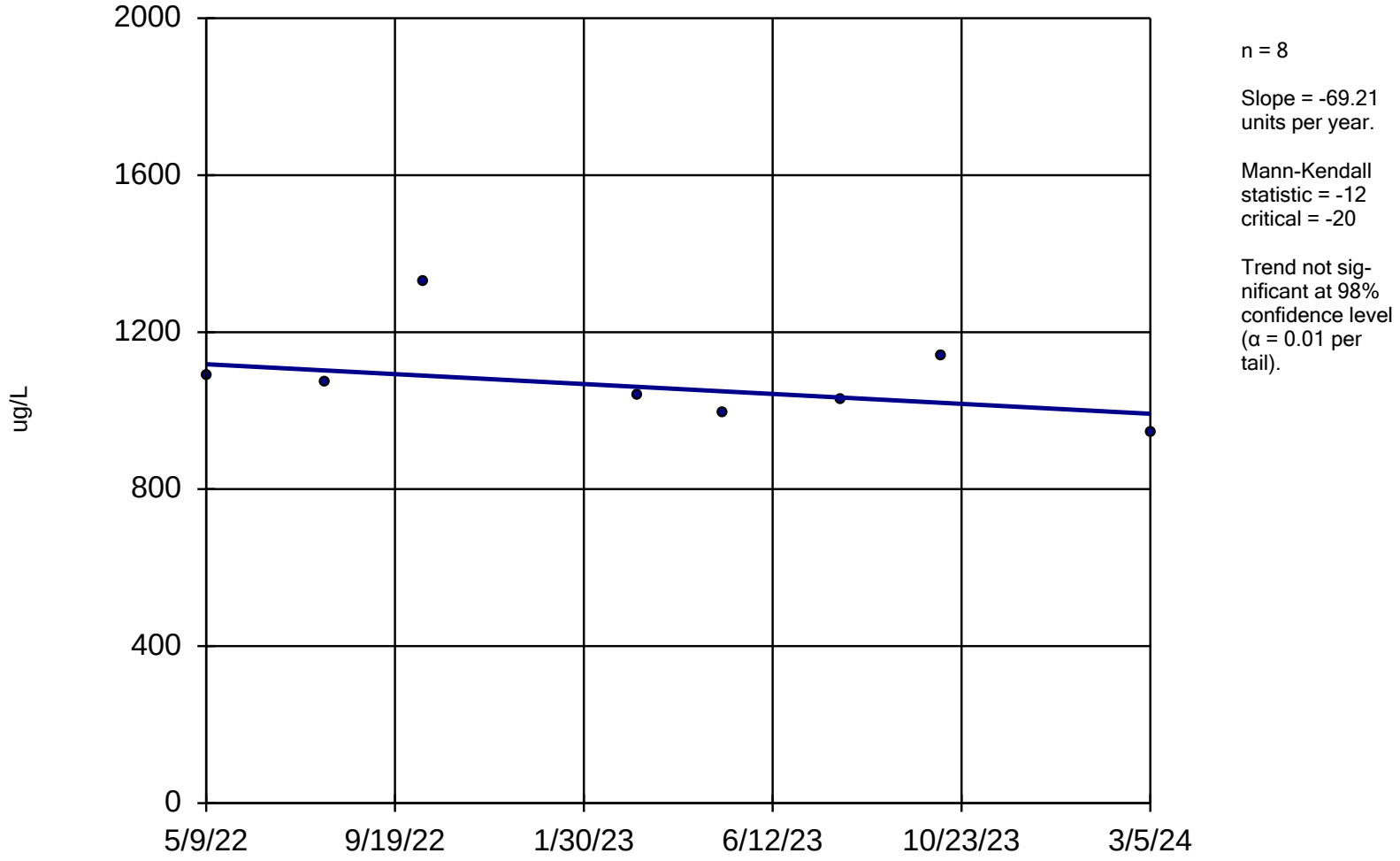
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-52



n = 8

Slope = -69.21 units per year.

Mann-Kendall statistic = -12
critical = -20

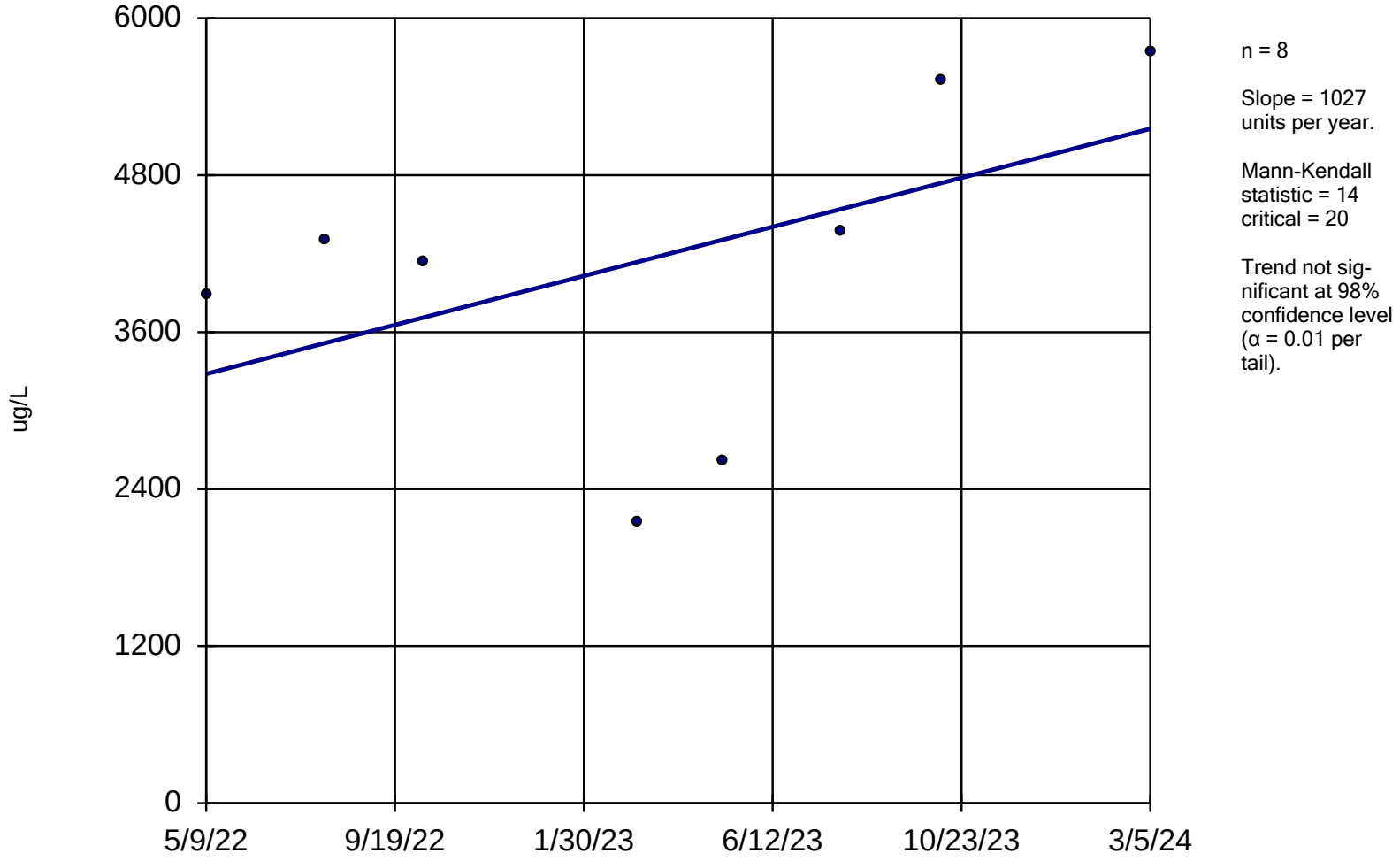
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-53



n = 8

Slope = 1027 units per year.

Mann-Kendall statistic = 14 critical = 20

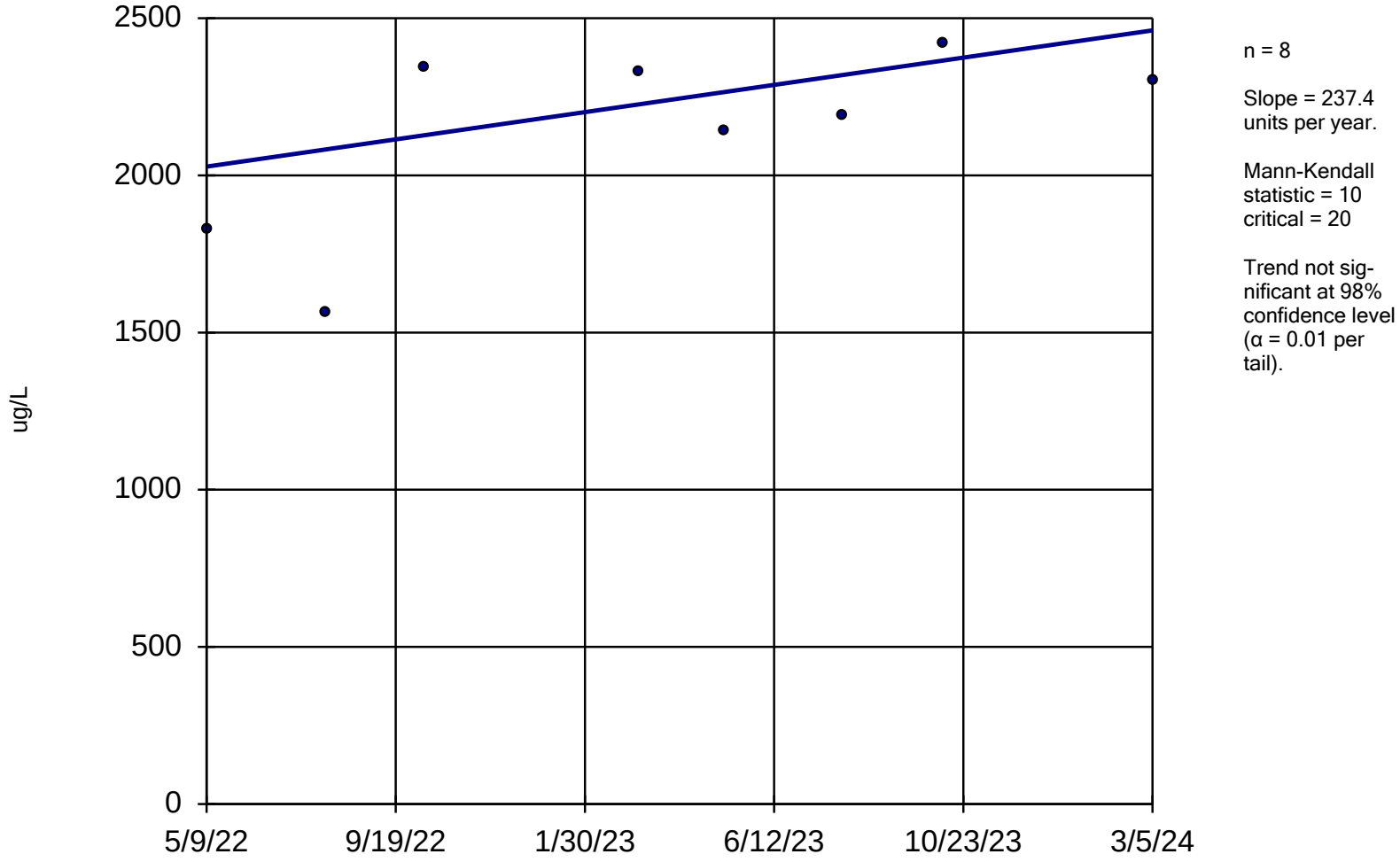
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-53R



n = 8

Slope = 237.4 units per year.

Mann-Kendall statistic = 10
critical = 20

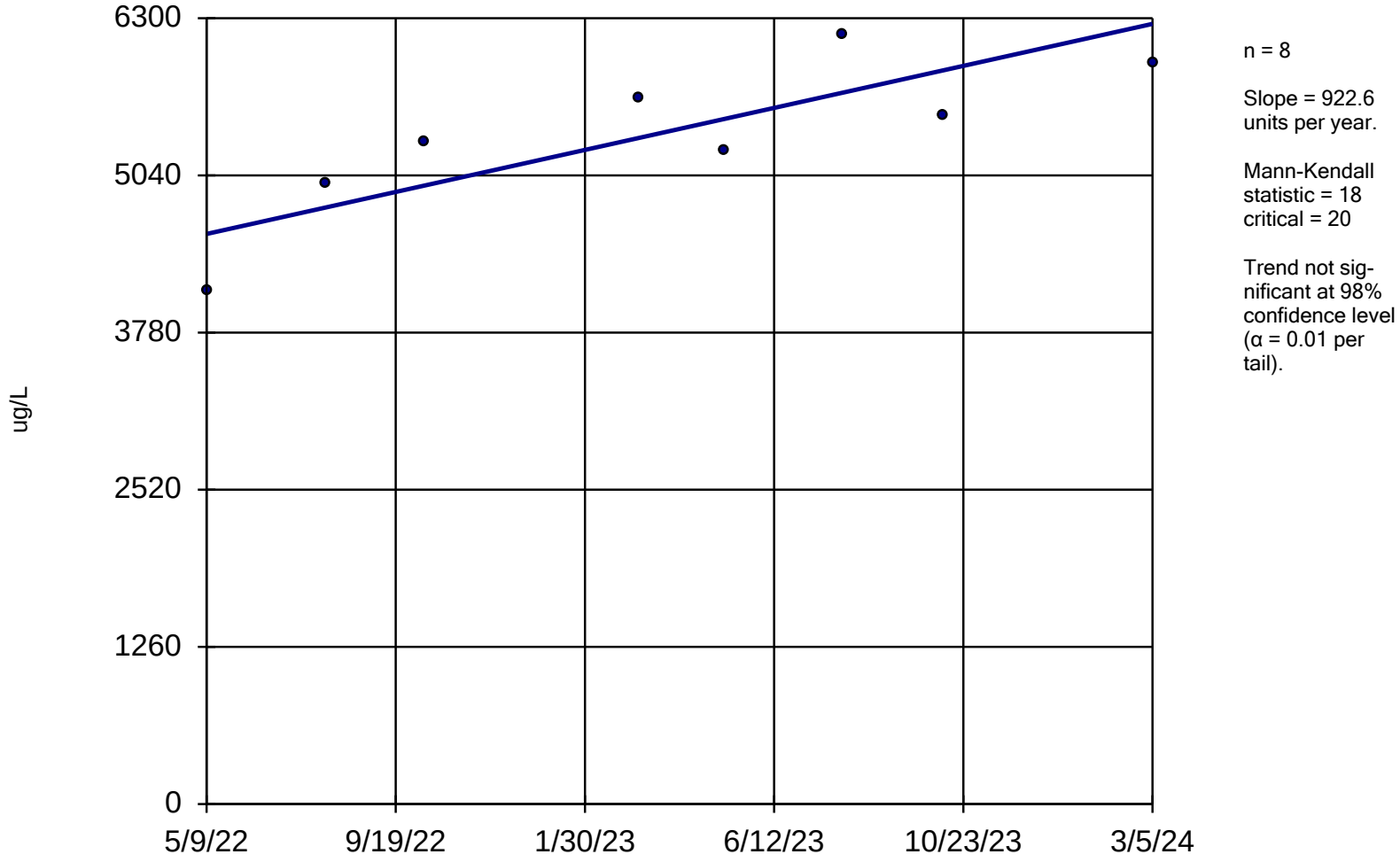
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-54R



n = 8

Slope = 922.6 units per year.

Mann-Kendall statistic = 18
critical = 20

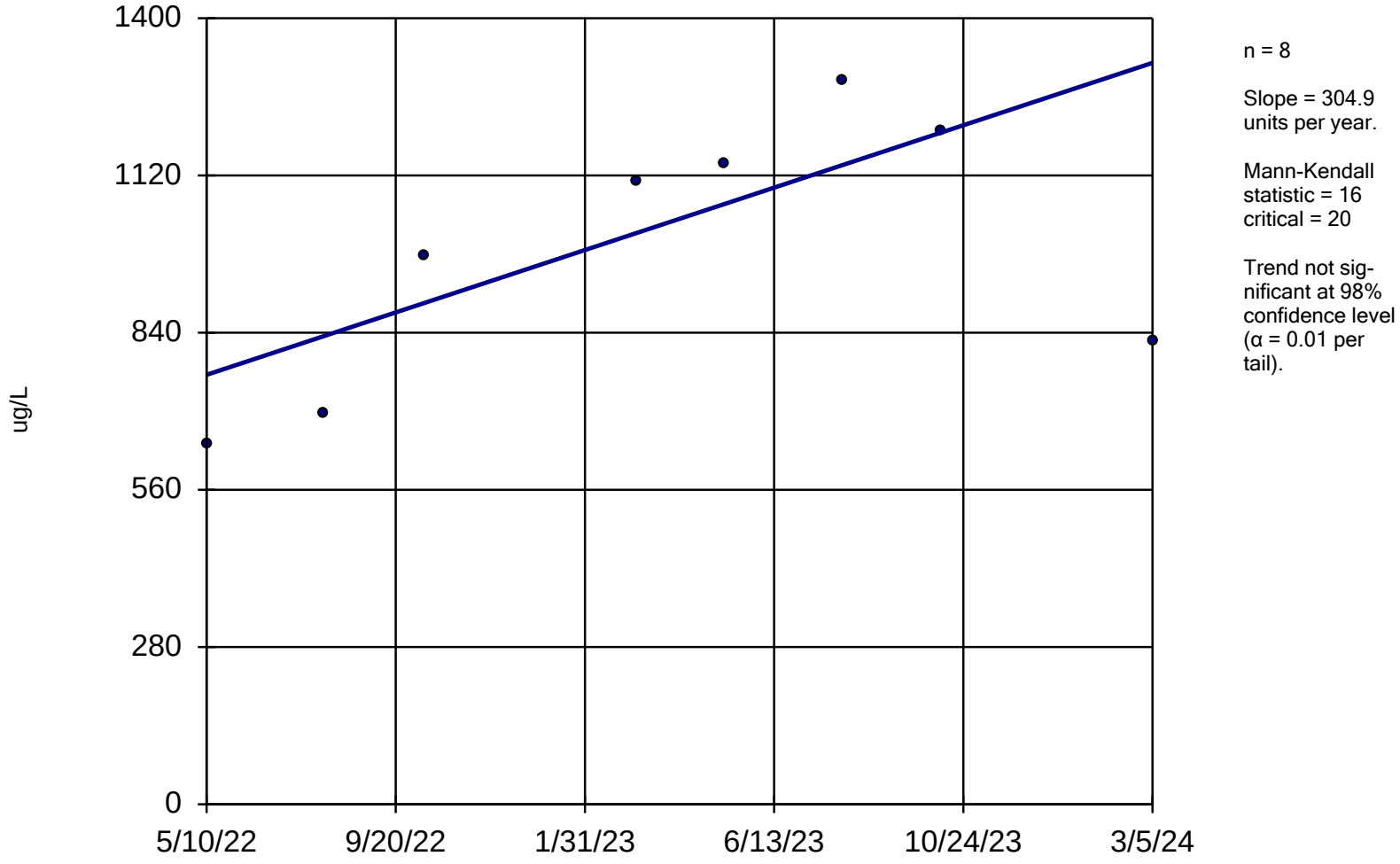
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-55



n = 8

Slope = 304.9 units per year.

Mann-Kendall statistic = 16
critical = 20

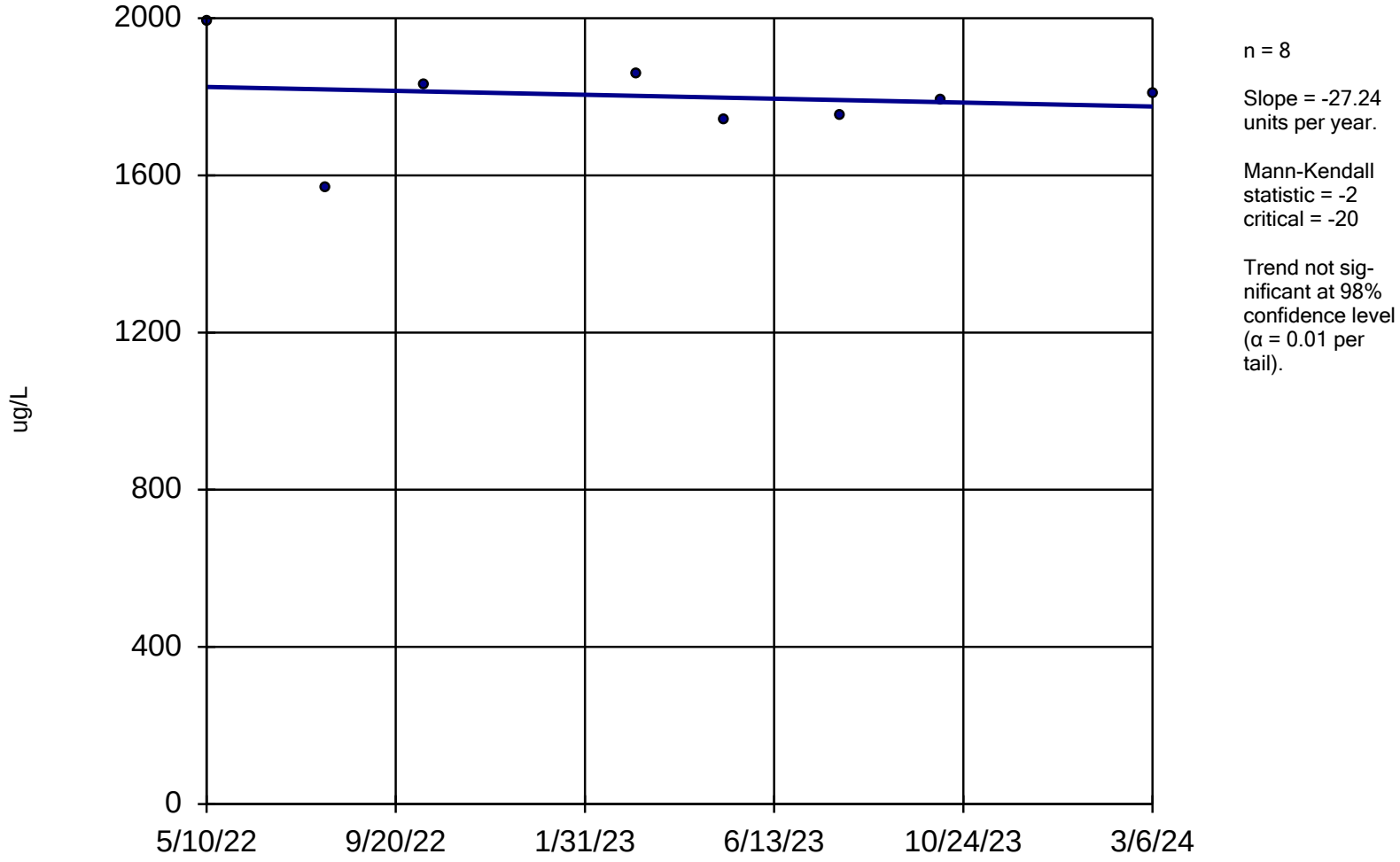
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/10/2024 11:23 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

OW-57ROUT



n = 8

Slope = -27.24 units per year.

Mann-Kendall statistic = -2
critical = -20

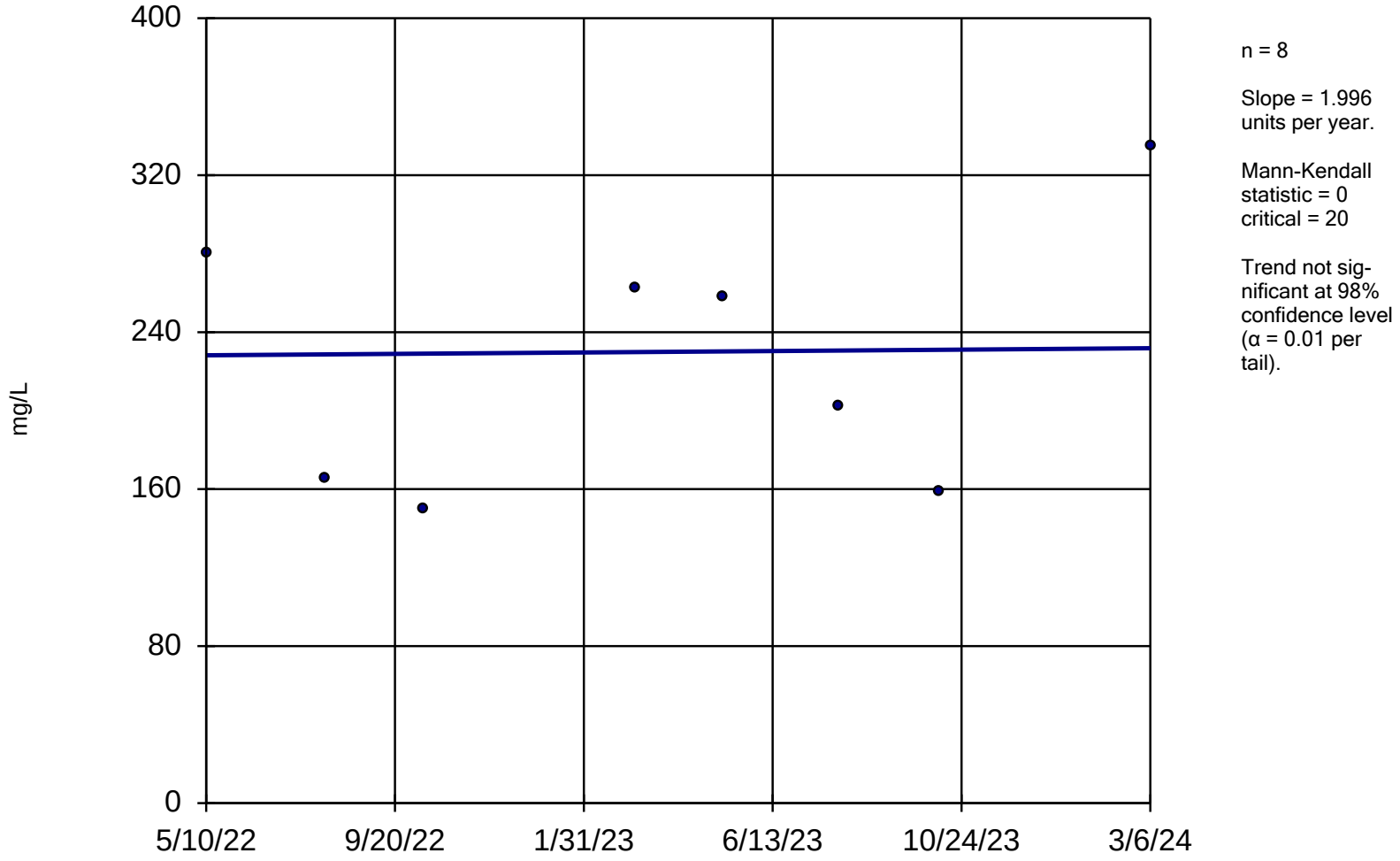
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:58 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Calcium, Total

JCW-MW-18005

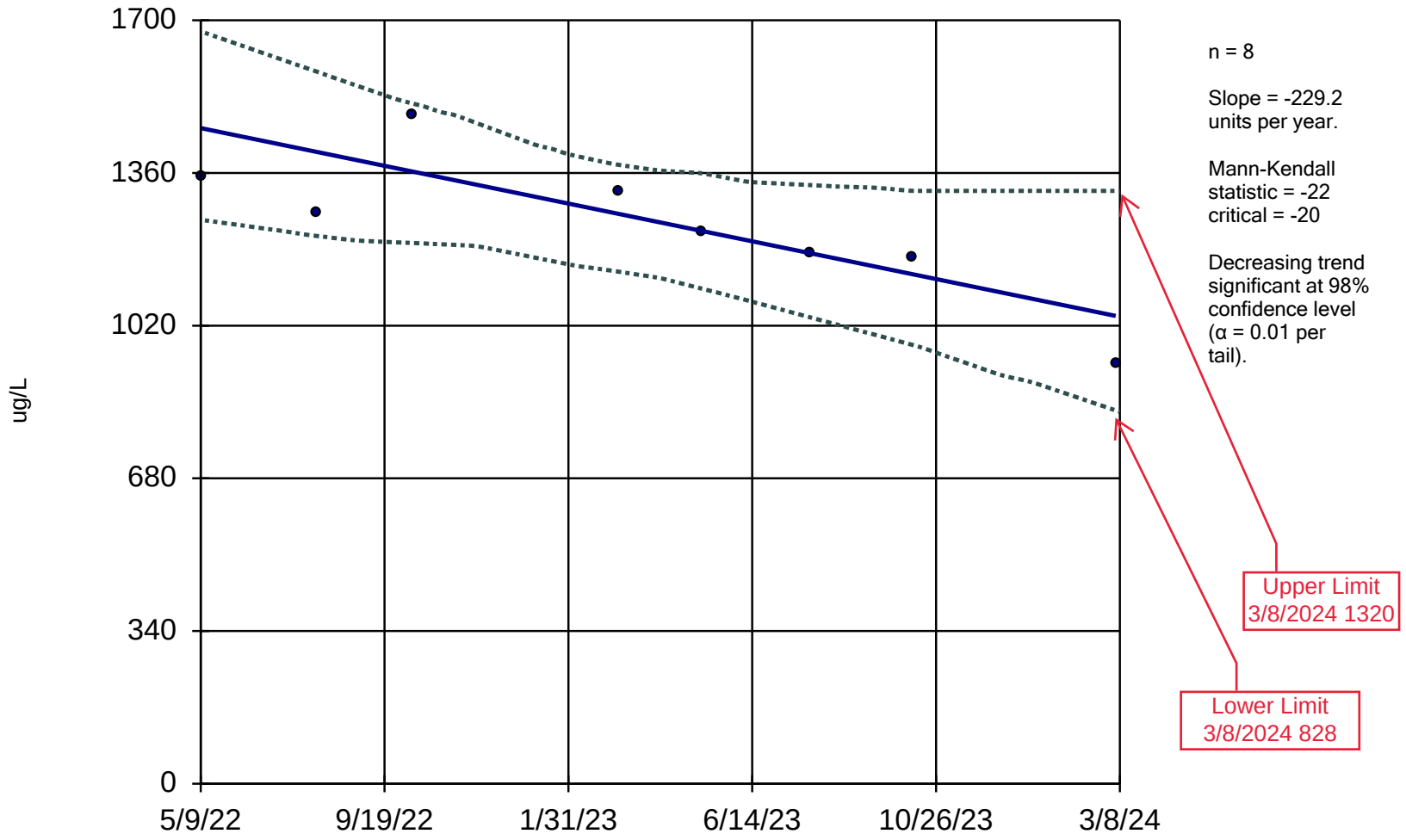


Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 5:59 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Boron, Total

MW-51

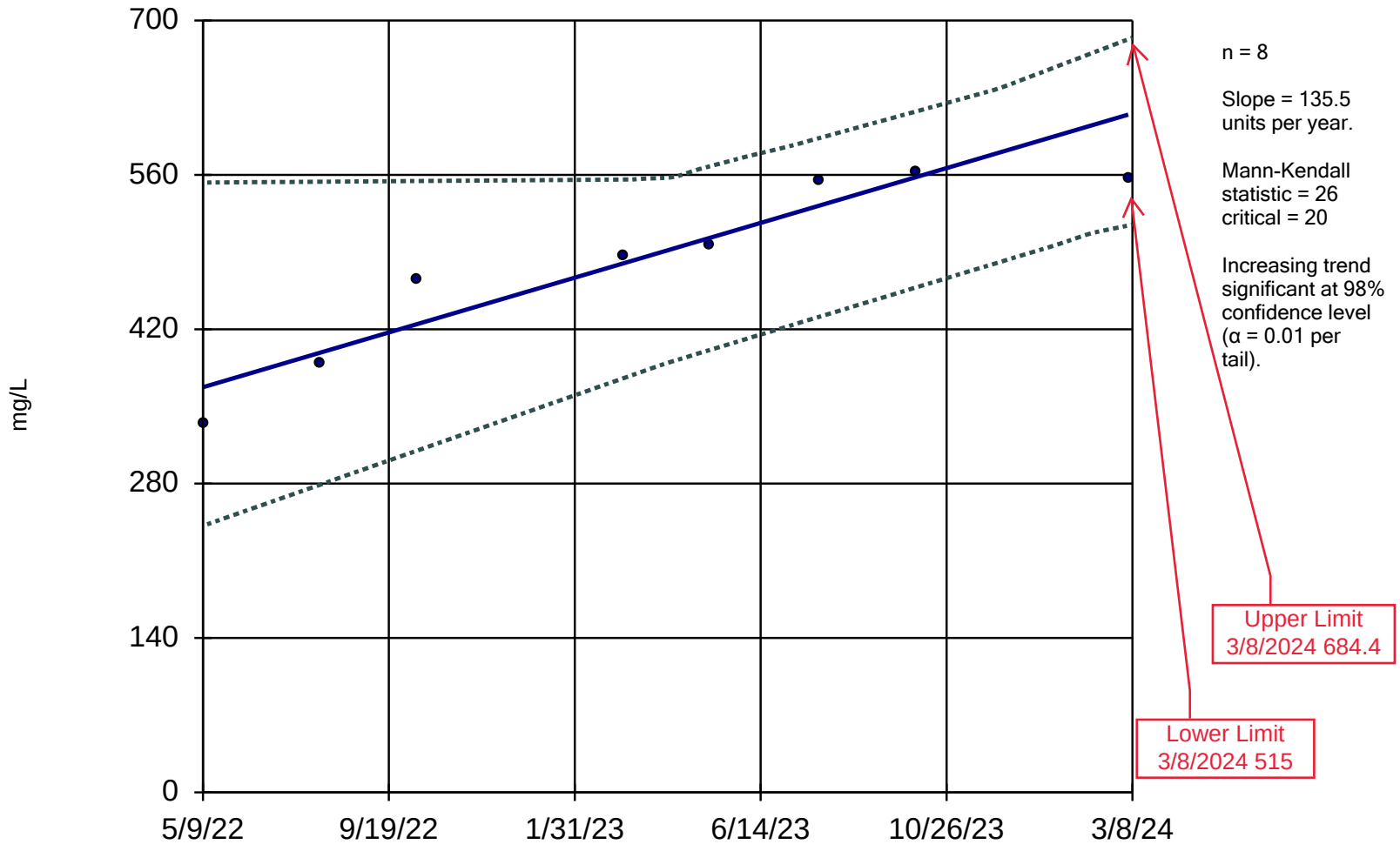


Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 6:02 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Calcium, Total

JCW-MW-18001

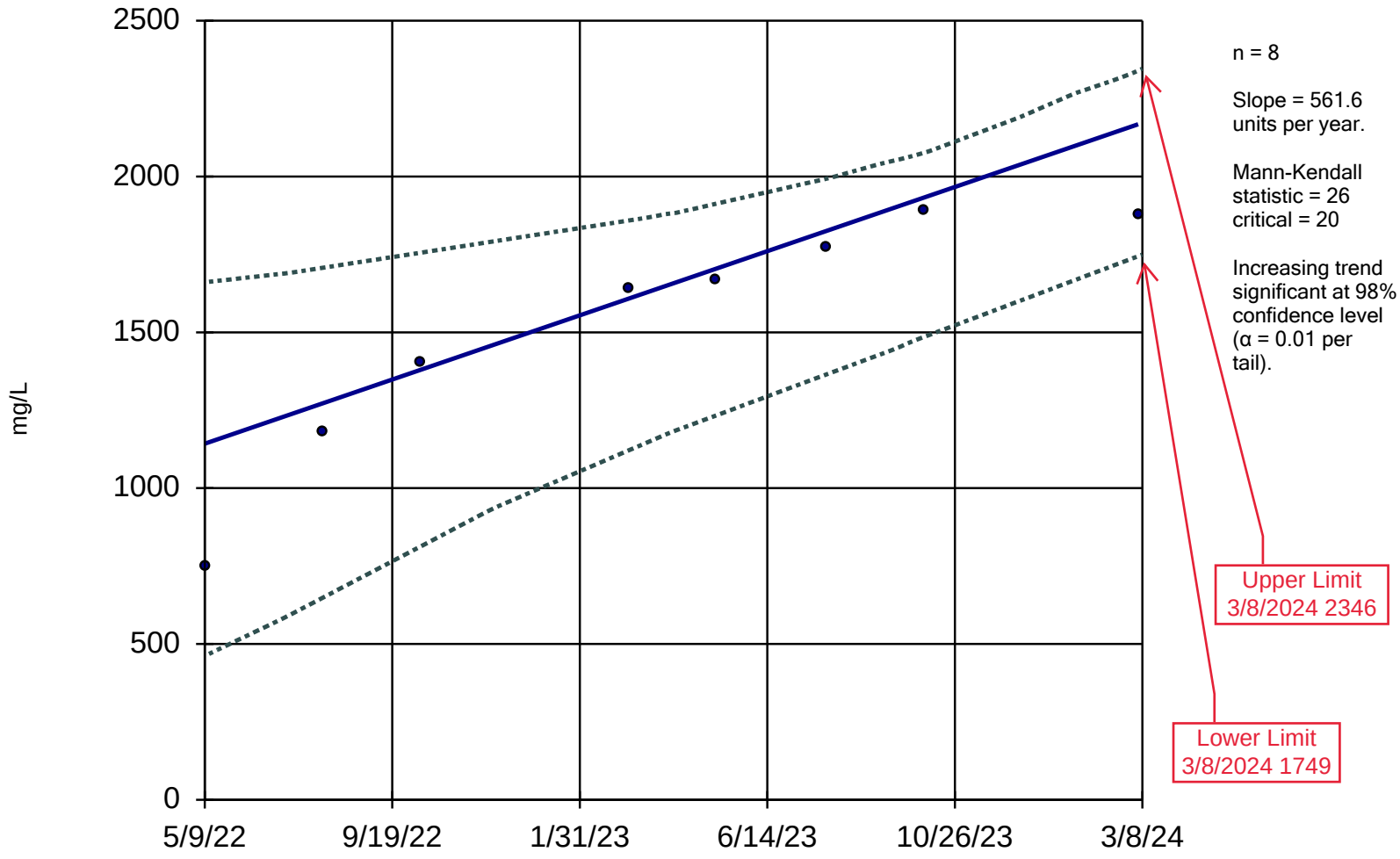


Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 6:05 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Sulfate

JCW-MW-18001

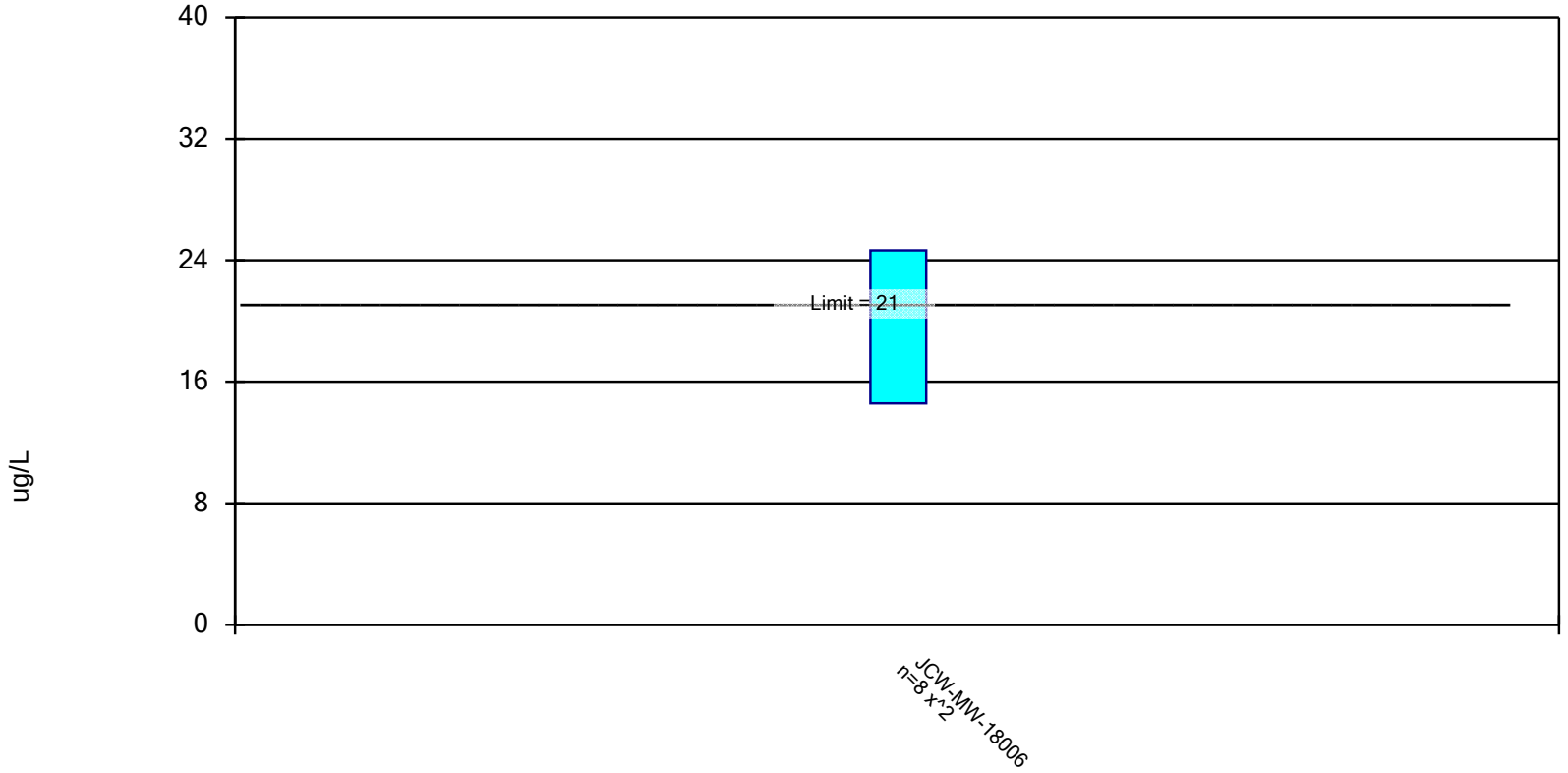


Sen's Slope and 98% Confidence Band Analysis Run 4/8/2024 6:07 PM

Data: JCW_HMPCCR_Sanitas_24Q1

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 4/10/2024 11:31 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Confidence Interval

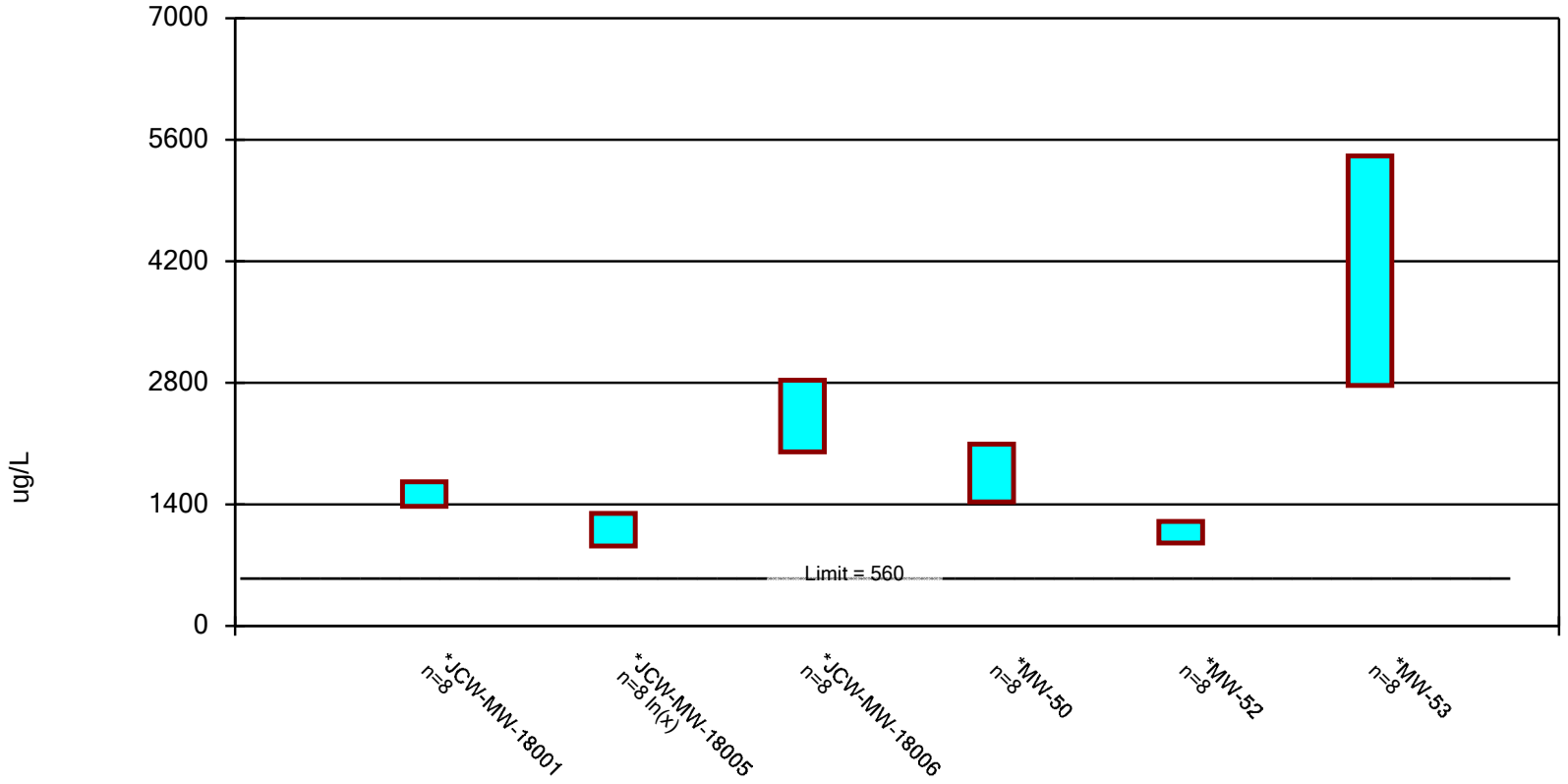
Constituent: Arsenic, Total (ug/L) Analysis Run 4/10/2024 11:37 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

	JCW-MW-18006
5/9/2022	22.5 (D)
8/2/2022	21
10/11/2022	25 (D)
3/9/2023	5 (D)
5/9/2023	23 (D)
7/31/2023	18.5 (D)
10/9/2023	17.5 (D)
3/6/2024	22.5 (D)
Mean	19.38
Std. Dev.	6.301
Upper Lim.	24.65
Lower Lim.	14.58

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron, Total Analysis Run 4/10/2024 11:39 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Confidence Interval

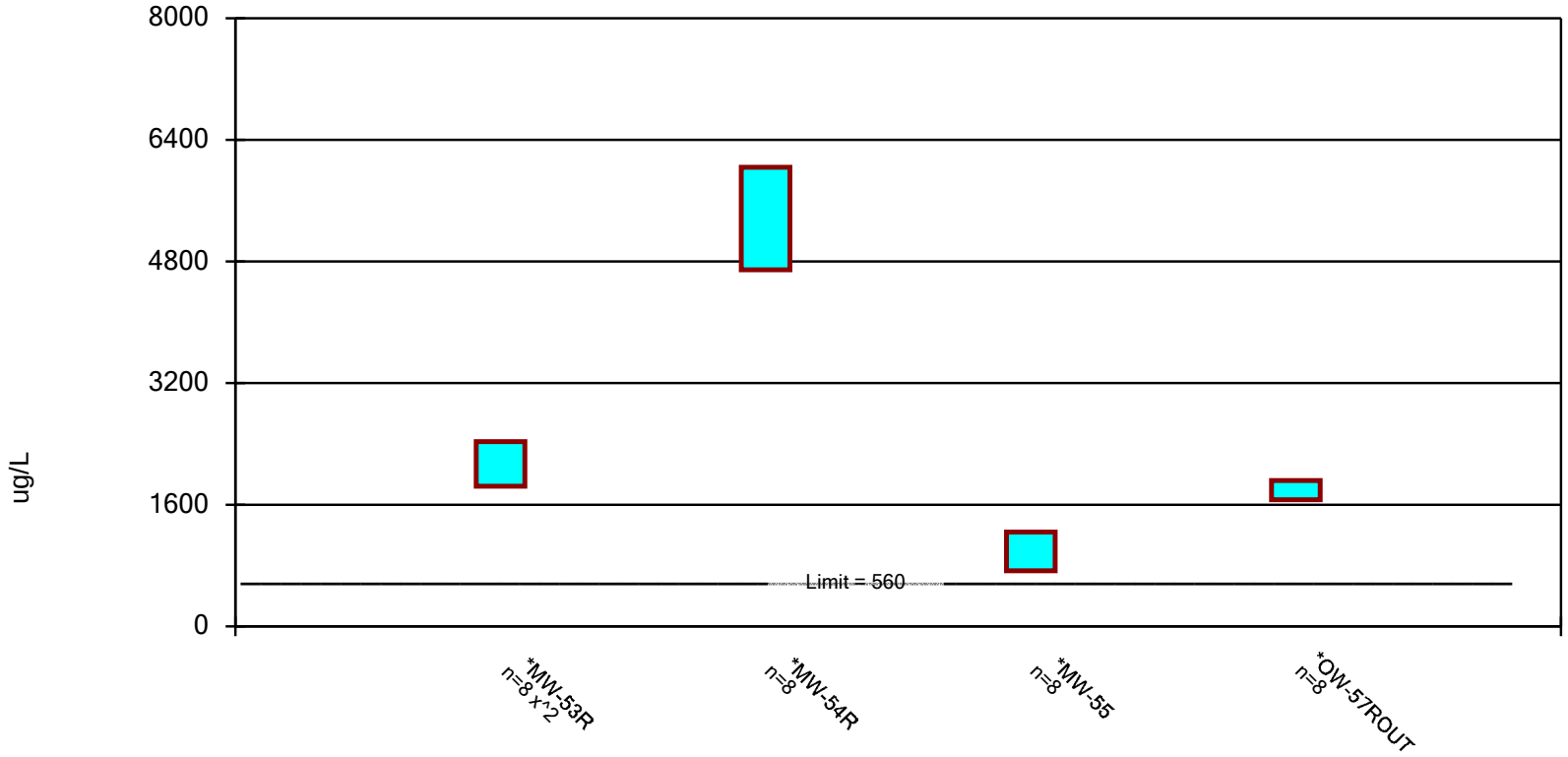
Constituent: Boron, Total (ug/L) Analysis Run 4/10/2024 11:39 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

	JCW-MW-18001	JCW-MW-18005	JCW-MW-18006	MW-50	MW-52	MW-53
5/9/2022	1560		3010 (D)	1400 (D)	1090	3880
5/10/2022		1010				
8/1/2022	1470			1290 (D)	1070	4300
8/2/2022		981	2260			
10/10/2022	1790			1700 (D)	1330	4140
10/11/2022		1290	2685 (D)			
3/8/2023	1440			2050 (D)		
3/9/2023		930	1745 (D)		1040	2150
5/8/2023	1380			1720 (D)	993	2620
5/9/2023		992	2465 (D)			
7/26/2023	1470			1705 (D)		
7/31/2023		1170	2120 (D)		1030	4370
10/5/2023	1620					
10/9/2023		1470	2375 (D)	2065 (D)	1140	5530
3/5/2024	1420			2155 (D)	945	5740
3/6/2024		1000	2675 (D)			
Mean	1519	1105	2417	1761	1080	4091
Std. Dev.	133.9	189.2	388.9	314.4	117.2	1247
Upper Lim.	1661	1296	2829	2094	1204	5413
Lower Lim.	1377	921.1	2005	1427	955.5	2769

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron, Total Analysis Run 4/10/2024 11:39 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Confidence Interval

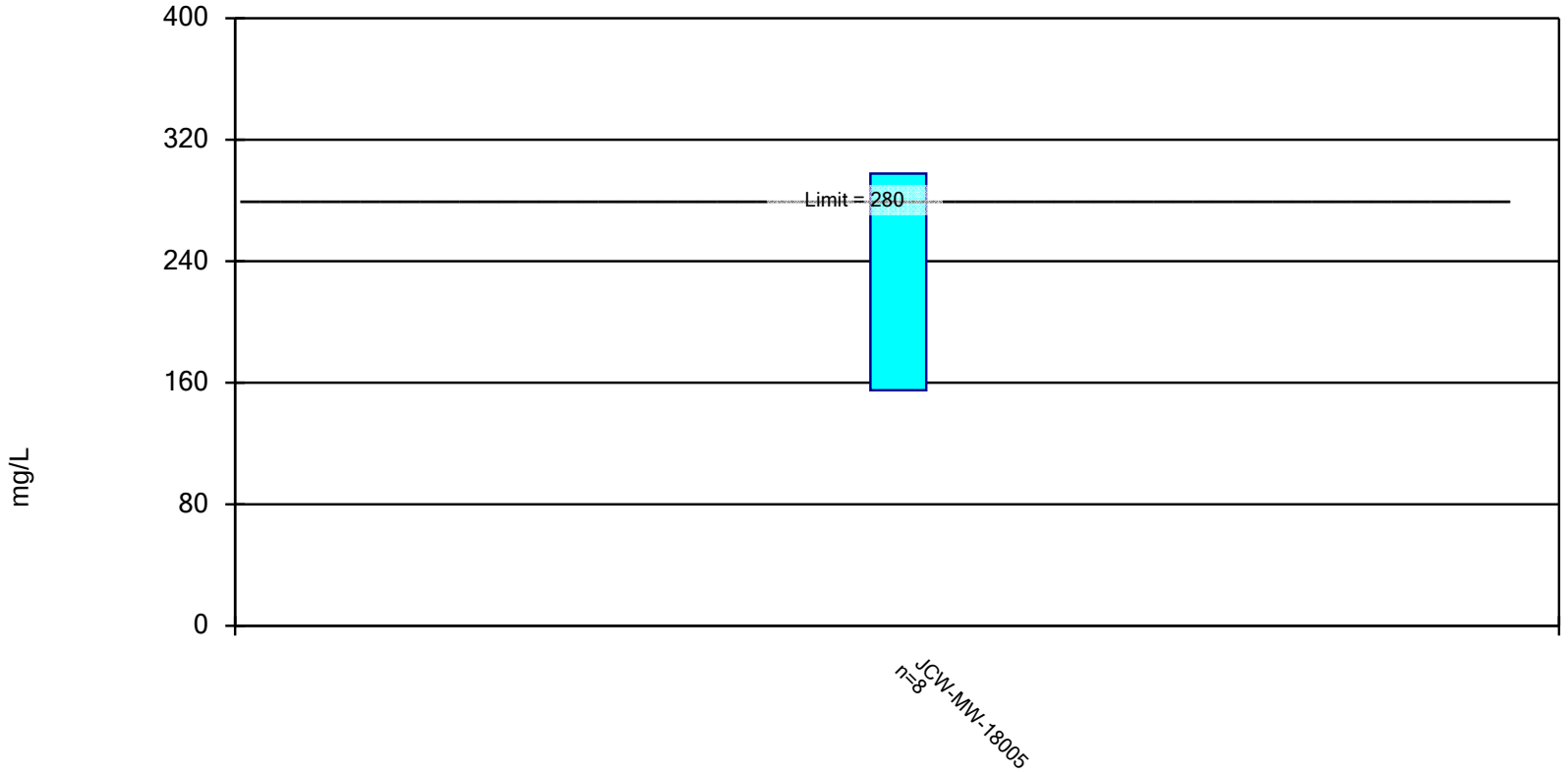
Constituent: Boron, Total (ug/L) Analysis Run 4/10/2024 11:39 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

	MW-53R	MW-54R	MW-55	OW-57ROUT
5/9/2022	1830	4110		
5/10/2022			642	1990
8/1/2022	1560	4970	698 (D)	
8/2/2022				1570
10/10/2022	2340	5310	976	
10/11/2022				1830
3/9/2023	2330	5660	1110	1860
5/8/2023	2140			
5/9/2023		5240	1140	1740
7/31/2023	2190	6170	1290	1750
10/9/2023	2420	5520	1200	1790
3/5/2024	2300	5940	825	
3/6/2024				1810
Mean	2139	5365	985.1	1793
Std. Dev.	296.4	636.9	240.4	119.1
Upper Lim.	2430	6040	1240	1919
Lower Lim.	1843	4690	730.3	1666

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium, Total Analysis Run 4/10/2024 11:41 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q1

Appendix E
Laboratory Analytical Report

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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: March 20, 2024

Subject: HMP GROUNDWATER MONITORING – JCW POREWATER – 2024 Q1

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0132R

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site during the week of 03/04/2024 for the 1st Quarter requirements, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 03/07/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, latest edition.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2024 Weadock Porewater Wells
Date Received: 3/7/2024
Chemistry Project: 24-0132

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0132-01	JCW-MW-18001	Groundwater	03/05/2024 06:37	JCW Solid Waste Disposal Area, Porewater
24-0132-02	JCW-MW-18004	Groundwater	03/05/2024 11:03	JCW Solid Waste Disposal Area, Porewater
24-0132-03	JCW-MW-18005	Groundwater	03/06/2024 07:23	JCW Solid Waste Disposal Area, Porewater
24-0132-04	JCW-MW-18006	Groundwater	03/06/2024 08:57	JCW Solid Waste Disposal Area, Porewater
24-0132-05	MW-50	Groundwater	03/05/2024 08:29	JCW Solid Waste Disposal Area, Porewater
24-0132-06	MW-51	Groundwater	03/05/2024 09:21	JCW Solid Waste Disposal Area, Porewater
24-0132-07	MW-52	Groundwater	03/05/2024 13:50	JCW Solid Waste Disposal Area, Porewater
24-0132-08	MW-53	Groundwater	03/05/2024 13:11	JCW Solid Waste Disposal Area, Porewater
24-0132-09	MW-53R	Groundwater	03/05/2024 12:32	JCW Solid Waste Disposal Area, Porewater
24-0132-10	MW-54R	Groundwater	03/05/2024 11:46	JCW Solid Waste Disposal Area, Porewater
24-0132-11	MW-55	Groundwater	03/05/2024 10:23	JCW Solid Waste Disposal Area, Porewater
24-0132-12	OW-57ROUT	Groundwater	03/06/2024 08:10	JCW Solid Waste Disposal Area, Porewater
24-0132-13	MW-58	Groundwater	03/06/2024 09:24	JCW Solid Waste Disposal Area, Porewater
24-0132-14	DUP-JCW-LF-01	Groundwater	03/05/2024 00:00	JCW Solid Waste Disposal Area, Porewater
24-0132-15	DUP-JCW-LF-02	Groundwater	03/06/2024 00:00	JCW Solid Waste Disposal Area, Porewater
24-0132-16	JCW-MW-18001 MS	Groundwater	03/05/2024 06:37	JCW Solid Waste Disposal Area, Porewater
24-0132-17	JCW-MW-18001 MSD	Groundwater	03/05/2024 06:37	JCW Solid Waste Disposal Area, Porewater
24-0132-18	FB-01	Water	03/06/2024 09:46	JCW Solid Waste Disposal Area, Porewater
24-0132-19	EB-01	Water	03/06/2024 09:43	JCW Solid Waste Disposal Area, Porewater

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18001**
Lab Sample ID: 24-0132-01
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 06:37 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	49		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	1420		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	557000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	3		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	3570		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	106		ug/L	10.0	03/11/2024	AB24-0311-03
Magnesium	138000		ug/L	1000.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	14		ug/L	2.0	03/11/2024	AB24-0311-03
Potassium	17400		ug/L	100.0	03/11/2024	AB24-0311-03
Selenium	2		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Sodium	231000		ug/L	1000.0	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	3		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-01-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	44700		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	1880000		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-01-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	3450		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18001**
Lab Sample ID: 24-0132-01
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 06:37 AM

Alkalinity by SM 2320B

Aliquot #: 24-0132-01-C04-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	717000		ug/L	10000.0	03/07/2024	AB24-0308-12
Alkalinity Bicarbonate	717000		ug/L	10000.0	03/07/2024	AB24-0308-12
Alkalinity Carbonate	ND		ug/L	10000.0	03/07/2024	AB24-0308-12

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18004**
Lab Sample ID: 24-0132-02
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 11:03 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	26		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	192		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	238000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	98		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	43		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	4		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-02-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-02-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	16900		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	557000		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-02-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1250		mg/L	10.0	03/07/2024	AB24-0308-02

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18005**
Lab Sample ID: 24-0132-03
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 07:23 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	3		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	136		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	1000		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	335000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	7		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	4020		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	43		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	2		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-03-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-03-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	23300		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	512000		ug/L	1000.0	03/12/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-03-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1400		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18006**
Lab Sample ID: 24-0132-04
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 08:57 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	22		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	445		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	2650		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	137000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	7970		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	52		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	5		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	3		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	4		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-04-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-04-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	61300		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	69700		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-04-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	748		mg/L	10.0	03/07/2024	AB24-0308-02

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-50**
Lab Sample ID: 24-0132-05
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 08:29 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	3		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	187		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	2170		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	199000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	889		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	69		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	6		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	8		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	3		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-05-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-05-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	40100		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	449000		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-05-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1180		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-51**
Lab Sample ID: 24-0132-06
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 09:21 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	10		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	127		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	935		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	132000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	446		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	31		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	2		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-06-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-06-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	78300		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	266000		ug/L	1000.0	03/10/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-06-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	902		mg/L	10.0	03/07/2024	AB24-0308-02

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-52**
Lab Sample ID: 24-0132-07
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 01:50 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	94		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	945		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	237000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	3120		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	27		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	2		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-07-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-07-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	33800		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	540000		ug/L	1000.0	03/10/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-07-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1380		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-53**
Lab Sample ID: 24-0132-08
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 01:11 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	1		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	654		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	5740		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	134000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	947		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	50		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	3		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	2		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-08-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-08-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	77400		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	25400		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-08-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	694		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-53R**
Lab Sample ID: 24-0132-09
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 12:32 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	9		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	165		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	2300		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	173000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	752		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	56		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	2		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-09-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-09-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	34700		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	53200		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-09-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	862		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-54R**
Lab Sample ID: 24-0132-10
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 11:46 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	1		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	97		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	5940		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	170000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	159		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	76		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	15		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	3		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-10-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-10-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	61700		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	48600		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-10-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	752		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-55**
Lab Sample ID: 24-0132-11
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 10:23 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-11-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	46		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	260		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	825		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	166000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	18700		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	26		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	27		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-11-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-11-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	18300		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	224000		ug/L	1000.0	03/12/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-11-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	866		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **OW-57ROUT**
Lab Sample ID: 24-0132-12
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 08:10 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-12-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	1		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	81		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	1810		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	123000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	2		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	44		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	28		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	6		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	12		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-12-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-12-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	68100		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	1230		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	79300		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-12-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	770		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-58**
Lab Sample ID: 24-0132-13
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 09:24 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-13-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	5		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	162		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	98		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	119000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	17700		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	23		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	4		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	8		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-13-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-13-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	518000		ug/L	1000.0	03/10/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	27800		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-13-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1230		mg/L	10.0	03/07/2024	AB24-0308-02

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **DUP-JCW-LF-01**
Lab Sample ID: 24-0132-14
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-14-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	3		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	179		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	2140		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	196000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	930		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	68		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	6		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	8		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	3		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-14-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-14-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	38600		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	448000		ug/L	1000.0	03/10/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-14-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1190		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **DUP-JCW-LF-02**
Lab Sample ID: 24-0132-15
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-15-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	23		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	464		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	2700		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	136000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	2		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	7890		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	54		ug/L	10.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	9		ug/L	2.0	03/11/2024	AB24-0311-03
Selenium	3		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	4		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-15-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-15-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	64700		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	71600		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0132-15-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	776		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18001 MS**
Lab Sample ID: 24-0132-16
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 06:37 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-16-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	111		%	1.0	03/11/2024	AB24-0311-03
Arsenic	107		%	1.0	03/11/2024	AB24-0311-03
Barium	111		%	5.0	03/11/2024	AB24-0311-03
Beryllium	96		%	1.0	03/11/2024	AB24-0311-03
Boron	100		%	20.0	03/11/2024	AB24-0311-03
Cadmium	108		%	0.2	03/11/2024	AB24-0311-03
Calcium	120		%	1000.0	03/11/2024	AB24-0311-03
Chromium	106		%	1.0	03/11/2024	AB24-0311-03
Cobalt	100		%	6.0	03/11/2024	AB24-0311-03
Copper	90		%	1.0	03/11/2024	AB24-0311-03
Iron	116		%	20.0	03/11/2024	AB24-0311-03
Lead	94		%	1.0	03/11/2024	AB24-0311-03
Lithium	98		%	10.0	03/11/2024	AB24-0311-03
Magnesium	118		%	1000.0	03/11/2024	AB24-0311-03
Molybdenum	111		%	5.0	03/11/2024	AB24-0311-03
Nickel	96		%	2.0	03/11/2024	AB24-0311-03
Potassium	110		%	100.0	03/11/2024	AB24-0311-03
Selenium	103		%	1.0	03/11/2024	AB24-0311-03
Silver	96.5		%	0.2	03/11/2024	AB24-0311-03
Sodium	120		%	1000.0	03/11/2024	AB24-0311-03
Thallium	96		%	2.0	03/11/2024	AB24-0311-03
Vanadium	112		%	2.0	03/11/2024	AB24-0311-03
Zinc	97		%	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-16-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	96.0		%	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-16-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	107		%	1000.0	03/09/2024	AB24-0308-01
Fluoride	99		%	1000.0	03/09/2024	AB24-0308-01
Sulfate	114		%	1000.0	03/09/2024	AB24-0308-01

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18001 MSD**
Lab Sample ID: 24-0132-17
Matrix: Groundwater

Laboratory Project: **24-0132**
Collect Date: 03/05/2024
Collect Time: 06:37 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-17-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	111		%	1.0	03/11/2024	AB24-0311-03
Arsenic	107		%	1.0	03/11/2024	AB24-0311-03
Barium	113		%	5.0	03/11/2024	AB24-0311-03
Beryllium	99		%	1.0	03/11/2024	AB24-0311-03
Boron	104		%	20.0	03/11/2024	AB24-0311-03
Cadmium	110		%	0.2	03/11/2024	AB24-0311-03
Calcium	110		%	1000.0	03/11/2024	AB24-0311-03
Chromium	108		%	1.0	03/11/2024	AB24-0311-03
Cobalt	102		%	6.0	03/11/2024	AB24-0311-03
Copper	92		%	1.0	03/11/2024	AB24-0311-03
Iron	119		%	20.0	03/11/2024	AB24-0311-03
Lead	95		%	1.0	03/11/2024	AB24-0311-03
Lithium	99		%	10.0	03/11/2024	AB24-0311-03
Magnesium	113		%	1000.0	03/11/2024	AB24-0311-03
Molybdenum	115		%	5.0	03/11/2024	AB24-0311-03
Nickel	98		%	2.0	03/11/2024	AB24-0311-03
Potassium	107		%	100.0	03/11/2024	AB24-0311-03
Selenium	107		%	1.0	03/11/2024	AB24-0311-03
Silver	98.1		%	0.2	03/11/2024	AB24-0311-03
Sodium	116		%	1000.0	03/11/2024	AB24-0311-03
Thallium	97		%	2.0	03/11/2024	AB24-0311-03
Vanadium	111		%	2.0	03/11/2024	AB24-0311-03
Zinc	96		%	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-17-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	98.0		%	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-17-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	108		%	1000.0	03/09/2024	AB24-0308-01
Fluoride	99		%	1000.0	03/09/2024	AB24-0308-01
Sulfate	106		%	1000.0	03/09/2024	AB24-0308-01

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **FB-01**
Lab Sample ID: 24-0132-18
Matrix: Water

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 09:46 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-18-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	ND		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	ND		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	ND		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	ND		ug/L	10.0	03/11/2024	AB24-0311-03
Magnesium	ND		ug/L	1000.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Potassium	ND		ug/L	100.0	03/11/2024	AB24-0311-03
Selenium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Sodium	ND		ug/L	1000.0	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-18-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-18-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	ND		ug/L	1000.0	03/09/2024	AB24-0308-01

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **EB-01**
Lab Sample ID: 24-0132-19
Matrix: Water

Laboratory Project: **24-0132**
Collect Date: 03/06/2024
Collect Time: 09:43 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0132-19-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	ND		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	ND		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	ND		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	ND		ug/L	10.0	03/11/2024	AB24-0311-03
Magnesium	ND		ug/L	1000.0	03/11/2024	AB24-0311-03
Molybdenum	ND		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Potassium	ND		ug/L	100.0	03/11/2024	AB24-0311-03
Selenium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Sodium	ND		ug/L	1000.0	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0132-19-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0132-19-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	ND		ug/L	1000.0	03/09/2024	AB24-0308-01

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0132

Inspection Date: 3/7/24 **Inspection By:** CLE | LMO

Sample Origin/Project Name: 01-2024 Wradock Porewater

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 271836829698 Shipping Form Attached: Yes ✓ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 0.4 - 2.0 °C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015402 5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	4				
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	36				
24 mL vial (glass)					
500 mL (plastic)					
Other 250 mL plastic	Ice				

pH paper Lot # 205522 Exp. 2.15.25

PG. 2 of 2 not needed

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q1-2024 Weadock Porewater Wells

PROJECT NUMBER: **24-0132**

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	Alkalinity						REMARKS
24-0132-01	3/5/24	0637	GW	JCW-MW-18001	5	4	1						x	x	x	x						
-02	3/5/24	1103	GW	JCW-MW-18004	3	2	1						x	x	x							
-03	3/6/24	0727	GW	JCW-MW-18005	3	2	1						x	x	x							
-04	3/6/24	0857	GW	JCW-MW-18006	3	2	1						x	x	x							
-05	3/5/24	0831	GW	MW-50	3	2	1						x	x	x							
-06	3/5/24	0921	GW	MW-51	3	2	1						x	x	x							
-07	3/5/24	1350	GW	MW-52	3	2	1						x	x	x							
-08	3/5/24	1311	GW	MW-53	3	2	1						x	x	x							
-09	3/5/24	1232	GW	MW-53R	3	2	1						x	x	x							
-10	3/5/24	1146	GW	MW-54R	3	2	1						x	x	x							
-11	3/5/24	1023	GW	MW-55	3	2	1						x	x	x							
-12	3/6/24	0810	GW	OW-57ROUT	3	2	1						x	x	x							

RELINQUISHED BY: — DATE/TIME: 3/6/24 1541 — RECEIVED BY: Fed Ex

RELINQUISHED BY: Fed Ex — DATE/TIME: 03/07/24 0945 — RECEIVED BY:

SB 032424

COMMENTS:

Received on Ice? ☑ Yes ☐ No — M&TE #: 015402

Temperature: 0.4-2.0 °C — Cal. Due Date: 05-23-24

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135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q1-2024 Weadock Porewater Wells

PROJECT NUMBER: **24-0132**

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	Alkalinity	REMARKS
24-0132-13	3/4/24	0924	GW	MW-58	3	2	1						x	x	x		
-14	3/5/24	—	GW	DUP-JCW-LF-01	3	2	1						x	x	x		
-15	3/4/24	—	GW	DUP-JCW-LF-02	3	2	1						x	x	x		
-16	3/5/24	0637	GW	JCW-MW-18001 MS	2	1	1						x	x			
-17	" "	0637	GW	JCW-MW-18001 MSD	2	1	1						x	x			
-18	3/4/24	0946	W	FB-01	2	1	1						x	x			
-19	3/4/24	0943	W	EB-01	2	1	1						x	x			

RELINQUISHED BY: 3/6/24 — DATE/TIME: 0545 — RECEIVED BY: Fed Ex

RELINQUISHED BY: Fed Ex — DATE/TIME: 03/06/24 07 2B032124 — RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No — M&TE #: 015402

Temperature: 0.4-2.0 °C — Cal. Due Date: 05-23-24

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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: March 20, 2024

Subject: RCRA GROUNDWATER MONITORING – DEK-JCW BACKGROUND WELLS – 2024 Q1

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0131R

TRC Environmental, Inc. conducted groundwater monitoring at the Karn/Weadock Background Wells area during the week of 03/04/2024 for the 1st Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 03/07/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative, or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section, when applicable; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2024 DEK-JCW Background Wells
Date Received: 3/7/2024
Chemistry Project: 24-0131

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0131-01	MW-15002	Groundwater	03/05/2024 10:52	DEK JCW Background
24-0131-02	MW-15008	Groundwater	03/05/2024 09:19	DEK JCW Background
24-0131-03	MW-15016	Groundwater	03/05/2024 11:40	DEK JCW Background
24-0131-04	MW-15019	Groundwater	03/05/2024 10:00	DEK JCW Background
24-0131-05	DUP-Background	Groundwater	03/05/2024 00:00	DEK JCW Background
24-0131-06	FB- Background	Water	03/05/2024 00:00	DEK JCW Background

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Analytical Report

Report Date: 03/20/24
04/15/24R

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15002**
Lab Sample ID: 24-0131-01
Matrix: Groundwater

Laboratory Project: **24-0131**
Collect Date: 03/05/2024R
Collect Time: 10:52 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0131-01-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0131-01-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Arsenic	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Barium	474		ug/L	5.0	03/13/2024	AB24-0313-01
Beryllium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Boron	116		ug/L	20.0	03/13/2024	AB24-0313-01
Cadmium	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Calcium	175000		ug/L	1000.0	03/13/2024	AB24-0313-01
Chromium	1		ug/L	1.0	03/13/2024	AB24-0313-01
Cobalt	ND		ug/L	6.0	03/13/2024	AB24-0313-01
Copper	2		ug/L	1.0	03/13/2024	AB24-0313-01
Iron	17600		ug/L	20.0	03/13/2024	AB24-0313-01
Lead	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Lithium	13		ug/L	10.0	03/13/2024	AB24-0313-01
Molybdenum	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Nickel	6		ug/L	2.0	03/13/2024	AB24-0313-01
Selenium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Silver	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Thallium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Vanadium	16		ug/L	2.0	03/13/2024	AB24-0313-01
Zinc	12		ug/L	10.0	03/13/2024	AB24-0313-01

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0131-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1860000		ug/L	1000.0	03/12/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	3790		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0131-01-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	3300		mg/L	10.0	03/08/2024	AB24-0308-07

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Analytical Report

Report Date: 03/20/24
04/15/24R

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15008**
Lab Sample ID: 24-0131-02
Matrix: Groundwater

Laboratory Project: **24-0131**
Collect Date: 03/05/2024R
Collect Time: 09:19 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0131-02-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0131-02-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Arsenic	3		ug/L	1.0	03/13/2024	AB24-0313-01
Barium	92		ug/L	5.0	03/13/2024	AB24-0313-01
Beryllium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Boron	128		ug/L	20.0	03/13/2024	AB24-0313-01
Cadmium	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Calcium	124000		ug/L	1000.0	03/13/2024	AB24-0313-01
Chromium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Cobalt	ND		ug/L	6.0	03/13/2024	AB24-0313-01
Copper	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Iron	18900		ug/L	20.0	03/13/2024	AB24-0313-01
Lead	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Lithium	20		ug/L	10.0	03/13/2024	AB24-0313-01
Molybdenum	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Nickel	4		ug/L	2.0	03/13/2024	AB24-0313-01
Selenium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Silver	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Thallium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Vanadium	7		ug/L	2.0	03/13/2024	AB24-0313-01
Zinc	ND		ug/L	10.0	03/13/2024	AB24-0313-01

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0131-02-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	400000		ug/L	1000.0	03/10/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	5640		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0131-02-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1010		mg/L	10.0	03/08/2024	AB24-0308-07

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Analytical Report

Report Date: 03/20/24
04/15/24R

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15016**
Lab Sample ID: 24-0131-03
Matrix: Groundwater

Laboratory Project: **24-0131**
Collect Date: 03/05/2024R
Collect Time: 11:40 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0131-03-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0131-03-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Arsenic	12		ug/L	1.0	03/13/2024	AB24-0313-01
Barium	131		ug/L	5.0	03/13/2024	AB24-0313-01
Beryllium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Boron	336		ug/L	20.0	03/13/2024	AB24-0313-01
Cadmium	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Calcium	227000		ug/L	1000.0	03/13/2024	AB24-0313-01
Chromium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Cobalt	ND		ug/L	6.0	03/13/2024	AB24-0313-01
Copper	2		ug/L	1.0	03/13/2024	AB24-0313-01
Iron	18200		ug/L	20.0	03/13/2024	AB24-0313-01
Lead	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Lithium	72		ug/L	10.0	03/13/2024	AB24-0313-01
Molybdenum	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Nickel	7		ug/L	2.0	03/13/2024	AB24-0313-01
Selenium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Silver	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Thallium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Vanadium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Zinc	ND		ug/L	10.0	03/13/2024	AB24-0313-01

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0131-03-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	117000		ug/L	1000.0	03/10/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	271000		ug/L	1000.0	03/10/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0131-03-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1090		mg/L	10.0	03/08/2024	AB24-0308-07

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Analytical Report

Report Date: 03/20/24
04/15/24R

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15019**
Lab Sample ID: 24-0131-04
Matrix: Groundwater

Laboratory Project: **24-0131**
Collect Date: 03/05/2024R
Collect Time: 10:00 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0131-04-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0131-04-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Arsenic	2		ug/L	1.0	03/13/2024	AB24-0313-01
Barium	361		ug/L	5.0	03/13/2024	AB24-0313-01
Beryllium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Boron	241		ug/L	20.0	03/13/2024	AB24-0313-01
Cadmium	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Calcium	174000		ug/L	1000.0	03/13/2024	AB24-0313-01
Chromium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Cobalt	ND		ug/L	6.0	03/13/2024	AB24-0313-01
Copper	1		ug/L	1.0	03/13/2024	AB24-0313-01
Iron	23000		ug/L	20.0	03/13/2024	AB24-0313-01
Lead	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Lithium	14		ug/L	10.0	03/13/2024	AB24-0313-01
Molybdenum	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Nickel	4		ug/L	2.0	03/13/2024	AB24-0313-01
Selenium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Silver	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Thallium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Vanadium	2		ug/L	2.0	03/13/2024	AB24-0313-01
Zinc	ND		ug/L	10.0	03/13/2024	AB24-0313-01

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0131-04-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	383000		ug/L	1000.0	03/10/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	92700		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0131-04-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1220		mg/L	10.0	03/08/2024	AB24-0308-07

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Analytical Report

Report Date: 03/20/24
04/15/24R

Sample Site: **DEK JCW Background**
Field Sample ID: **DUP-Background**
Lab Sample ID: 24-0131-05
Matrix: Groundwater

Laboratory Project: **24-0131**
Collect Date: 03/05/2024R
Collect Time: 12:00 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0131-05-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0131-05-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Arsenic	3		ug/L	1.0	03/13/2024	AB24-0313-01
Barium	92		ug/L	5.0	03/13/2024	AB24-0313-01
Beryllium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Boron	126		ug/L	20.0	03/13/2024	AB24-0313-01
Cadmium	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Calcium	122000		ug/L	1000.0	03/13/2024	AB24-0313-01
Chromium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Cobalt	ND		ug/L	6.0	03/13/2024	AB24-0313-01
Copper	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Iron	18600		ug/L	20.0	03/13/2024	AB24-0313-01
Lead	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Lithium	20		ug/L	10.0	03/13/2024	AB24-0313-01
Molybdenum	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Nickel	4		ug/L	2.0	03/13/2024	AB24-0313-01
Selenium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Silver	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Thallium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Vanadium	6		ug/L	2.0	03/13/2024	AB24-0313-01
Zinc	ND		ug/L	10.0	03/13/2024	AB24-0313-01

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0131-05-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	399000		ug/L	1000.0	03/10/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	5940		ug/L	1000.0	03/09/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0131-05-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1030		mg/L	10.0	03/08/2024	AB24-0308-07

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Analytical Report

Report Date: 03/20/24
04/15/24R

Sample Site: **DEK JCW Background**
Field Sample ID: **FB- Background**
Lab Sample ID: 24-0131-06
Matrix: Water

Laboratory Project: **24-0131**
Collect Date: 03/05/2024R
Collect Time: 12:00 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0131-06-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2024	AB24-0311-02

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0131-06-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Arsenic	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Barium	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Beryllium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Boron	ND		ug/L	20.0	03/13/2024	AB24-0313-01
Cadmium	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Calcium	2410		ug/L	1000.0	03/13/2024	AB24-0313-01
Chromium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Cobalt	ND		ug/L	6.0	03/13/2024	AB24-0313-01
Copper	5		ug/L	1.0	03/13/2024	AB24-0313-01
Iron	344		ug/L	20.0	03/13/2024	AB24-0313-01
Lead	2		ug/L	1.0	03/13/2024	AB24-0313-01
Lithium	ND		ug/L	10.0	03/13/2024	AB24-0313-01
Molybdenum	ND		ug/L	5.0	03/13/2024	AB24-0313-01
Nickel	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Selenium	ND		ug/L	1.0	03/13/2024	AB24-0313-01
Silver	ND		ug/L	0.2	03/13/2024	AB24-0313-01
Thallium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Vanadium	ND		ug/L	2.0	03/13/2024	AB24-0313-01
Zinc	13		ug/L	10.0	03/13/2024	AB24-0313-01

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0131

Inspection Date: 3/7/24 **Inspection By:** CIE | LMO

Sample Origin/Project Name: Q1-2024 JCW-DEK Background

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 271839379620 Shipping Form Attached: Yes ✓ No ____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler (1) Cardboard Box _____ Custom Case _____ Envelope/Mailer ____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 0.4 - 1.4°C Samples Received on Ice: Yes ✓ No ____

M&TE # and Expiration 015402 5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	11				
24 mL vial (glass)					
250 ~~500~~ mL (plastic)	5				
Other _____					

pH paper Lot # 205522 Exp. 2.15.25

pg. 2 of 2 not needed

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q1-2024 JCW-DEK Background Wells

PROJECT NUMBER: 24-0131

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: TRC

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	REMARKS
24-0131-01	3/5/24	1052	GW	MW-15002	3	2	1						x	x	x	
-02	3/5/24	919	GW	MW-15008	3	2	1						x	x	x	
-03	3/5/24	1140	GW	MW-15016	3	2	1						x	x	x	
-04	3/5/24	1000	GW	MW-15019	3	2	1						x	x	x	
-05	3/5/24	—	GW	DUP-Background	3	2	1						x	x	x	
-06	3/5/24	—	W	FB- Background	1								x			

RELINQUISHED BY: [signature] DATE/TIME: 3/6/24 1600 RECEIVED BY: Fedex

RELINQUISHED BY: Fed EX DATE/TIME: 03/07/24 09:45 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015402

Temperature: 0.4-1.4 °C Cal. Due Date: 05-23-24

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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: March 20, 2024

Subject: HMP GROUNDWATER MONITORING – JCWEADOCK ASD – 2024 Q1

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0133R

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site during the week of 03/04/2024 for the 1st Quarter requirements, as specified in the Hydrogeological Monitoring Plan for the site. The sample was received for analysis by the Chemistry department of Laboratory Services on 03/07/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative, or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, latest edition.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2024 Weadock ASD
Date Received: 3/7/2024
Chemistry Project: 24-0133

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0133-01	JCW-OW-18001	Groundwater	03/05/2024 07:40	JC Weadock ASD

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Analytical Report

Report Date: 03/20/24

Sample Site: **JC Weadock ASD**
Field Sample ID: **JCW-OW-18001**
Lab Sample ID: 24-0133-01
Matrix: Groundwater

Laboratory Project: **24-0133**
Collect Date: 03/05/2024
Collect Time: 07:40 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0133-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Arsenic	136		ug/L	1.0	03/11/2024	AB24-0311-03
Barium	85		ug/L	5.0	03/11/2024	AB24-0311-03
Beryllium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Boron	1710		ug/L	20.0	03/11/2024	AB24-0311-03
Cadmium	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Calcium	246000		ug/L	1000.0	03/11/2024	AB24-0311-03
Chromium	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Cobalt	ND		ug/L	6.0	03/11/2024	AB24-0311-03
Copper	1		ug/L	1.0	03/11/2024	AB24-0311-03
Iron	10100		ug/L	20.0	03/11/2024	AB24-0311-03
Lead	ND		ug/L	1.0	03/11/2024	AB24-0311-03
Lithium	67		ug/L	10.0	03/11/2024	AB24-0311-03
Magnesium	56100		ug/L	1000.0	03/11/2024	AB24-0311-03
Molybdenum	8		ug/L	5.0	03/11/2024	AB24-0311-03
Nickel	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Potassium	11100		ug/L	100.0	03/11/2024	AB24-0311-03
Selenium	1		ug/L	1.0	03/11/2024	AB24-0311-03
Silver	ND		ug/L	0.2	03/11/2024	AB24-0311-03
Sodium	67300		ug/L	1000.0	03/11/2024	AB24-0311-03
Thallium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Vanadium	ND		ug/L	2.0	03/11/2024	AB24-0311-03
Zinc	ND		ug/L	10.0	03/11/2024	AB24-0311-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0133-01-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/12/2024	AB24-0311-02

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0133-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	55300		ug/L	1000.0	03/09/2024	AB24-0308-01
Fluoride	ND		ug/L	1000.0	03/09/2024	AB24-0308-01
Sulfate	544000		ug/L	1000.0	03/10/2024	AB24-0308-01

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0133-01-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1280		mg/L	10.0	03/07/2024	AB24-0308-02

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Analytical Report

Report Date: 03/20/24

Sample Site: **JC Weadock ASD**
Field Sample ID: **JCW-OW-18001**
Lab Sample ID: 24-0133-01
Matrix: Groundwater

Laboratory Project: **24-0133**
Collect Date: 03/05/2024
Collect Time: 07:40 AM

Alkalinity by SM 2320B

Aliquot #: 24-0133-01-C04-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	401000		ug/L	10000.0	03/07/2024	AB24-0308-12
Alkalinity Bicarbonate	401000		ug/L	10000.0	03/07/2024	AB24-0308-12
Alkalinity Carbonate	ND		ug/L	10000.0	03/07/2024	AB24-0308-12

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0133

Inspection Date: 3.07.24 **Inspection By:** LMO

Sample Origin/Project Name: Q1-2024 Weadock ASD

Shipment Delivered By: Enter the type of shipment carrier.

Pony ____ FedEx ✓ UPS ____ USPS ____ Airborne ____

Other/Hand Carry (whom) ____

Tracking Number: 271836082 2968 Shipping Form Attached: Yes ✓ No ____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box ____ Custom Case ____ Envelope/Mailer ____

Loose/Unpackaged Containers ____ Other ____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented ____ Leaking ____

Other ____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened ____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request ____ Air Data Sheet ____ Other ____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 0.4-2.0 Samples Received on Ice: Yes ____ No ____

M&TE # and Expiration 015402 5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or (60mL))	2				
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	2				
24 mL vial (glass)					
500 mL (plastic)					
Other 250mL plastic	1				

pH paper Lot # 205522 Exp 2.15.25

Pg. 2 of 2 not needed

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Page _____ of _____

SAMPLING SITE / CUSTOMER: Q1-2024 Weadock ASD	PROJECT NUMBER: 24-0133	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	
SEND REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register / TRC	MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste		

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	ANALYSIS REQUESTED: Total Metals	Anions	TDS	Alkalinity
24-0133-01	3/5/24	0740	GW	JCW-OW-18001	5	4	1						x	x	x	x

QA REQUIREMENT:
☐ NPDES
☒ TNI
☐ ISO 17025
☐ 10 CFR 50 APP. B
☐ INTERNAL INFO
☐ OTHER _____

REMARKS

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
	3/6/24 1515	Fed Ex
Fed Ex	03/07/24 EB 03/8/24	09:45

COMMENTS:

Received on Ice? ☒ Yes ☐ No M&TE #: 015402

Temperature: 0.4-2.0 °C Cal. Due Date: 05-23-24

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135 W. Trail St.
Jackson, MI 49201

phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: March 20, 2024

Subject: HMP GROUNDWATER MONITORING – JCW LEACHATE WELLS – 2024 Q1

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0134

TRC Environmental, Inc. conducted groundwater monitoring at the JC Weadock site during the week of 03/04/2024 for the 1st Quarter requirements, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry Department of Laboratory Services on 03/07/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements. In order to minimize contamination, the samples submitted for Low Level Mercury analysis were preserved in the Mercury clean-room upon receipt at the laboratory, as specified in the corresponding test method.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2024 Weadock Leachate Wells
Date Received: 3/7/2024
Chemistry Project: 24-0134

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0134-01	LH-103R	Groundwater	03/06/2024 10:33	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-02	LH-103R Dup	Groundwater	03/06/2024 00:00	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-03	LH-103R MS	Groundwater	03/06/2024 10:33	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-04	LH-103R MSD	Groundwater	03/06/2024 10:33	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-05	LH-104	Groundwater	03/06/2024 11:50	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-06	LH-104 Dup	Groundwater	03/06/2024 00:00	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-07	FB-02	Water	03/06/2024 10:55	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-08	EB-02	Water	03/06/2024 12:10	JCW Solid Waste Disposal Area - Leachate Wells
24-0134-09	TB-02	Water	03/06/2024 00:00	JCW Solid Waste Disposal Area - Leachate Wells

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**LH-103R**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-01	Collect Time:	10:33 AM
Matrix:	Groundwater		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-01-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	ND		ng/L	0.5	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**LH-103R Dup**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-02	Collect Time:	12:00 AM
Matrix:	Groundwater		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-02-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	ND		ng/L	0.5	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**LH-103R MS**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-03	Collect Time:	10:33 AM
Matrix:	Groundwater		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-03-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	103		%	0.5	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area - Leachate Wells**
Field Sample ID: **LH-103R MSD**
Lab Sample ID: 24-0134-04
Matrix: Groundwater

Laboratory Project: **24-0134**
Collect Date: 03/06/2024
Collect Time: 10:33 AM

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-04-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	109		%	0.5	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**LH-104**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-05	Collect Time:	11:50 AM
Matrix:	Groundwater		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-05-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	0.67		ng/L	0.5	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**LH-104 Dup**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-06	Collect Time:	12:00 AM
Matrix:	Groundwater		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-06-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	0.68		ng/L	0.5	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site: **JCW Solid Waste Disposal Area - Leachate Wells**
Field Sample ID: **FB-02**
Lab Sample ID: 24-0134-07
Matrix: Water

Laboratory Project: **24-0134**
Collect Date: 03/06/2024
Collect Time: 10:55 AM

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-07-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	ND		ng/L	0.2	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**EB-02**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-08	Collect Time:	12:10 PM
Matrix:	Water		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-08-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	ND		ng/L	0.2	03/13/2024	AB24-0312-08

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Analytical Report

Report Date: 03/20/24

Sample Site:	**JCW Solid Waste Disposal Area - Leachate Wells**	Laboratory Project:	**24-0134**
Field Sample ID:	**TB-02**	Collect Date:	03/06/2024
Lab Sample ID:	24-0134-09	Collect Time:	12:00 AM
Matrix:	Water		

Mercury, Low Level by EPA 1631E

Aliquot #: 24-0134-09-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	ND		ng/L	0.2	03/13/2024	AB24-0312-08

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0134

Inspection Date: 03/07/24 **Inspection By:** CIE/LMO

Sample Origin/Project Name: Q1-2024 Bradock Leachate

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 271839379610 Shipping Form Attached: Yes ✓ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler (1) Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range NA Samples Received on Ice: Yes _____ No ✓

M&TE # and Expiration NA

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)					
24 mL vial (glass)					
500 mL (plastic)					
Other 8oz	9				

pH paper Lot # 205522 Exp. 2.15.25

PG-292 not needed

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SAMPLING SITE / CUSTOMER: Q1-2024 Weadock Leachate Wells

PROJECT NUMBER: 24-0134

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: TRC

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed): Low Level Mercury

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Low Level Mercury	REMARKS
24-0134-01	3/6/24	1032	GW	LH-103R	1					1			x	
-02	"	—	GW	LH-103R Dup	1					1			x	
-03	"	1033	GW	LH-103R MS	1					1			x	
-04	"	1033	GW	LH-103R MSD	1					1			x	
-05	"	1140	GW	LH-104	1					1			x	
-06	"	—	GW	LH-104 Dup	1					1			x	
-07	3/6/24	1055	W	FB-02	1					1			x	
-08	3/6/24	1210	W	EB-02	1					1			x	
-09	3/6/24	—	W	TB-02	1					1			x	

RELINQUISHED BY: [signature] — DATE/TIME: 3/6/24/1600 — RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex — DATE/TIME: 3.7.24 0945 — RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☐ Yes ☑ No — M&TE #: N/A

Temperature: N/A °C — Cal. Due Date: N/A

Appendix F
Field Records

TRC

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance
PROJECT NUMBER:	553828.0000.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	~~3/6/24~~ 3/4/2024 TO 3/6/2024
PURPOSE OF FIELDWORK:	First Quarter 2024 Groundwater Sampling
WORK PERFORMED BY:	Jake Krenz, Javier Jasso, Andrew Whaley, Elric Rinehart

3/14/24
SIGNED DATE

3/21/24
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC ~~Kam BAP/LI: 2024 GW Comp~~ Weadock CF	DATE: 3/4/24	TIME ARRIVED: 0700
PROJECT NUMBER: 553828.0000.00000	AUTHOR: (JJ) JK AW	TIME LEFT: 1530

WEATHER		
TEMPERATURE: 60 °F	WIND: 15 MPH	VISIBILITY: Clear

WORK / SAMPLING PERFORMED

SWL
Annual Safety training

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM - Updates
	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	Purge to Ground

[signature] 3/21/24
SIGNED DATE

3/21/24 [signature]
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Weadock LF: 2024 GW Com	DATE: 3/5/24	TIME ARRIVED: 0955
PROJECT NUMBER:	553828.0000.0000	AUTHOR: AW JK JJ ER	TIME LEFT: 1410

WEATHER		
TEMPERATURE: 40 °F	WIND: 20 MPH	VISIBILITY: Overcast Rain

WORK / SAMPLING PERFORMED

JCW-MW-18001MS, MSD, JCW-OW-18001, 50, Dup#01
51, 55, 18004, 54R, 53R, 52,

Elric - Background wells

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED 3/14/24 DATE

CHECKED BY 3/6/24 DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Weadock LF: 2024 GW Com	DATE: 3/4/24	TIME ARRIVED: 0540
PROJECT NUMBER:	553828.0000.0000	AUTHOR: AW JK JJ ER	TIME LEFT: 1230

WEATHER		
TEMPERATURE: 37 °F	WIND: 25 MPH	VISIBILITY: Overcast

WORK / SAMPLING PERFORMED

JCW-MW 1800S, 1800D, Dup #02, DW Strout SB, EB #1, FB #01,

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED 3/14/24 DATE

CHECKED BY 3/21/24 DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Weadock LF: 2024 GW Co	SAMPLER NAME:	J. Jasso,
PROJECT NO.:	553828.0000.0000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NA	NA
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PURGING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)

SAMPLING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
GEOTECH DISPOSABLE FILTER	0.45 MICRON
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

STORE BOUGHT	LABORATORY PROVIDED
POTABLE WATER SOURCE	DI WATER SOURCE
3/14/24	3/21/24
SIGNED / DATE	CHECKED BY / DATE

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	MODEL:	DO DSS	SAMPLER:	JJ
PROJECT NO.:	553828.0000.0000	SERIAL #:	AA	DATE:	3/5/24

PH CALIBRATION CHECK

pH 7 (LOT #): 36J0918 (EXP. DATE): 10/25	pH 4 / 10 (LOT #): 3610691 (EXP. DATE): 9/25	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
7.00 / 7.00	4.00 / 4.00	☑ WITHIN RANGE	0510
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 36K0801 (EXP. DATE): 11/24	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
1360 / 1340	24.	☑ WITHIN RANGE	0510
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 23E1007C (EXP. DATE): 5/26	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
223 / 223	20	☑ WITHIN RANGE	0510
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING /SATURATED AIR			
8.57 / 8.57	22	☑ WITHIN RANGE	0510
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A3097 (EXP. DATE): 4/25	(LOT #): (EXP. DATE):	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0 / 0	/	☑ WITHIN RANGE	0510
100 / 100	/	☑ WITHIN RANGE	0510
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED [signature] 3/14/24 DATE

CHECKED BY [signature] 3/21/24 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	MODEL:	Aquadss	SAMPLER:	JJ
PROJECT NO.:	553828.0000.0000	SERIAL #:	AM	DATE:	3/6/24

PH CALIBRATION CHECK

pH 7 (LOT #): 360910 (EXP. DATE): 10/25 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 3610691 (EXP. DATE): 9/25 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.00 / 7.00	4.00 / 4.00	☒ WITHIN RANGE	0500
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 360901 (EXP. DATE): 11/24 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1360 / 1360	24	☒ WITHIN RANGE	0500
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 3E100350 (EXP. DATE): 5/25 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
223 / 223	22	☒ WITHIN RANGE	0500
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
8.87 / 8.87	20	☒ WITHIN RANGE	0500
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): 43087 (EXP. DATE): 9/25 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0 / 0	/	☒ WITHIN RANGE	0500
100 / 100	/	☒ WITHIN RANGE	0500
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION
(LOT #):
(EXP. DATE):

☑ STANDARD SOLUTION (S)
LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK

CALIBRATED PARAMETERS		CALIBRATION RANGES (1)	
☐	pH	pH:	+/- 0.2 S.U.
☐	COND	COND:	+/- 1% OF CAL. STANDARD
☐	ORP	ORP:	+/- 25 mV
☐	D.O.	D.O.:	VARIES
☐	TURB	TURB:	+/- 5% OF CAL. STANDARD
☐	_____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER	
☐	_____		

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED _____ 3/14/24 DATE

CHECKED BY _____ 3/21/24 DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	DATE:	2/4/24
PROJECT NUMBER:	553828.0000.0000	AUTHOR:	Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
JCW-MW-18001	0618	TOC	17.9<	23.7<	NA	NM
JCW-MW-18004	0658	TOC	12.98	14.74	NA	NM
JCW-MW-18005	0736	TOC	8.1<	16.28	NA	NM
JCW-MW-18006	0918	TOC	12.73	23.62	NA	NM
JCW-OW-18001	0619	TOC	6.60	20?<	NA	NM
JCW-OW-18002	0624	TOC	10.78	19.78	NA	NM
JCW-OW-18003	0625	TOC	8.28	18.67	NA	NM
JCW-OW-18004	0700	TOC	6.36	14.85<	NA	NM
JCW-OW-18006	0920	TOC	7.02	34?<	NA	NM
LH-103R	0717	TOC	21.26	33.46	NA	NM
LH-104	0707	TOC	8.0<	14.00	NA	NM
JCW-MW-20	0736	TOC	6.16	14.00	NA	NM
MW-50	0623	TOC	14.53	20.00	NA	NM
MW-51	0630	TOC	15.24	20.00	NA	NM
MW-52	0634	TOC	16.00	19.74	NA	NM
MW-53	0640	TOC	14.58	18.18	NA	NM
MW-53R	0647	TOC	15.38	18.18	NA	NM
MW-54R	0653	TOC	14.7<	17.27	NA	NM
MW-55	0711	TOC	14.84	16.3?	NA	NM
MW-58	0943	TOC	5.33	18.28	NA	NM
OW-51	0631	TOC	9.1<	17.28	NA	NM
OW-53	0642	TOC	7.48	18.00	NA	NM
OW-54	0651	TOC	6.52	16.48	NA	NM
OW-55	0712	TOC	6.16	18.42	NA	NM
OW-56	0741	TOC	5.6<	19.27	NA	NM

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/14/24 DATE

CHECKED 3/21/24 DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	DATE:	3/4/24
PROJECT NUMBER:	553828.0000.0000	AUTHOR:	Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-56R	0742	TOC	5.66	22.22	NA	NM
OW-57 IN	0744	TOC	5.65	19.60	NA	NM
OW-57R IN	0744	TOC	5.80	20.18	NA	NM
OW-57 OUT	0746	TOC	8.63	19.44	NA	NM
OW-57R OUT	0748	TOC	9.63	20.20	NA	NM
JCW-MW-15007	0935	TOC	3.02	8.95	NA	NM
JCW-MW-15009	0936	TOC	9.40	13.00	NA	NM
JCW-MW-15010	0930	TOC	18.03	19.57	NA	NM
JCW-MW-15028	0930	TOC	7.80	25.10	NA	NM
MW-15002	0953	TOC	6.73	16.80	NA	NM
MW-15008	0939	TOC	4.33	17.40	NA	NM
MW-15016	0951	TOC	5.53	9.94	NA	NM
MW-15019	0949	TOC	5.46	16.67	NA	NM
JCMW15003	0634	"	7.72	100 plus	"	"
JCMW 15002	0642	"	14.35	100 plus	"	"
MW 16R	0653	"	15.00	19.67	"	"
JCW-MW15021	0703	"	15.05	100 plus	"	"
OW-61	0722	"	6.26	37.10	"	"
MW-19	0751	"	8.40	20.63	"	"
JCMW15003	0927	"	8.72	100 plus	"	"
MW 106B	0933	"	7.45	41.18	"	"
MW-15020	0941	"	5.00	17.17	"	"
MW-116B	0944	"	4.66	32.76	"	"
MW15024	0947	"	6.00	17.17	"	"
JCWMW15021	0955	"	8.18	100 plus	"	"
MW-15014	0957		3.31	8.46		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/14/24 DATE

CHECKED 3/21/24 DATE

REVISED 04/2019

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: JCW-MW-1801 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0607	DATE: 3/5/24	SAMPLE	TIME: 0637	DATE: 3/5/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.75 SU	CONDUCTIVITY: 3433 umhos/cm	
			ORP: -36.7 mV	DO: 0.91 mg/L	
DEPTH TO WATER: 17.91 T/ PVC			TURBIDITY: 6.1 NTU		
DEPTH TO BOTTOM: 23.75 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 9.7 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 3 ☒ LITERS ☐ GALLONS			COLOR: clear	ODOR: non	
COLOR: clear ODOR: non			FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☒ MS/MSD ☐ DUP- ____		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0607	100	4w	2985	22.3	8.85	10.2	10.7	17.62	INITIAL
0612		6.60	3243	16.9	1.81	6.6	10.1	1770	.5
0617		6.70	3306	-28	1.3	6.6	10.4	1770	1
0622		6.75	3390	-34	1.0	6.7	10.5	1770	1.5
0627		6.75	3424	-36.0	0.97	6.5	9.8	1770	2
0632		6.75	3437	-36.2	0.97	6.3	9.7	1770	2.5
0637		6.75	3433	-36.7	0.91	6.1	9.7	1770	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☒ N
3	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☒ N
2	60 mL	VOA	A	☐ Y ☒ N					☐ Y ☐ N
3	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	3/5/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: YW-CC-18001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0700	DATE: 3/15/24	SAMPLE	TIME: 0740	DATE: 3/15/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 6.40 T/ PVC

DEPTH TO BOTTOM: 20.71 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4 ☑ LITERS ☐ GALLONS

COLOR: cloudy ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 6.90 SU | CONDUCTIVITY: 1547 umhos/cm

ORP: -11.2 mV | DO: 3.9 mg/L

TURBIDITY: 10 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 8.7 °C | FERROUS Fe _____ mg/L

COLOR: clear | ODOR: none

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: _____ | FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0700	100	7.58	1547	12.1	10.0	55	7.6	6.65	INITIAL
0705		7.14	1526	26.6	6.60	36	8.4	6.70	.5
0710		7.00	1529	12.7	6.1	25	8.4	6.70	1
0715		7.00	1537	6.1	5.8	25	8.4	6.70	1.5
0720		6.99	1530	0.5	5.4	26	8.3	6.70	2
0725		6.95	1537	-4.8	5.0	18	8.5	6.70	2.5
0730		6.90	1541	-10.5	4.0	10	8.6	6.70	3
0735		6.90	1544	-11.0	4.0	10	8.4	6.70	3.5
0740		6.90	1547	-11.2	3.9	10	8.7	6.70	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☒ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☒ N
2	60 mL	VOA	A	☐ Y ☒ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	3/15/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW-50 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0754	DATE: 3/5/24	SAMPLE	TIME: 0824	DATE: 3/5/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 14.53 T/ PVC

DEPTH TO BOTTOM: 20.00 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3.5 ☑ LITERS ☐ GALLONS

COLOR: Cloudy ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.45 SU | CONDUCTIVITY: 1447 umhos/cm

ORP: -45.5 mV | DO: 1.0 mg/L

TURBIDITY: 6.0 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 8.6 °C | FERROUS Fe _____ mg/L

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: _____ | FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☒ DUP- #01

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0754	100	7.53	1362	37	9.5	45	7.4	14.32	INITIAL
0759		7.40	1394	18.5	2.4	13.7	8.5	1435	1
0804		7.41	1428	-1.2	1.4	7.3	8.4	1435	1
0809		7.45	1433	-21.5	1.3	7.5	8.7	1435	1.5
0814		7.45	1444	-32.0	1.1	6.0	8.7	1435	2
0819		7.45	1448	-45.0	1.0	6.0	8.6	1435	2.5
0824		7.45	1444	-45.2	1.0	6.0	8.6	1435	3
0829		7.45	1447	-45.5	1.0	6.0	8.6	1435	3.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
2	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
2	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/5/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW 51 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0851	DATE: 3/5/24	SAMPLE	TIME: 0921	DATE: 3/5/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.41 SU	CONDUCTIVITY: 1256	umhos/cm
			ORP: -16.0 mV	DO: 1.41	mg/L
DEPTH TO WATER:	15.24 T/ PVC		TURBIDITY: 6.4 NTU		
DEPTH TO BOTTOM:	20.00 T/ PVC		☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	3 NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 8.7 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	3 ☑ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Clear ODOR: none		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0891	100	7.94	1225	15.8	10	13	7.0	15.24	INITIAL
0856		7.56	1230	5.1	3.9	8.0	7.8	15.30	.1
0901		7.45	1237	0.5	2.4	7.7	8.1	1530	1
0906		7.45	1242	-4.5	2.0	7.2	8.1	1530	1.1
0911		7.41	1250	-15.5	1.50	6.5	8.2	1530	2
0916		7.41	1254	-15.8	1.50	6.4	8.1	1530	2.1
0921		7.41	1256	-16.0	1.45	6.4	8.2	1530	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☑ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☐ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/5/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW 55 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0943	DATE: 3/5/24	SAMPLE	TIME: 1023	DATE: 3/5/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 14.84 T/ PVC

DEPTH TO BOTTOM: 16.34 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4 ☒ LITERS ☐ GALLONS

COLOR: Brownish ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 6.90 SU | CONDUCTIVITY: 1210 umhos/cm

ORP: -57.3 mV | DO: 1.0 mg/L

TURBIDITY: 9.9 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 7.6 °C | FERROUS Fe _____ mg/L

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: _____ | FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0943	100	7.26	1208	-6.5	8.8	100	8.0	14.78	INITIAL
0948		6.95	1213	-39.0	2.2	61	7.8	14.85	.1
0953		6.90	1214	-51	1.3	26	7.7	14.85	1
0958		6.95	1210	-60	1.1	21	7.6	14.85	1.5
1003		6.93	1209	-61	1.0	17	7.6	14.85	2
1008		6.93	1209	-60.5	1.0	15	7.5	14.85	2.5
1013		6.90	1209	-57.5	1.0	10	7.6	14.85	3
1018		6.90	1210	-57.3	1.0	10	7.6	14.85	3.5
1023		6.90	1210	-57.2	1.0	9.9	7.6	14.85	4.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☒ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: JCW MW 18004 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1038	DATE: 3/5/24	SAMPLE	TIME: 1103	DATE: 3/5/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.04 SU	CONDUCTIVITY: 1451	umhos/cm
			ORP: 78.5 mV	DO: 9.0	mg/L
DEPTH TO WATER: 12.96 T/ PVC			TURBIDITY: 10.3 NTU		
DEPTH TO BOTTOM: 14.74 T/ PVC			☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 6.1 °C	FERROUS Fe	mg/L
VOLUME REMOVED: 2.1 ☐ LITERS ☐ GALLONS			COLOR: clear	ODOR: non	
COLOR: clear	ODOR: non		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1038	100	7.26	1396	76.9	10	10.3	6.3	12.93	INITIAL
1043		7.05	1414	80	9.6	6.6	6.5	13.20	.5
1048		7.05	1438	78.5	9.4	6.4	6.4	13.46	1
1053		7.04	1448	78.6	9.3	6.3	6.5	13.55	1.5
1058		7.04	1451	78.6	9.6	6.2	6.5	13.55	2
1103		7.04	1451	78.5	9.0	6.2	6.5	1360	2.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/14/24

SAMPLE ID: MW-542 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1116	DATE: 3/5/24	SAMPLE	TIME: 1146	DATE: 3/5/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 14.75 T/ PVC

DEPTH TO BOTTOM: 17.27 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3 ☑ LITERS ☐ GALLONS

COLOR: Brown ODOR: nor

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.00 SU | CONDUCTIVITY: 1131 umhos/cm

ORP: 49.5 mV | DO: 1.9 mg/L

TURBIDITY: 8.9 NTU

☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 6.9 °C | FERROUS Fe _____ mg/L

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☐ YES ☑ NO

FILTRATE COLOR: _____ | FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1116	100	7.29	1103	58.8	9.8	185	7.0	14.33	INITIAL
1121		7.06	1113	60.7	4.8	32	7.0	14.86	.1
1126		7.00	1117	63.5	3.8	15	7.1	14.45	1
1131		7.00	1127	59	2.0	10	7.6	14.45	1.5
1136		7.00	1130	50	2.0	9.0	7.0	14.45	2
1141		7.00	1131	50	1.9	8.9	7.0	14.45	2.5
1146		7.00	1131	49.5	1.9	8.9	6.9	14.45	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/18/24

SAMPLE ID: MW 53R | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1202	DATE: 3/5/24	SAMPLE	TIME: 1232	DATE: 3/5/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.00 SU	CONDUCTIVITY: 1241	umhos/cm
			ORP: 6.5 mV	DO: 0.91	mg/L
DEPTH TO WATER:	15.34 T/ PVC		TURBIDITY: 6.9 NTU		
DEPTH TO BOTTOM:	18.16 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 7.7 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	3 ☐ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Tannish	ODOR: none	FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1203	100	7.33	1252	55.7	9.3	210	7.8	1492	INITIAL
1207		7.08	1273	52.0	2.2	100	7.8	1516	.5
1212		7.07	1272	40	1.3	23	7.7	1510	1
1217		7.00	1259	30	1.0	9	7.7	1510	1.5
1222		7.00	1246	8.5	0.97	7	7.7	1510	2
1227		7.00	1241	8.4	0.91	6.9	7.7	1510	2.5
1232		7.00	1245	8.5	0.91	6.9	7.7	1510	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW 53 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1241	DATE: 3/5/24	SAMPLE	TIME: 1311	DATE: 3/5/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.54 SU	CONDUCTIVITY: 1104	umhos/cm
			ORP: -32.1 mV	DO: 0.85	mg/L
DEPTH TO WATER:	14.58 T/ PVC		TURBIDITY: 10 NTU		
DEPTH TO BOTTOM:	18.12 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 7.8 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	3 ☒ LITERS ☐ GALLONS		COLOR: clear	ODOR: none	
COLOR:	Brownish ODOR: none		FILTRATE (0.45 um) ☐ YES	☒ NO	
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP-	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1241	100	7.63	1072	-21.5	9.5	80	7.2	14.38	INITIAL
1246		7.64	1090	-4.1	1.5	30	7.6	14.45	.1
1251		7.60	1097	-3.5	1.2	19	7.7	14.45	1
1256		7.58	1100	-13.5	1.0	17	7.8	14.45	1.5
1301		7.55	1101	-32.0	0.96	10	7.6	14.45	2
1306		7.54	1103	-32.1	0.87	10	7.7	14.45	2.5
1311		7.54	1104	-32.5	0.85	10	7.8	14.45	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	-
COC NUMBER:	-	SIGNATURE:		DATE SIGNED:	3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/4/24	BY: AW	DATE: 3/21/24

SAMPLE ID: DUP MW 18005 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0605	DATE: 3/6/24	SAMPLE	TIME: 0723	DATE: 3/6/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.70 SU	CONDUCTIVITY: 1605	umhos/cm
			ORP: -8.5 mV	DO: 0.85	mg/L
DEPTH TO WATER:	8.81 T/ PVC		TURBIDITY: 9.1 NTU		
DEPTH TO BOTTOM:	16.28 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 6.1 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	7.5 ☐ LITERS ☐ GALLONS		COLOR: CLEAR	ODOR: NOR	
COLOR:	BROWN ODOR: NOR		FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0600	100	6.6	771	223	6.8	200	7.6	8.58	INITIAL
0613		6.58	1561	95	2.6	186	6.1	9.36	.5
0618		6.70	1561	84	1.80	89	6.0	9.48	1
0623		6.71	1560	70	1.5	45	6.0	9.71	1.5
0628		6.71	1560	60	1.3	34	5.9	9.85	2
0633		6.71	1560	50	1.3	30	6.0	9.90	2.5
0638		6.71	1564	41	1.2	30	6.1	10.0	3
0643		6.71	1561	30	1.1	28	6.2	10.0	3.5
0648		6.71	1563	20	1.1	28	6.1	10.0	4
0653		6.72	568	20	1.1	26	6.2	10.0	4.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☑ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC

WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Weadock LF: 2024 GW Co	PREPARED			CHECKED		
PROJECT NUMBER:	553828.0000.0000	BY:	JJ	DATE: 3/14/24	BY: AWS	DATE: 3/21/24	

SAMPLE ID: JCW MW 1800S

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0658	100	6.71	1573	10	1.0	19	6.1	10.03	5
0703		6.70	1574	5.6	1.0	17	6.3	10.03	5.5
0708		6.70	1576	1.1	0.95	15	6.2	10.05	6
0713		6.70	1586	-8.0	0.80	10	6.1	10.10	6.5
0718		6.70	1595	-8.3	0.87	9.5	6.1	10.10	7
0723		6.70	1605	-8.5	0.85	9.5	6.1	10.10	7.5

SIGNATURE: 3/14/24

DATE SIGNED: _____

REVISED 04/2019

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED			CHECKED		
PROJECT NUMBER:	553828.0000.0000	BY:	JJ	DATE: 3/14/24	BY:	AW	DATE: 3/21/24

SAMPLE ID: OW-57 Rout | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0740	DATE: 3/16/24	SAMPLE	TIME: 0810	DATE: 3/16/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.19 SU	CONDUCTIVITY: 1167 umhos/cm	
			ORP: 43.0 mV	DO: 4.3 mg/L	
DEPTH TO WATER:	8.42 T/ PVC		TURBIDITY: 5.7 NTU		
DEPTH TO BOTTOM:	19.46 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 6.1 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED:	3 ☑ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Cloudy ODOR: none		FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0740	100	7.38	1147	41.9	10	60	5.7	9.97	INITIAL
0745		7.19	1168	40.5	5.4	16	6.6	10.12	.5
0750		7.18	1169	35	4.7	7.8	6.9	11.35	1
0755		7.19	1171	36	4.6	6.0	6.5	11.95	1.5
0800		7.14	1166	42.5	4.4	5.8	6.4	12.55	2
0805		7.19	1167	42.5	4.3	5.7	6.5	13.97	2.5
0810		7.19	1167	43.0	4.3	5.7	6.1	13.4x	3
									3.5
									4
									4.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/16/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER: 553828.0000.0000	BY: JJ	DATE: 3/4/24	BY: AW	DATE: 3/21/24

SAMPLE ID: JCW-MW-18006 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0827	DATE: 3/6/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 12.73 T/ PVC

DEPTH TO BOTTOM: 23.65 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3 ☒ LITERS ☐ GALLONS

COLOR: Brown ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0857	DATE: 3/6/24

PH: 7.04 SU CONDUCTIVITY: 1157 umhos/cm

ORP: -66.3 mV DO: 0.87 mg/L

TURBIDITY: 9.3 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 7.6 °C FERROUS Fe _____ mg/L

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: _____ FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☒ DUP- B02

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0827	100	7.19	1162	24.1	10	20.1	5.1	12.14	INITIAL
0832		7.00	1179	-37	2.6	50	6.9	12.87	.5
0837		7.03	1116	-57.0	1.1	11.9	7.1	12.87	1
0842		7.01	1116	-65	1.0	11.0	7.6	12.87	1.5
0847		7.04	1142	-67.5	0.93	9.5	7.5	12.87	2
0852		7.03	1152	-66.3	0.89	9.1	7.6	12.87	2.5
0857		7.04	1157	-66.3	0.87	9.3	7.6	12.87	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
3	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
3	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
3	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Fed Ex	DATE SHIPPED: 3/6/24	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE:	DATE SIGNED: 3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW 58 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0909	DATE: 3/6/24	SAMPLE	TIME: 0934	DATE: 3/6/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.00 SU	CONDUCTIVITY: 2197 umhos/cm	
			ORP: -76.0 mV	DO: 0.84 mg/L	
DEPTH TO WATER: 5.33 T/ PVC			TURBIDITY: 5.4 NTU		
DEPTH TO BOTTOM: 15.98 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 6.7 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 5 ☑ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: Clear	ODOR: none		FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0904	200	7.39	1933	4.1	10.	5.7	5.5	5.7	INITIAL
0914		6.97	2496	-38.4	1.7	7.9	6.7	533	1
0919		7.03	2381	-59.5	1.00	5.6	6.6	533	2
0924		7.08	2224	-75.8	0.95	5.5	6.7	533	3
0929		7.08	2215	-76.0	0.86	5.5	6.7	533	4
0934		7.08	2195	-76.0	0.84	5.4	6.7	533	5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

WATER SAMPLE LOG

PROJECT NAME:	CEC ~~Kan-RAP/WSP~~: Additiona	PREPARED	CHECKED
PROJECT NUMBER:	553814.0002.0000	BY: AW, JJ, JK, ER DATE: 3/14/24	BY: AW DATE: 3/21/24

SAMPLE ID: FB01 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: _____ T/ PVC

DEPTH TO BOTTOM: _____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: _____ ☐ LITERS ☐ GALLONS

COLOR: _____ ODOR: _____

TURBIDITY

☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0940	DATE: 3/14/24

PH: NA SU CONDUCTIVITY: NA umhos/cm

ORP: NA mV DO: NA mg/L

TURBIDITY: NA NTU

☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: NA °C FERROUS Fe _____ mg/L

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☐ YES ☑ NO

FILTRATE COLOR: _____ FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
									INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
	250 mL	PLASTIC	A	☐ Y ☐ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED: 3/16/24	AIRBILL NUMBER: —
COC NUMBER:	—	SIGNATURE:	DATE SIGNED: 3/14/24

WATER SAMPLE LOG

TRC

PROJECT NAME: ~~CEG Karn RAP~~/WSP: Additiona	PREPARED	CHECKED
PROJECT NUMBER: ~~553814.0002.0~~000	BY: AW, JJ, JK, ER DATE: 3/14/24	BY: AW DATE: 3/21/24

SAMPLE ID: EB-01

WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: ____ T/ PVC

DEPTH TO BOTTOM: ____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: ____ ☐ LITERS ☐ GALLONS

COLOR: ____ ODOR: ____

TURBIDITY

☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0943	DATE: 3/19/24

PH: NM SU CONDUCTIVITY: NM umhos/cm

ORP: NM mV DO: NM mg/L

TURBIDITY: NM NTU

☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: NM °C FERROUS Fe ____ mg/L

COLOR: Cle ODOR: None

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: ____ FILTRATE ODOR: ____

QC SAMPLE: ☐ MS/MSD ☐ DUP- ____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
									INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
	250 mL	PLASTIC	A	☐ Y ☐ N		125 mL	PLASTIC	D	☐ Y ☐ N
(	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
(	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Fed Ex	DATE SHIPPED: 3.1.24	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE:	DATE SIGNED: 3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn RAP/WSP: Additiona	PREPARED	CHECKED
PROJECT NUMBER:	~~553814.0002.0000~~ 553828.0000	BY: AW, JJ, JK, ER DATE: 3/14/24	BY: AW DATE: 3/21/24

SAMPLE ID: LH-103R	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER
WELL MATERIAL:	☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1003	DATE: 3/14/24	SAMPLE	TIME: 1033	DATE: 3/14/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.98 SU	CONDUCTIVITY: 2795	umhos/cm
			ORP: -98.5 mV	DO: 0.67	mg/L
DEPTH TO WATER: 21.38 T/ PVC			TURBIDITY: 4.9 NTU		
DEPTH TO BOTTOM: 33.46 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 9.0 °C	FERROUS Fe	mg/L
VOLUME REMOVED: 0 ☑ LITERS ☐ GALLONS			COLOR: Clear	ODOR: Non	
COLOR: Blackish	ODOR: Non		FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☑ MS/MSD ☑ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS: LL Hg		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1003	200	7.07	3054	-77.2	9.48	170	7.3	21.37	INITIAL
1008		6.99	2903	-63.8	2.0	12.6	8.5	21.57	1.5
1013		6.99	2886	-77.0	1.35	7.1	8.8	21.60	2.0
1018		6.99	2879	-85.0	1.16	5.3	8.9	21.61	7.5
1023		6.98	2849	-98.0	0.97	5.0	8.9	21.63	9.0
1028		6.98	2800	-98.3	0.88	4.9	9.0	21.62	9.5
1033		6.98	2795	-98.5	0.67	4.9	9.0	21.63	10.

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	4	250	Glass	A E	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	DATE SHIPPED:	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 3/14/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn RAP/WSP: Additiona	PREPARED	CHECKED
PROJECT NUMBER:	553814.0002.0000	BY: AW, JJ, JK, ER DATE: 3/14/24	BY: AW DATE: 3/26/24

SAMPLE ID: LH104 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1120	DATE: 3/16/24	SAMPLE	TIME: 1150	DATE: 3/16/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 8.55 SU	CONDUCTIVITY: 928 umhos/cm	
			ORP: -91.3 mV	DO: 2.1 mg/L	
DEPTH TO WATER:	60.1 T/ PVC		TURBIDITY: 5.5 NTU		
DEPTH TO BOTTOM:	14.00 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 8.0 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED:	3 ☐ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Clear ODOR: none		FILTRATE (0.45 um) ☐ YES	☒ NO	
TURBIDITY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☒ DUP- ____	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:	LL Hg	

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1120	10.0	8.38	948	-24.0	1.0	9.0	7.4	7.96	INITIAL
1125		8.27	944	-19.1	6.20	5.8	7.8	8.50	.5
1130		8.27	936	-18.2	5.5	5.9	7.9	8.55	1
1135		8.24	926	-36	3.4	5.5	8.0	8.65	1.5
1140		8.25	928	-50.5	2.5	5.5	8.1	8.65	2
1145		8.24	928	-51.0	2.5	5.5	8.1	8.65	2.5
1150		8.25	928	-51.3	2.5	5.5	8.0	8.65	3
									3.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	4	250	Glass	E	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/16/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/16/24

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn LF: 2024 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: ~~553814.0000.0000~~ 553825	BY: AW, JJ, JK, ER DATE: 3/5/24	BY: AW DATE: 3/21/24

SAMPLE ID: MW-15008 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 843	DATE: 11

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 4.25 T/ PVC

DEPTH TO BOTTOM: 17.42 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 7.2 ☑ LITERS ☐ GALLONS

COLOR: Yellowish ODOR: No

TURBIDITY ☐ NONE ☑ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 919	DATE: 3/5/24

PH: 6.7 SU CONDUCTIVITY: 1505.7 umhos/cm

ORP: -115.1 mV DO: 1.51 mg/L

TURBIDITY: 0.0 NTU ☐ NONE ☑ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 8.48 °C FERROUS Fe 7.0 mg/L

COLOR: Yellowish ODOR: No

FILTRATE (0.45 um) ☐ YES ☐ NO

FILTRATE COLOR: FILTRATE ODOR:

QC SAMPLE: ☐ MS/MSD ☑ DUP- Background

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
843	200	6.61	1931.1	-80.4	1.72	1.15	8.84	4.25	INITIAL
846		6.64	1791.0	-97.9	1.57	0.0	8.93	—	0.6
849		6.67	1670.6	-104.6	1.54	8.92	8.67	—	1.2
852		6.7	1547.5	-110.4	1.53	2.14	8.56	—	1.8
855		6.71	1495.3	-112.9	1.53	88.41	8.43		2.4
858		6.71	1484.3	-113.4	1.57	0.0	8.48		3.0
901		6.71	1496.9	-112.7	1.60	22.44	8.49		3.6
904		6.71	1488.9	-113.4	1.57	0.0	8.48		4.2
907		6.7	1485.7	-113.3	1.57	3.29	8.46		4.8
910		6.7	1492.3	-113.6	1.58	16.23	8.52		5.4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
2	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
2	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Courier	DATE SHIPPED: 3/5/24	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE:	DATE SIGNED: 3/5/24

TRC

WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn LF: 2024 GW Compli	PREPARED		CHECKED	
PROJECT NUMBER:	~~553814.0000.0000~~ 553528	BY: W, JJ, JK, E	DATE: 3/5/24	BY: AW	DATE: 3/12/24

SAMPLE ID: MW - 15008

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
913	200	6.7	1463.2	-113.0	1.59	0.0	8.52	4.25	6.0
916	↓	6.7	1494.9	-113.1	1.52	0.0	8.49	↓	6.6
919	↓	6.7	1505.7	-115.1	1.51	0.0	8.48	↓	7.2

SIGNATURE: [signature]

DATE SIGNED: 3/5/24

WATER SAMPLE LOG

PROJECT NAME: CEC Karn LF: 2024 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: ~~553814.0000.0000~~ 553828	BY: AW, JJ, JK, ER DATE: 3/5/24	BY: AW DATE: 3/21/24

SAMPLE ID: MW - 150dg | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 951	DATE: "

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 5.33 T/ PVC

DEPTH TO BOTTOM: 16.85 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 1.8 ☒ LITERS ☐ GALLONS

COLOR: yellowish ODOR: slight

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1000	DATE: "

PH: 6.72 SU | CONDUCTIVITY: 1765.1 umhos/cm

ORP: -87.9 mV | DO: 1.63 mg/L

TURBIDITY: 0.0 NTU

☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 7.27 °C | FERROUS Fe 6.0 mg/L

COLOR: yellowish | ODOR: slight

FILTRATE (0.45 um) ☐ YES ☐ NO

FILTRATE COLOR: | FILTRATE ODOR:

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
951	200	6.75	1763.1	-75.1	2.34	0.0	7.51	5.37	INITIAL
954	↓	6.72	1765.3	-82.2	1.76	3.65	7.46	5.43	0.6
957		6.72	1765.4	-86.5	1.65	0.0	7.35	—	1.2
1000		6.72	1765.1	-87.9	1.63	0.0	7.27	—	1.8
									~~2.4~~
									~~3.0~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Courier	DATE SHIPPED: 3/5/24	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 3/5/24

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn LF: 2024 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: ~~553814.0000.0000~~ 553828	BY: AW, JJ, JK, ~~EF~~ DATE: 3/5/24	BY: AW DATE: 3/21/24

SAMPLE ID: MW-15002	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER
SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE	☐ OTHER

PURGING	TIME: 1025	DATE: "
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER	
DEPTH TO WATER: 6.61 T/ PVC		
DEPTH TO BOTTOM: 16.68 T/ PVC		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS		
VOLUME REMOVED: 5.2 ☒ LITERS ☐ GALLONS		
COLOR: Orange	ODOR: Slight	
TURBIDITY ☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER		

SAMPLE	TIME: 1052	DATE: "
PH: 6.71 SU	CONDUCTIVITY: 4727.6 umhos/cm	
ORP: -69.2 mV	DO: 1.76 mg/L	
TURBIDITY: 0.0 NTU		
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 8.25 °C	FERROUS Fe 6.0 mg/L	
COLOR: Orange	ODOR: Slight	
FILTRATE (0.45 um) ☐ YES ☒ NO		
FILTRATE COLOR:	FILTRATE ODOR:	
QC SAMPLE: ☐ MS/MSD ☐ DUP-		
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1025	200	7.46	576.4	-85.9	2.52	7.64	8.18	6.61	INITIAL
1028		6.82	3062.1	-61.4	1.73	511.66	8.22	6.81	0.6
1031		6.76	3747.5	-63.2	1.65	273.06	8.14	6.85	1.2
1034		6.74	4010.2	-64.5	1.61	177.1	8.07	6.86	1.8
1037		6.73	4231.1	-65.9	1.61	0.0	8.2	—	2.4
1040		6.72	4367.6	-67.6	1.6	0.0	8.22	—	3.0
1043		6.72	4461.0	-68.5	1.63	13.61	8.14	—	3.6
1046		6.71	4591.4	-69.2	1.65	0.0	8.26	—	4.2
1049		6.71	4648.9	-69.3	1.72	0.23	8.2	6.86	4.8
1052		6.71	4727.6	-69.2	1.76	0.0	8.25	"	5.2

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED	PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F -								
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Courier	DATE SHIPPED: 3/5/24	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 3/5/24

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn LF: 2024 GW Comp	PREPARED		CHECKED	
PROJECT NUMBER:	553814.0000.0000	BY: AW, JJ, JK, ER	DATE: 3/5/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW-15016 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1116	DATE: 3/5/24	SAMPLE	TIME: 1140	DATE: "
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.98 SU	CONDUCTIVITY: 1317.8	umhos/cm
			ORP: -102.4 mV	DO: 1.53	mg/L
DEPTH TO WATER:	3.12 T/ PVC		TURBIDITY: 0.0 NTU		
DEPTH TO BOTTOM:	7.76 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 5.84 °C	FERROUS Fe 3.0	mg/L
VOLUME REMOVED:	4.8 ☑ LITERS ☐ GALLONS		COLOR: Clear ish	ODOR: No	
COLOR:	Clear ish ODOR: No		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1116	200	6.99	936.92	-70.3	2.99	215.9	7.12	3.12	INITIAL
1119	"	7.03	1076.3	-86.2	1.75	98.16	6.07	—	0.6
1122		7.0	1209.0	-91.4	1.61	45.75	5.95	—	1.2
1125		6.99	1246.2	-94.5	1.58	21.33	5.91	—	1.8
1128		6.99	1264.8	-96.6	1.56	8.3	5.88		2.4
1131		6.99	1266.7	-98.3	1.59	5.35	5.83		3.0
1134		6.98	1307.7	-100.3	1.54	0.09	5.79		3.6
1137		6.98	1312.9	-101.3	1.53	0.0	5.84		4.2
1140		6.98	1317.8	-102.4	1.53	0.0	5.84		4.8

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Courier	DATE SHIPPED:	3/5/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/5/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 3/14/24	BY: AW	DATE: 3/21/24

SAMPLE ID: MW 53 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1320	DATE: 3/5/24	SAMPLE	TIME: 1350	DATE: 3/5/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.02 SU	CONDUCTIVITY: 1635 umhos/cm	
DEPTH TO WATER:	16.00 T/ PVC		ORP: -15.0 mV	DO: 1.0 mg/L	
DEPTH TO BOTTOM:	19.74 T/ PVC		TURBIDITY: 10 NTU		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
VOLUME REMOVED:	3 ☑ LITERS ☐ GALLONS		TEMPERATURE: 7.8 °C	FERROUS Fe ____ mg/L	
COLOR:	Brownish ODOR: none		COLOR: clear	ODOR: none	
TURBIDITY			FILTRATE (0.45 um) ☐ YES ☐ NO		
☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		QC SAMPLE: ☐ MS/MSD ☐ DUP- ____		
			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1320	100	7.03	1562	-5.9	9.0	60	7.3	15.70	INITIAL
1325		7.20	1605	5.4	2.0	43	7.8	1585	.5
1330		7.10	1619	4.6	1.7	27	7.9	1585	1
1335		7.00	1626	-3.5	1.2	16	7.9	1585	1.5
1340		7.02	1632	-14.5	1.0	10	7.8	1585	2
1345		7.02	1633	-14.5	1.0	10	7.8	1585	2.5
1350		7.02	1635	-15.0	1.0	10	7.8	1585	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed Ex	DATE SHIPPED:	3/6/24	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/14/24

TRC

WELL INSPECTION REPORT

PROJECT NAME: CEC Weadock LF: 2024 GW Compliance	SAMPLER NAME: ~~Javier Jasso~~ Jake Koenz
PROJECT NO.: 553828.0000.0000	DATE: 3/6/2024

WELL ID	PROTECTIVE CASING Condition	SURFACE SEAL	DEGREE OF IMMOBILITY OF PROTECTIVE CASING	PERMANENT LEGIBLE LABELS	LOCK	WELL CAP	EASE OF INSERTING / REMOVING BAILER	SEDIMENT IN WELL	COMMENT
~~JCW-MW-18001~~	Good	Good	No Mobility	Legible	✓	✓	~~No resistance~~ N/A	Slight	
JCW-OW-18001	Good	Good	Slight Mobility	Legible	✓	✓	N/A	Slight	Bollards move easily By hand
MW-50	Good	Good	No Mobility	Legible	✓	✓	N/A	~~None~~ Slight	
JCW-OW-18002	Good	Good	Slight Mobility	Legible	✓	✓	N/A	~~None~~ Slight	Bollards move easily By hand
MW-51	Good	Good	No Mobility	Legible	✓	✓	N/A	None	
OW-51	Good	Good	No Mobility	Legible	✓	✓	N/A	None	Stainless Steel casing
MW-52	Good	Good	No Mobility	Legible	✓	✓	N/A	None	
JCW-OW-18003	Good	Good	No Mobility	Legible	✓	✓		None	
JCW-MW-18022	Good	Good	No Mobility	Legible	✓	✓		N/A	Bedrock well, over ~~120'~~ 102' Deep
MW-53	Good	Good	No Mobility	Legible	✓	✓		None	
OW-53	Good	Good	No Mobility	Legible	✓	✓		None	
MW-53R	Good	Good	No Mobility	Legible	✓	✓		None	Bollards move ~~easily~~ slightly by hand
JCW-MW-15002	Good	Good	No Mobility	Legible	✓	✓		N/A	Bedrock well, over 102' Deep
~~MW-54/16R~~ MW-16R	Good	Good	No Mobility	Legible	✓	✓		None	Renamed MW-54?
MW-54R	Good	Good	Slight Mobility	Legible	✓	✓		None	
OW-54	Good	Good	No Mobility	Legible	✓	✓		None	
LH-104R	Good	Good	Moderate/High Mobility		✓	✓		None	

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3-15-24
SIGNED DATE

3/21/24
CHECKED BY DATE

REVISED 06/2011

Well ID	Protective casing condition	Surface Seal	Pro casing Mobility	Well label	Lock	cap	Sediment	Comments
SCW-MW-18004	Good	Good	No Mobility	Legible	✓	✓	None	
SCW-OW-18004	Good	Good	No Mobility	Legible	✓	✓	None	
SCW-MW-15021	Good	Good	No Mobility	Legible	✓	✓	N/A	
CW-MW-18006	Good	Good	Slight Mobility	Legible	✓	✓	None	Bollards easily moved by hand
SCW-OW-18006	Good	Good	No Mobility	Legible	✓	✓	None	
CW-MW-18005	Good	Good	Slight Mobility	Legible	✓	✓	None	Bollards easily moved by hand
W-20/SCW-MW-20	Good	Good	No Mobility	Legible	✓	✓	Moderate	
LH-103R	Good	Good	No Mobility	Legible	✓	✓	None	Unable to close pro cover, pro cover sunk around well w 4"
OW-56	Good	Good	No Mobility	Legible	NO	✓	None	
OW-56R	Good	Good	No Mobility	Legible	NO	✓	None	
OW-57IN	Good	Good	No Mobility	Legible	NO	✓	None	
OW-57OUT	Good	Good	No Mobility	Legible	✓	✓	None	
OW-57RIN	Good	Good	No Mobility	Legible	NO	✓	None	
OW-57ROUT	Good	Good	No Mobility	Legible	✓	✓	None	
SCW-MW-15010	Good	Good	No Mobility	Legible	✓	✓	None	
OW-61	Good	Good	High Mobility	Legible	✓	✓	None	
CW-MW-15009	Good	Good	No Mobility	Legible	✓	✓	None	No concrete pad around Pro Cover
CW-MW-15003	Good	Good	No Mobility	Legible	✓	✓	None	
MW-106A/ CW-MW-15028	Good	Good	No Mobility	Legible	✓	✓	N/A	Bedrock well, over 102' deep
W-106B	Good	Good	No Mobility	Legible	✓	✓	None	Bollards easily moved by hand
CW-MW-15007	Good	Good	No Mobility	Legible	NO	✓	None	Bollards easily moved by hand Lock Broke when opened
CW-MW-15001	Good	Good	High Mobility	Legible	✓	✓		
W-15002	Good	Good	No Mobility	Legible	✓	✓	N/A	Bedrock well, over 102' deep

Well ID	Protective Casing Condition	Surface Seal	Pro casing Mobility	Well label	Lock	Cap	Sediment	Comments
w-MW-18004	Good	Good	No Mobility	Legible	✓	✓	None	
w-OW-18004	Good	Good	No Mobility	Legible	✓	✓	none	
w-MW-15021	Good	Good	No Mobility	Legible	✓	✓	N/A	
w-MW-18006	Good	Good	Slight Mobility	Legible	✓	✓	None	Bollards easily moved by hand
w-OW-18006	Good	Good	No Mobility	Legible	✓	✓	None	
w-MW-18005	Good	Good	Slight Mobility	Legible	✓	✓	None	Bollards easily moved by hand
20/sew-mw-20	Good	Good	No Mobility	Legible	✓	✓	Moderate	
4-103R	Good	Good	No Mobility	Legible	✓	✓	None	Unable to close pro cover, pro cover sunk around well ~4"
w-56	Good	Good	No Mobility	Legible	NO	✓	None	
w-56R	Good	Good	No Mobility	Legible	NO	✓	None	
w-57IN	Good	Good	No Mobility	Legible	NO	✓	None	
w-57OUT	Good	Good	No Mobility	Legible	✓	✓	None	
w-57RIN	Good	Good	No Mobility	Legible	NO	✓	None	
w-57ROUT	Good	Good	No Mobility	Legible	✓	✓	None	
w-MW-15010	Good	Good	No Mobility	Legible	✓	✓	None	
OW-61	Good	Good	High Mobility	Legible	✓	✓	None	
w-MW-15009	Good	Good	No Mobility	Legible	✓	✓	none	No concrete pad around Pro Cover
w-MW-15003	Good	Good	No Mobility	Legible	✓	✓	none	
w-106A/ w-MW-15028	Good	Good	No Mobility	Legible	✓	✓	N/A	Bedrock well, over 102' deep
w-106B	Good	Good	No Mobility	Legible	✓	✓	None	Bollards easily moved by hand
w-MW-15007	Good	Good	No Mobility	Legible	NO	✓	None	Bollards easily moved by hand Lock Broke when opened
w-MW-15001	Good	Good	High Mobility	Legible	✓	✓	N/A	Bedrock well, over 102' deep
w-15002	Good	Good	No Mobility	Legible	✓	✓	None	

Pg # 3 of 4

AW 5/21/24

TRC

WELL INSPECTION REPORT

PROJECT NAME:	CEC Karn ~~LF: 2024 GW Compliance~~ / Lweadocke background
PROJECT NO.:	553814.0000.0000 / 553828.0000.0000

SAMPLER NAME:	Jake Krenz, Javier Jasso, Andrew Whaley
DATE:	3/6/24

WELL ID	PROTECTIVE CASING	SURFACE SEAL	DEGREE OF IMMOBILITY OF PROTECTIVE CASING	PERMANENT LEGIBLE LABELS	LOCK	WELL CAP	EASE OF INSERTING / REMOVING BAILER	SEDIMENT IN WELL	COMMENT
MW-15016	Good	Good	No Mobility	Legible	✓	✓	N/A	None	unable to fully close PVC cover As it has sunk around the well.
MW-15018	Good	Good	No Mobility	Legible	NO	✓	N/A	none	
MW-15019	Good	Good	No Mobility	Legible	✓	✓	N/A	none	
MW-15024	Good	Good	No Mobility	Legible	✓	✓	N/A	slight	
~~MW-116A~~ / ~~MW-15027~~ MW-58	Good	Good	NO Mobility	Legible	✓	✓	n/a	none	
MW-116B	Good	Good	No Mobility	Legible	✓	✓	N/A	none	
MW-15020	Good	Good	No Mobility	Legible	✓	✓	N/A	slight	
MW-15008	Good	Good	NO Mobility	Legible	✓	✓		None	

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SIGNED: [signature] DATE: 3-15-24

CHECKED BY: [signature] DATE: 3/21/24

REVISED 06/2011

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SAMPLING SITE / CUSTOMER: Q1-2024 Weadock Porewater Wells

PROJECT NUMBER: 24-0132

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	Alkalinity					REMARKS
24-0132-01	3/5/24	0637	GW	JCW-MW-18001	5	4	1						x	x	x	x					
-02	3/5/24	1103	GW	JCW-MW-18004	3	2	1						x	x	x						
-03	3/6/24	0723	GW	JCW-MW-18005	3	2	1						x	x	x						
-04	3/6/24	0857	GW	JCW-MW-18006	3	2	1						x	x	x						
-05	3/5/24	0839	GW	MW-50	3	2	1						x	x	x						
-06	3/5/24	0921	GW	MW-51	3	2	1						x	x	x						
-07	3/5/24	1350	GW	MW-52	3	2	1						x	x	x						
-08	3/5/24	1311	GW	MW-53	3	2	1						x	x	x						
-09	3/5/24	1232	GW	MW-53R	3	2	1						x	x	x						
-10	3/6/24	1146	GW	MW-54R	3	2	1						x	x	x						
-11	3/5/24	1023	GW	MW-55	3	2	1						x	x	x						
-12	3/6/24	0810	GW	OW-57ROUT	3	2	1						x	x	x						

RELINQUISHED BY: [signature] DATE/TIME: 3/6/24 1541 RECEIVED BY: Fed Ex

RELINQUISHED BY: Fed Ex DATE/TIME: 03/06/24 0945 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015402

Temperature: 0.4-2.0 °C Cal. Due Date: 05-23-24

Pg # 3 of 4 Pgs 4/2

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SAMPLING SITE / CUSTOMER: Q1-2024 Weadock Porewater Wells

PROJECT NUMBER: 24-0132

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	Alkalinity					REMARKS
24-0132-13	3/4/24	0924	GW	MW-58	3	2	1						x	x	x						
-14	3/5/24	—	GW	DUP-JCW-LF-01	3	2	1						x	x	x						
-15	3/4/24	—	GW	DUP-JCW-LF-02	3	2	1						x	x	x						
-16	3/5/24	0637	GW	JCW-MW-18001 MS	2	1	1						x	x							
-17	〃	0637	GW	JCW-MW-18001 MSD	2	1	1						x	x							
-18	3/4/24	0946	W	FB-01	2	1	1						x	x							
-19	3/4/24	0943	W	EB-01	2	1	1						x	x							

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RELINQUISHED BY: FedEx DATE/TIME: 03/06/24 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015402

Temperature: 0.4-2.0 °C Cal. Due Date: 05-23-24

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Page _____ of _____

SAMPLING SITE / CUSTOMER: Q1-2024 Weadock ASD	PROJECT NUMBER: **24-0133**	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	
SEND REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register; TRC			

MATRIX CODES:
GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	ANALYSIS REQUESTED: Total Metals	Anions	TDS	Alkalinity					REMARKS
24-0133-01	3/5/24	0746	GW	JCW-OW-18001	5	4	1						x	x	x	x					

QA REQUIREMENT:
☐ NPDES
☒ TNI
☐ ISO 17025
☐ 10 CFR 50 APP. B
☐ INTERNAL INFO
☐ OTHER _____

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
	3/6/24 1500	Fed Ex
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
Fed Ex	03/06/24	09:45

COMMENTS:

Received on Ice? ☒ Yes ☐ No M&TE #: 015402

Temperature: 0.4-2.0 °C Cal. Due Date: 05-23-24

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SAMPLING SITE / CUSTOMER: Q1-2024 Weadock Leachate Wells

PROJECT NUMBER: 24-0134

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: TRC

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Low Level Mercury	REMARKS
24-0134-01	3/6/24	1032	GW	LH-103R	1					1			x	
-02	"	—	GW	LH-103R Dup	1					1			x	
-03	"	1033	GW	LH-103R MS	1					1			x	
-04	"	1033	GW	LH-103R MSD	1					1			x	
-05	"	1150	GW	LH-104	1					1			x	
-06	"	—	GW	LH-104 Dup	1					1			x	
-07	3/6/24	1055	W	FB-02	1					1			x	
-08	3/6/24	1210	W	EB-02	1					1			x	
-09	3/6/24	—	W	TB-02	1					1			x	

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RELINQUISHED BY: Fed Ex DATE/TIME: 3.7.24 0945 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☐ Yes ☑ No M&TE #: N/A

Temperature: N/A °C Cal. Due Date: N/A

COC # 24-0134-01

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SAMPLING SITE / CUSTOMER: Q1-2024 JCW-DEK Background Wells

PROJECT NUMBER: 24-0131

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: TRC

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	REMARKS
24-0131-01	3/5/24	1052	GW	MW-15002	3	2	1						x	x	x	
-02	3/5/24	919	GW	MW-15008	3	2	1						x	x	x	
-03	3/5/24	1140	GW	MW-15016	3	2	1						x	x	x	
-04	3/5/24	1000	GW	MW-15019	3	2	1						x	x	x	
-05	3/5/24	—	GW	DUP-Background	3	2	1						x	x	x	
-06	3/5/24	—	W	FB- Background	1								x			

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RELINQUISHED BY: Fed Ex — DATE/TIME: 03/07/24 09:45 — RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No — M&TE #: 015402

Temperature: 0.4-1.4 °C — Cal. Due Date: 05-23-24

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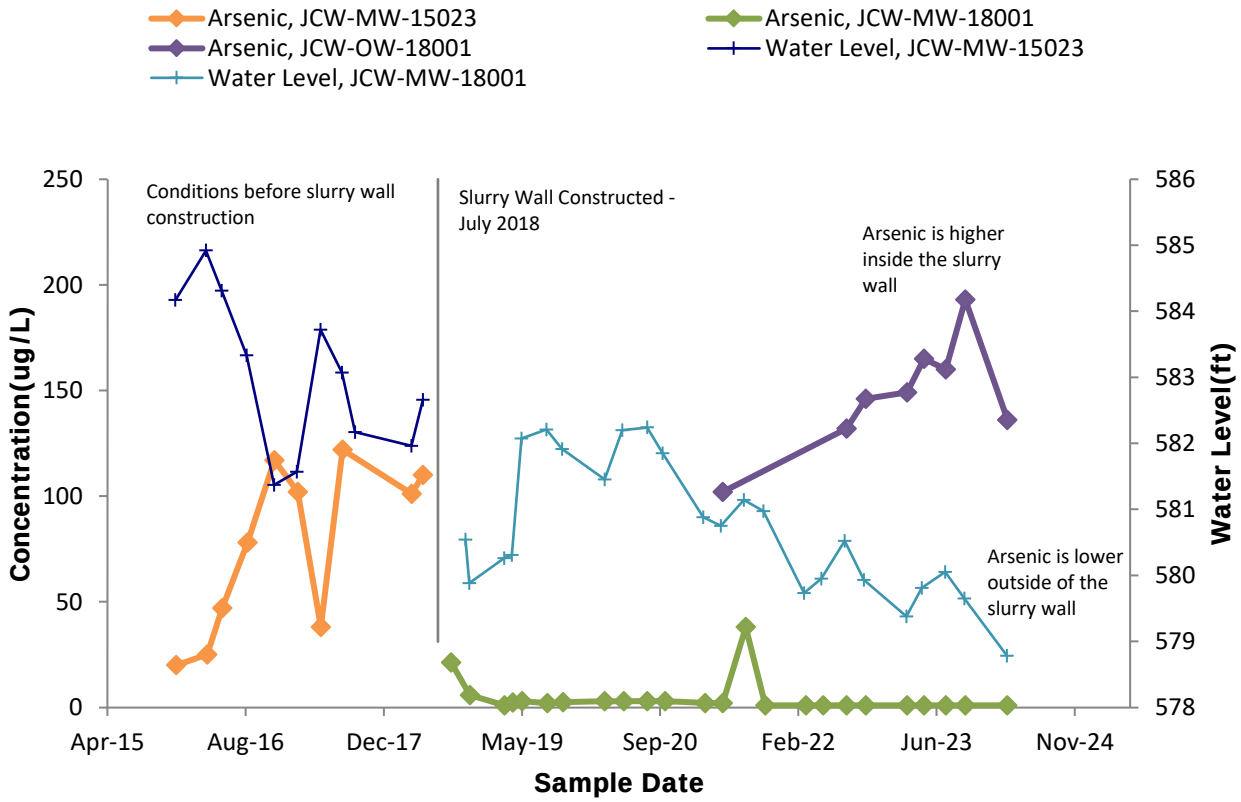
Appendix G
Alternate Source Demonstration Supporting Information

Figure G1: Time Series Plots for JCW-MW-18001 ASD



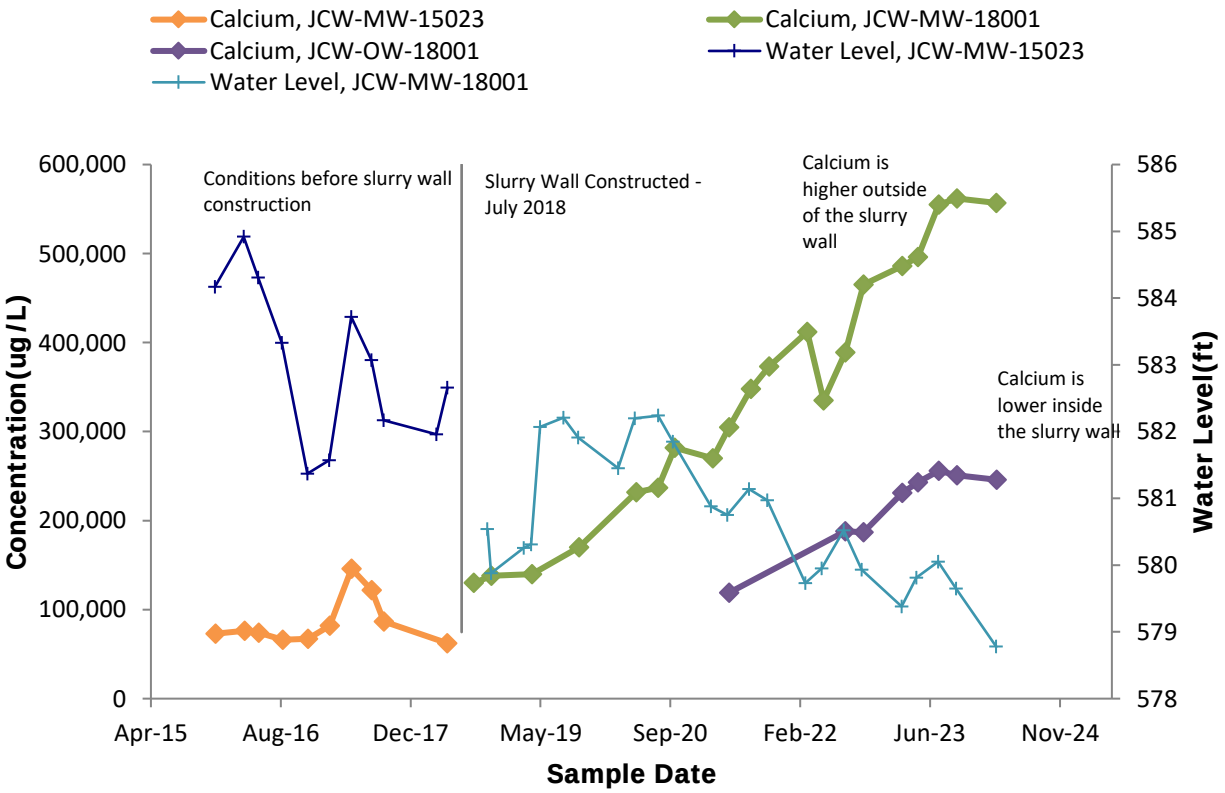
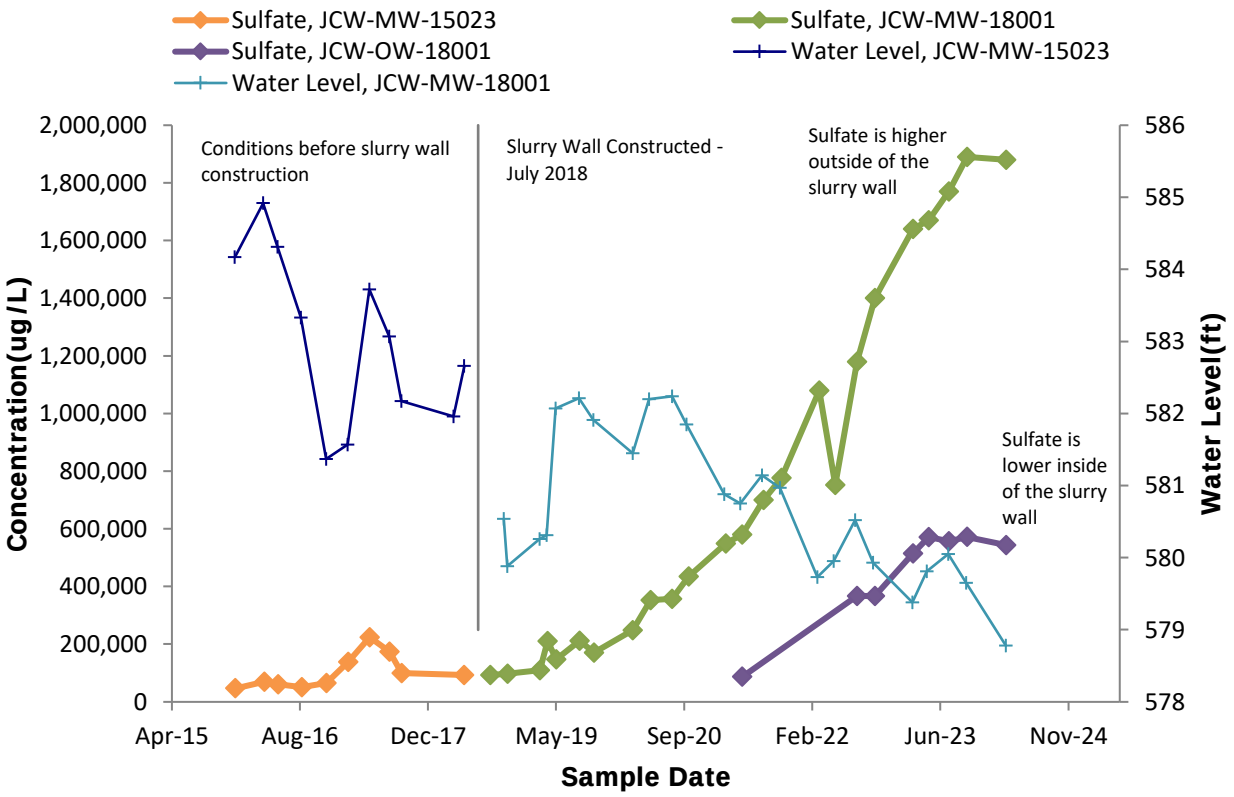


Figure G1: Time Series Plots for JCW-MW-18001 ASD



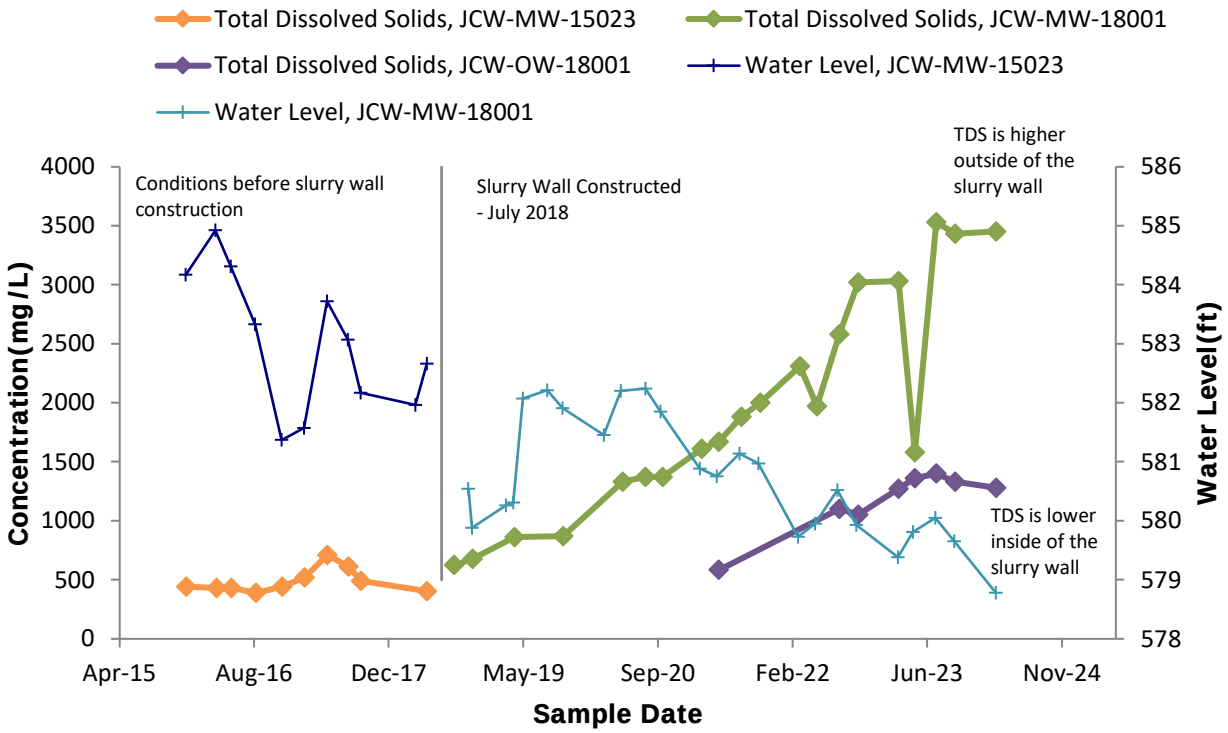
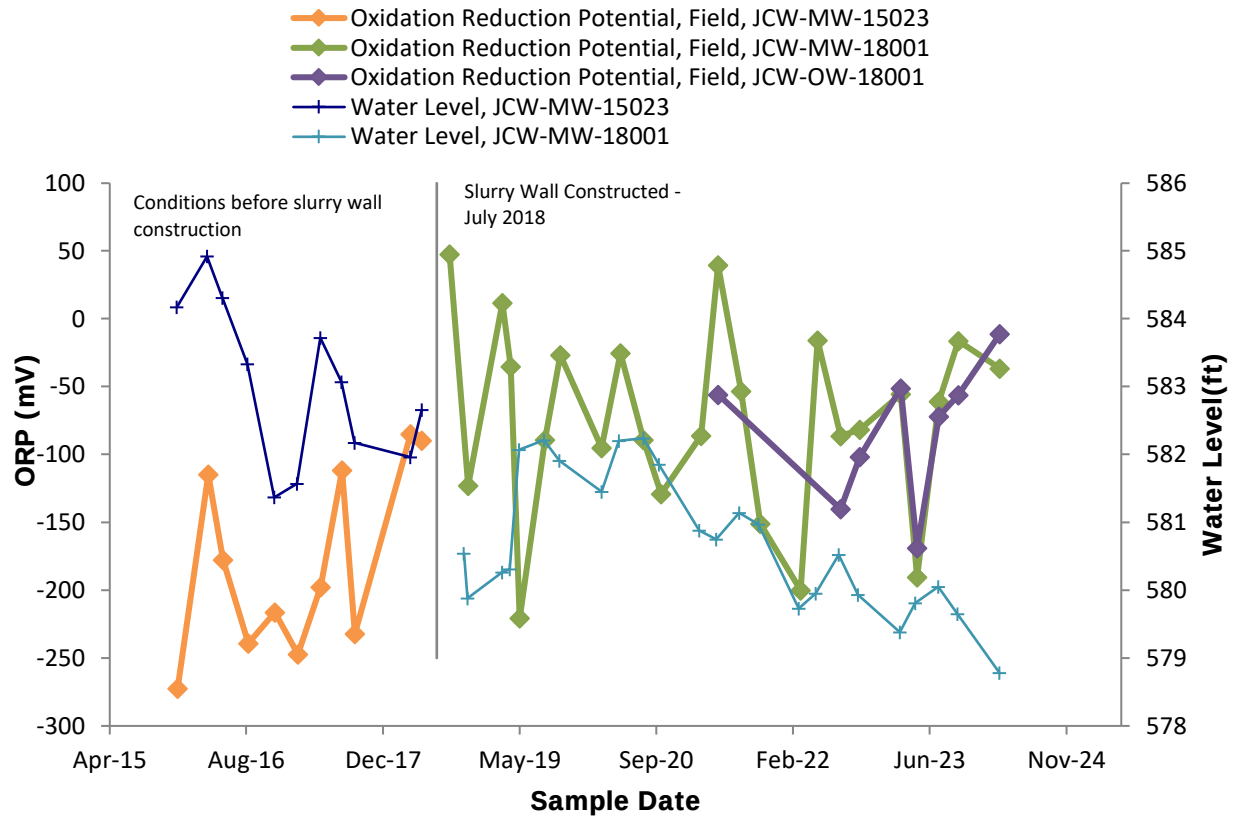


Figure G1: Time Series Plots for JCW-MW-18001 ASD



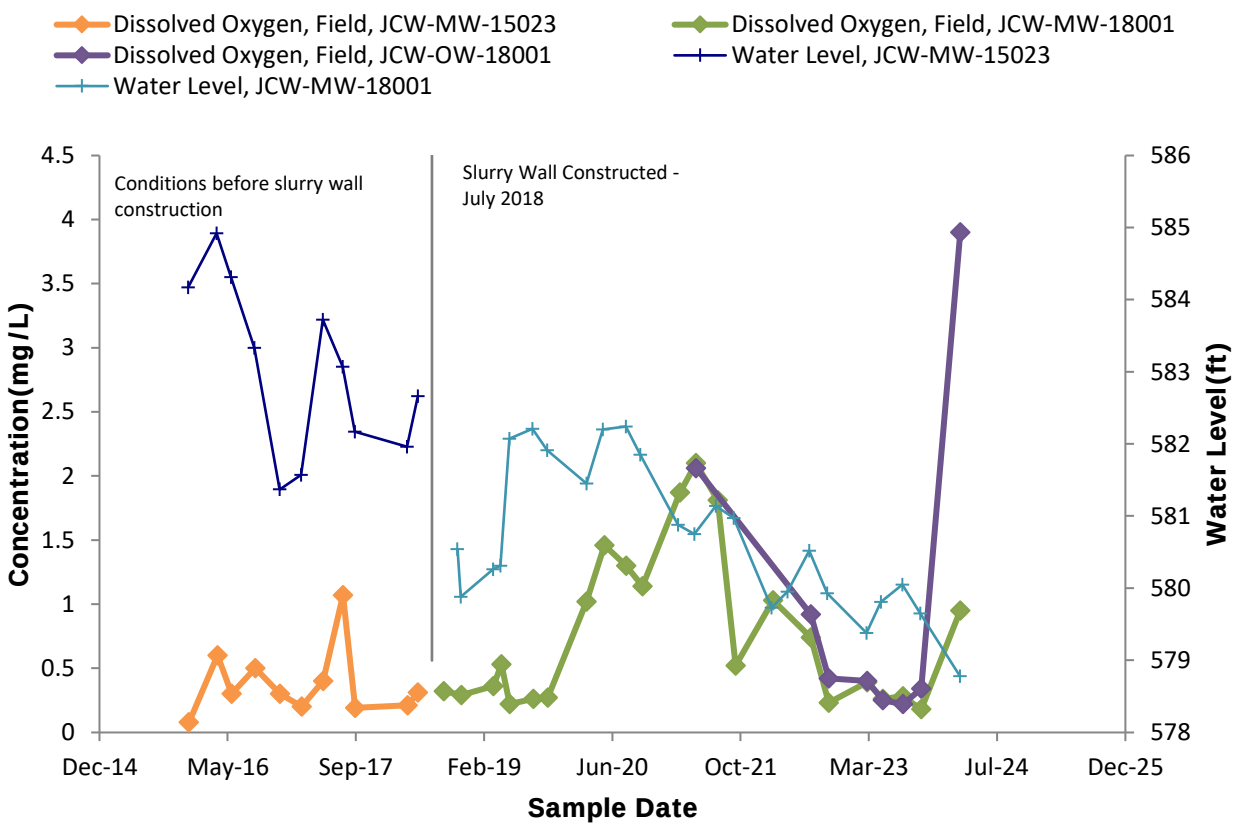
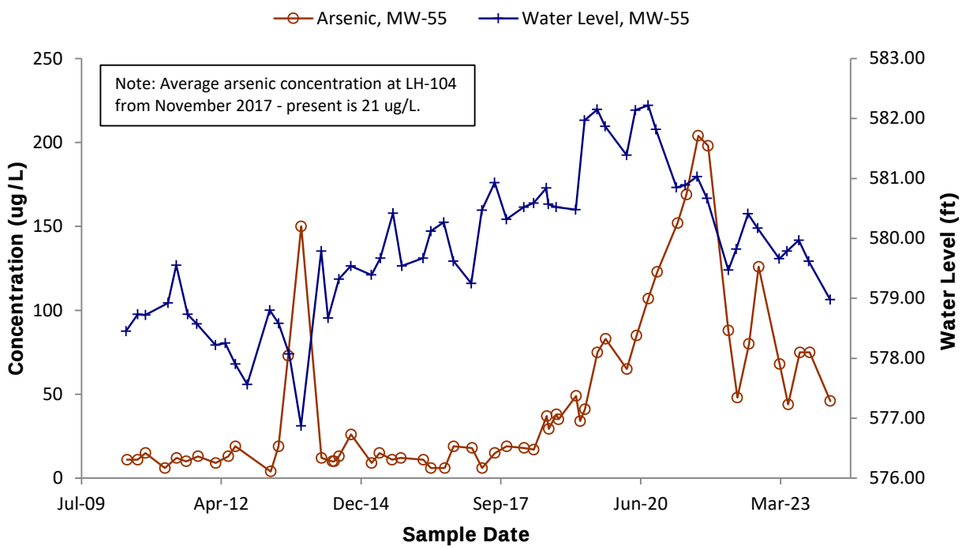
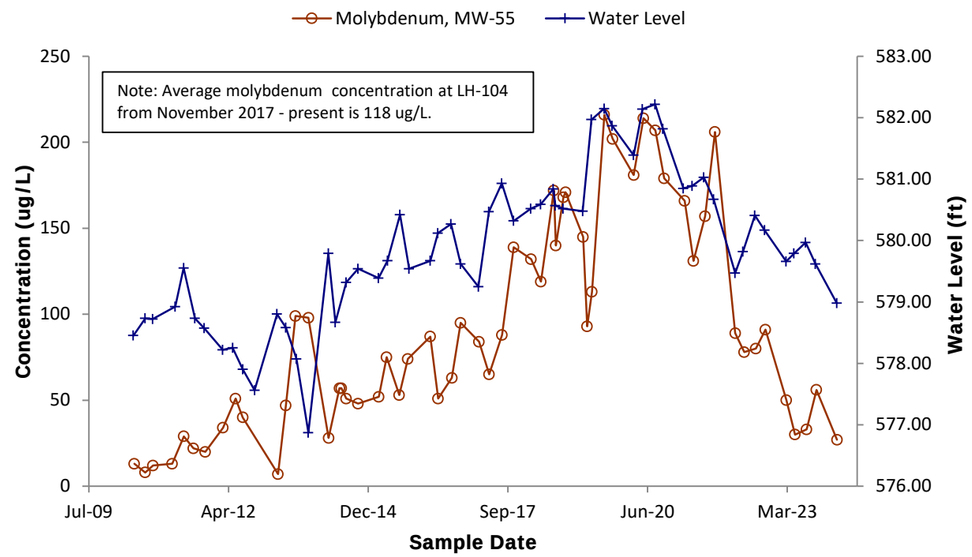
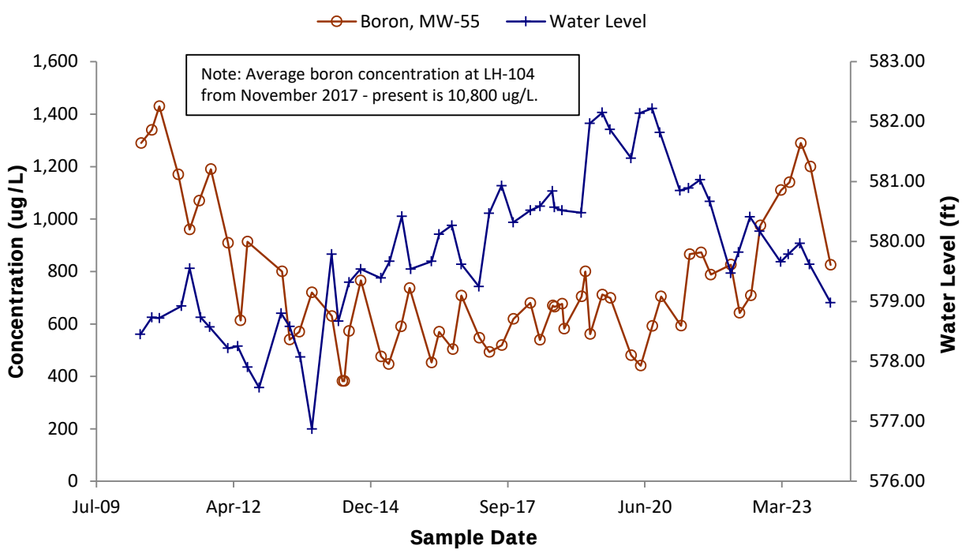
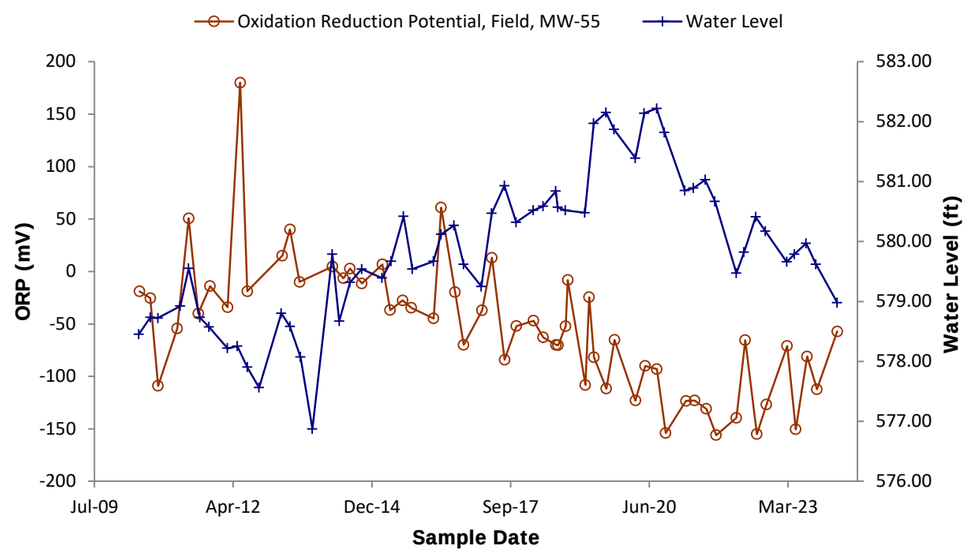


Figure G2: Time Series Plots for MW-55 ASD









Enclosure 2
2024 Semiannual Groundwater Monitoring Report and Second Quarter 2024 Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal Area, Essexville, Michigan. (TRC, July 30, 2024).

2024 Semiannual Groundwater Monitoring Report and Second Quarter 2024 Hydrogeological Monitoring Report

JC Weadock Solid Waste Disposal Area
Essexville, Michigan

July 2024

Prepared For:

Consumers Energy
1945 W. Parnall Road
Jackson, MI 49201

Prepared By:

TRC
1540 Eisenhower Place
Ann Arbor, Michigan 48108

Darby Litz
Project Manager/Hydrogeologist

Kristin Lowery, P.E.
Project Engineer

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 Introduction

Consumers Energy implemented a comprehensive compliance monitoring plan documented in the *Revised Hydrogeological Monitoring Plan* (Natural Resource Technology, 2010) for the JC Weadock Solid Waste Disposal Area as required by Special License Condition 20.b in Solid Waste Disposal Area Operating License No. 9233 issued on October 15, 2009. Since that time, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule) (USEPA, April 2015 as amended) imposing groundwater monitoring and corrective action requirements that apply to the landfill (Weadock Landfill). Subsequently, Michigan amended Part 115 of the Natural Resources and Environmental Protection Act (NREPA) PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management) to provide a basis for establishing a groundwater monitoring system and initiating detection and assessment monitoring to conform requirements for any licensed coal ash impoundment or landfill after December 28, 2018, with Part 115 amendments and the CCR Rule.

On January 15, 2021, Consumers Energy submitted the *Landfill Hydrogeological Monitoring Plan, JC Weadock Power Plant, Essexville, Michigan* (Weadock Landfill HMP), which includes components for Detection Monitoring and Assessment Monitoring, as well as Groundwater Surface Water Interface (GSI) Compliance Monitoring, to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to comply with the requirements of Part 115 and the CCR Rule. The Weadock Landfill HMP (TRC, February 2021) was revised per EGLE comments, submitted, and approved by EGLE on February 19, 2021, and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9640 issued on March 11, 2021.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This Second Quarter 2024 JC Weadock Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring and reporting requirements during the active life of the coal ash landfill. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, dated July 5, 2013 *Format for Solid Waste Disposal Facility Monitoring Submittals*. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the Weadock Landfill HMP that was approved by the EGLE on February 19, 2021. The Weadock Landfill HMP is compliant with Public Act No. 640 of 2018 (PA 640) to amend the NREPA, also known as Part 115 of PA 451 of 1994, as amended (Part 115) (a.k.a., Michigan Part 115 Solid Waste Management).

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the second quarter 2024 at the JC Weadock Solid Waste Disposal Area located at 2742 Weadock Highway

in Essexville, Michigan (Figure 1). This JC Weadock Disposal Area is currently authorized under a permit (Groundwater Discharge Authorization GWE-0005) issued pursuant to Part 31 to discharge to the unusable aquifer directly underlying the solid waste that vents almost immediately to the Saginaw River and Saginaw Bay.

The Weadock Landfill is currently in assessment monitoring pursuant to the CCR Rule. Consumers Energy first reported the potential for statistically significant increases (SSIs) for Appendix III constituents in the *Annual Groundwater Monitoring Report JC Weadock Power Plant Bottom Ash Pond CCR Unit* (TRC, January 2018). The statistical evaluation of the Appendix III indicator parameters confirming SSIs over background were as follows:

- Boron at JCW-MW-15011, JCW-MW-15012, JCW-MW-15023; and
- Field pH at JCW-MW-15023 (high).

On April 25, 2018, Consumers Energy entered assessment monitoring upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. After subsequent sampling for Appendix IV constituents, Consumers Energy provided notice to the Department on January 14, 2019 that arsenic was detected at statistically significant levels above the federal groundwater protection standards (GWPS) established pursuant to §257.95(h) in one monitoring well at the JC Weadock Landfill (JCW-MW-15023), which was located downgradient of a 1,600 linear foot vent within the slurry wall enclosing the historical fly ash disposal area. The vent was designed to direct groundwater flow beneath the landfill to the discharge channel immediately upgradient from the National Pollutant Discharge Elimination System (NPDES) external outfall to prevent water from building up within the facility. In July 2018, this vent was closed (Golder, 2018) and the engineering improvement was approved by the Department (MDEQ, 2018). As a part of the vent closure, monitoring wells JCW-MW-15011, JCW-MW-15012, and JCW-MW-15023 were decommissioned by overdrilling, removing the well material, and sealing the borehole to allow for the slurry wall construction as discussed in the *2018 Annual Groundwater Monitoring Report for the JC Weadock Landfill CCR Unit* (TRC, 2019a). Consumers Energy installed an additional nine monitoring wells in August 2018 to supplement the preexisting Michigan Part 115 compliance groundwater well network and provide appropriate coverage for the collection of groundwater levels and water quality data along the perimeter of the Weadock Landfill, as discussed in the Weadock Landfill HMP. Closing the vent and completely encircling the Weadock Landfill with a soil-bentonite slurry wall has demonstrated reduced groundwater flux around the entire perimeter of the landfill.

In March 2019, Consumers Energy submitted a Response Action Plan (Consumers, 2019), which identified interim response activities taken or to be taken to control possible sources of contamination. Consumers Energy further evaluated arsenic in groundwater at the Weadock Landfill as part of the nature and extent analysis and outlined potential remedies in the *Assessment of Corrective Measures* (TRC, 2019b), which was initiated on April 14, 2019, and completed on September 11, 2019, and focused on materials management with an emphasis on improving source control through the closure plan.

Compliance monitoring is being implemented under the Weadock Landfill HMP dated February 2021 and approved by the EGLE on February 19, 2021. Groundwater data collected in accordance with the Weadock Landfill HMP are used to:

- Assess background groundwater quality for the purposes of establishing and updating GWPS (HMP Section 7.1 Background Determination)
- Perform detection monitoring to assess whether a new release has occurred during operation of the landfill (*i.e.* statistically significant increase (SSI) over background) (HMP Section 7.2 Detection Monitoring)
- Perform assessment monitoring to assess whether constituent concentrations in groundwater from prior operations are above a risk-based standard (*i.e.* statistically significant level over the GWPS) (HMP Section 7.3 Assessment Monitoring)
- Assess compliance with the GSI pathway (HMP Section 7.4)

Consumers Energy also continues to execute the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98 of the CCR Rule, which includes semiannual assessment monitoring in accordance with §257.95. Assessment monitoring data collected in accordance with the CCR Rule is used to assess whether constituent concentrations in groundwater from prior operations are above a risk-based standard (*i.e.* statistically significant level over the Appendix IV GWPS).

1.3 Site Overview

The JC Weadock Solid Waste Disposal Area is located within the former JC Weadock Power Plant (Site), located south of the DE Karn Power Plant, east of the Saginaw River, west of Underwood Drain and Saginaw Bay, and north of Tacey Drain and agricultural land (Figure 1). In addition to the disposal area, the Site consists of the generating facility which retired eight coal-fired generating units and infrastructure and utilities that support electrical transmission. Units 1 to 6 commenced operation in 1940 and retired in 1980 and Units 7 and 8 were added in 1955 and 1958 continued to operate through April 15, 2016.

1.4 Geology/Hydrogeology

The majority of Weadock Landfill area is comprised of surficial CCR and sand fill, as described in the Weadock Landfill HMP. USGS topographic maps and aerial photographs dating back to 1950, in addition to field descriptions of subsurface soil at the Site, indicate that the Site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

The surficial fill consists of a mixture of varying percentages of ash, sand, and clay-rich fill ranging from 5 to 15 feet thick. Below the surficial fill, native alluvium and lacustrine soils are present at varying depths. Generally, there is a well graded sand unit present to depths of 10-30 feet below ground surface (ft bgs) overlying a clay till which is observed at depths ranging from 25-75 ft bgs. A sandstone unit, which is part of the Saginaw Formation, is generally encountered at 80-90 ft bgs. In general, the alluvium soils (sands) are deeper along the Saginaw River and there are shallower lacustrine deposits (clays, silts, and sands deposited in or on the shores of glacial lakes) at other areas. Along the perimeter of the landfill, there is a

well-graded sand unit present at depths ranging from 10 to 20 ft bgs. The sand is variable in thickness, ranging from <1 to ~6.5 feet, and is discontinuous along the landfill perimeter, as evidenced by the soil boring logs and slurry wall construction documentation.

The alluvium soils pinch out and are not observed in soil borings located south and east of the Weadock Bottom Ash Pond and Weadock Landfill, along the location of the historic shoreline. The non-water-bearing region south of these units extends for at least a mile south and southeast of the Site.

Beneath the surficial fill and sand unit (where present) is 70 to 80 feet of clay till. Along the southern perimeter of the landfill, some of the upper portion of the clay till is sand-rich (generally greater than 20 ft bgs). The clay till acts as a hydraulic barrier that separates the shallow groundwater from the underlying sandstone. The sandstone unit, which is part of the Saginaw Formation, is generally encountered at 80-90 ft bgs.

The Weadock Landfill is bounded by several surface water features (Figures 1 and 2): the Saginaw River to the west, a discharge channel and Saginaw Bay (Lake Huron) to the north, Underwood Drain to the east, and Tacey Drain to the south. Groundwater flow in this water bearing zone is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay.

2.0 Leachate Monitoring

The leachate monitoring program consists of an annual laboratory leachate sampling program (Q1) and an annual field leachate sampling program (Q4) per the Weadock Landfill HMP. This program was instituted to maintain the facility under the applicable portions of Part 115, Rule 311 – Leaching tests to evaluate potential for groundwater contamination at unlined industrial waste landfills. Specifically, Subrule (3) states that waste that is disposed of in an industrial waste landfill shall be retested to evaluate potential for groundwater contamination annually or on a more frequent schedule as specified by the solid waste control agency. In addition to field leachate testing conducted annually to evaluate appropriateness of monitored constituents and changes to fate and transport properties, an annual laboratory leachate analysis program was included to better understand what, if any, changes to waste placement may be occurring at the Weadock Landfill based on the addition of air emissions controls and the commingling of air emissions controls residuals (Spray Dry Absorber – SDA) over time. The Weadock Landfill HMP includes the laboratory leachate testing program, consisting of four dry-handled Coal Combustion Residual (CCR) samples commingled with SDA materials collected from each of the disposal silos dedicated to DE Karn Electrical Generating Units 1 and 2. Karn Units 1 & 2 permanently ceased operation on May 31, 2023, so additional CCR and air emissions residuals are not being generated; therefore, there are no results to report for this waste stream. It is noteworthy that the Weadock Landfill continues to receive materials facilitating the closure of the landfill in the form of uncontaminated soil from documented sources, and limited contaminated soil that has been authorized for placement in the Weadock Landfill under the Beneficial Use 3 designation as other materials designated for construction at a licensed solid waste disposal facility. These results are maintained with the closure certification documentation.

Additional support for evaluating the potential for groundwater contamination at the unlined industrial waste landfill includes the field leachate monitoring program conducted during the fourth quarter of each year. This program consists of an annual sampling collection from two (2) leachate headwells; LH-103R and LH-104. This program was implemented to determine constituents in the leachate as measured under actual conditions in the field and to assess which constituents have the potential to exceed applicable criteria at the compliance well locations.

There are no leachate data to report this quarter.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

The groundwater monitoring system presented in the Weadock Landfill HMP has been established in accordance with R 299.4906 and the CCR Rule §257.91 and consists of 27 monitoring wells (four background monitoring wells, 12 downgradient monitoring wells, and 11 additional wells used for static water level measurements only) that are screened in the uppermost aquifer. The monitoring well network has been designed to provide appropriate coverage for water level and water quality data collection along the perimeter of the landfill. The monitoring well locations are shown on Figure 2. Monitoring well specifications and purpose (i.e. static water level monitoring, groundwater quality monitoring, or GSI monitoring) are included in Table 1.

The Weadock Landfill HMP groundwater monitoring system consists of the following:

- ***Background Groundwater Quality:*** Four monitoring wells located southwest of the Weadock Landfill provide data on background groundwater quality that has not been affected by the CCR unit (MW-15002, MW-15008, MW-15016, and MW-15019) and are used to establish groundwater protection standards (GWPSs) for the landfill:
  - MW-15002 – MW-15008 – MW-15016 – MW-15019
- ***Downgradient Groundwater Quality:*** The twelve downgradient monitoring wells, located on the outside of the perimeter slurry wall include:
  - JCW-MW-18001 – JCW-MW-18004 – JCW-MW-18005 – JCW-MW-18006
  - MW-50 – MW-51 – MW-52 – MW-53
  - MW-53R – MW-54R – MW-55 – OW-57R Out
- ***Groundwater-Surface Water Interface (GSI) Monitoring***: Monitoring wells located along the surface water features adjacent to the Weadock Landfill are included in the monitoring program to meet the requirements of Part 31. Locations and alignments were established in the Phase II Groundwater Discharge Evaluation, Figure: Appendix K (Natural Resource Technology, 2005) as a baseline for monitoring future results. These monitoring wells are screened across the water table of the uppermost aquifer and serve as GSI monitoring wells to determine compliance with generic GSI criteria or site-specific mixing zone-based criteria as appropriate. The eight GSI compliance monitoring wells include:
  - MW-50 – MW-51 – MW-52 – MW-53
  - MW-53R – MW-54R – MW-55 – JCW-MW-18004
- ***Static Water Level Measurement Only:*** Eleven additional monitoring wells, located on the inside of the perimeter slurry wall, at paired locations with several of the downgradient monitoring wells include:
  - JCW-OW-18001 – JCW-OW-18002 – JCW-MW-18003 – JCW-MW-18004
  - JCW-MW-18005 – JCW-MW-18006 – MW-20 – OW-51
  - OW-53 – OW-54 – OW-55 – OW-56R
  - OW-57R IN – OW-61 – OW-63

3.2 May 2024 Monitoring Event

In accordance with the Weadock Landfill HMP, TRC conducted the second quarter 2024 monitoring event for the Weadock Landfill by collecting water levels and groundwater samples on May 6 through 8, 2024. Samples that were collected during this event were submitted to Consumers Energy Laboratory Services in Jackson, Michigan for analysis of total metals and inorganic parameters. Radium analysis was performed by Eurofins Environment Testing in Earth City, Missouri. Semiannual monitoring constituents include:

Section 11511a(3)(c) – Detection Monitoring Constituents	Section 11519b(2) – Assessment Monitoring Constituents	
Boron	Antimony	Lithium
Calcium	Arsenic	Mercury
Chloride	Barium	Molybdenum
Fluoride	Beryllium	Nickel
Iron	Cadmium	Selenium
pH	Chromium, total	Silver
Sulfate	Cobalt	Thallium
Total Dissolved Solids (TDS)	Copper	Vanadium
	Fluoride	Zinc
	Lead	Radium 226/228

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, and bicarbonate, carbonate, and total alkalinity. Analytical results from the monitoring event are included in the attached laboratory reports (Appendix E).

Static water level measurements were collected at all locations after equilibration to atmospheric pressure and immediately prior to purging. The depth to water was recorded to the nearest 0.01-ft in accordance with the procedures in the Weadock Landfill HMP. Groundwater purging and sampling were conducted in accordance with low-flow sampling protocol. Static water elevation data are included in the attached field records (Appendix F).

Groundwater samples were collected using a peristaltic pump. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Groundwater sample preparation and analyses were performed in accordance with SW-846 “Test Methods for Evaluation Solid Waste – Chemical / Physical Methods,” USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of two field blanks, one equipment blank, three field duplicates (MW-15008, JCW-MW-18006, and MW-50), and one field matrix spike/matrix

spike duplicate sample pair (JCW-MW-18001).

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The laboratory data were found to be complete and usable for the purposes of the Weadock Landfill HMP. The data quality reviews for the JC Weadock Disposal Area network wells are summarized in Appendix B.

3.3 Groundwater Flow Rate and Direction

Potentiometric monitoring in the unusable aquifer beneath the facility includes static water level data collected for development of water table contours and evaluation of the potential for discharge from the facility. The monitoring under this section will be conducted quarterly until closure, as approved by the Director, and semiannually during the 30-year post-closure period. Monitoring will continue until the end of post closure (30 years) or as otherwise approved by the Director.

The measurements for top of casing (TOC) and recorded depth to water (DTW) with corresponding calculated static water level (SWL) is tabulated and presented in Table 1. A potentiometric surface map is provided as Figure 3.

Groundwater elevations measured at the Site in May 2024 are generally within the range of 579 to 596 feet above mean sea level (ft NAVD88). Groundwater elevations in monitoring wells located adjacent to Saginaw Bay and adjoining surface water bodies are typically encountered at a similar or slightly higher elevation relative to surrounding surface water features measured by the NOAA gauging station. A time-series plot included in Appendix A compares the groundwater elevation of at the GSI monitoring wells (MW-50, MW-51, MW-52, MW-53, MW-54R, JCW-MW-18004, and MW-55) to the nearby NOAA staff gauge. Water levels in wells adjacent to surface water bodies (e.g. Saginaw Bay, Tacey Drain) closely mirror the surface water elevation. Such conditions would result in a minimal gradient to potentially a reverse gradient (i.e., toward the landfill) between the well and the drain which would result in minimal to zero mass flux to the drain (Appendix A: Table A1).

The groundwater monitoring system is structured such that there are eleven monitoring well pairs used to evaluate the hydraulic gradient and potential for water flux across the slurry wall. Static water level observations from the paired wells are shown on time series charts in Appendix A. The static water level elevations inside of the Weadock Landfill perimeter slurry wall are generally significantly different (>3 ft) than static water levels outside of the slurry wall, which demonstrates the presence of a low permeability feature between the well pairings inside and outside of the constructed slurry wall. As such, the water level elevations indicate that the slurry wall is performing as designed. The general flow direction observed within the confinement of the slurry wall is similar to that identified in previous monitoring rounds. Due to the potential for radial flow, the downgradient wells are appropriately positioned to detect the presence of detection or assessment parameters that could potentially migrate from the Weadock Landfill. As shown on Figure 3 and in Appendix A, the static water level outside of the

slurry wall is lower than the static water level inside of the wall; therefore, the potential groundwater flux across the slurry wall was calculated and included in Table A2 of Appendix A.

3.4 Groundwater Analytical Data and Relevant Screening Criteria

Groundwater analytical data are evaluated in accordance with the Weadock Landfill HMP to determine the effectiveness of landfill structural and operational enhancement measures on the quality and quantity of groundwater flow beneath the footprint of the facility (Section 3.4.1 Detection Monitoring and Section 3.4.2 Assessment Monitoring). Additionally, analytical results are evaluated in support of GSI compliance. GSI criteria only apply to the designated compliance point as specified in Section 3.4.3 below; however, analytical results and data trends in groundwater collected from the perimeter dike wells are evaluated to identify potential GSI compliance issues. Data are evaluated by using a combination of screening against relevant criteria, as well as utilizing statistical analyses.

Analytical results from the second quarter 2024 monitoring event are included in the attached laboratory report (Appendix E). Groundwater analytical data from the second quarter 2024 monitoring event are summarized in Table 3 (background monitoring wells) and Table 4 (Weadock Landfill Monitoring Wells), as well as the associated Part 201 generic GSI and site-specific mixing-zone GSI criteria. Field data are summarized in Table 2.

Mixing-zone criteria for arsenic, boron, and selenium are provided for the Karn-Weadock complex in the mixing zone determination, dated December 23, 2015 (MDEQ, 2015). As such, arsenic, boron, and selenium are compared to site-specific mixing zone-based GSI criteria, and all other constituents are screened against generic GSI criteria. All data are screened against GSI criteria; however, compliance with GSI criteria is determined at select monitoring locations as noted in Section 3.4.3 below.

The mixing zone determination included both final acute values (FAV) and final chronic values (FCV). If a concentration of a constituent at a groundwater well exceeds the acute criteria, and the exceedances are upgradient of the GSI compliance monitoring wells, Consumers Energy must demonstrate that data from all of the compliance monitoring wells are, and will be, in compliance with acute mixing zone-based GSI criteria for those parameters. Averaging of groundwater data is not allowed for comparison to generic GSI or acute mixing zone-based GSI criteria. Acute mixing zoned-based or generic GSI criteria may not be exceeded in any individual GSI compliance monitoring well. If a concentration of a constituent at a well exceeds the chronic criterion, compliance can be demonstrated on a mass-flux basis. The facility can choose to demonstrate compliance by evaluating the total chronic loading based upon the contribution from each compliance well with respect to the total flux observed in the mixing zone.

Table 6 provides a summary of the statistically significant increases or exceedances over the most recent four quarters in accordance with the EGLE-prescribed format; only well/constituent pairs that exceed the relevant Part 115 compliance standard – the GSI pathway standard (Section 3.4.3) within the last four quarters are included.

3.4.1 Detection Monitoring

Detection monitoring is continuing through the active life of the Weadock Landfill to monitor for new releases from landfill operations. The detection monitoring program consists of potentiometric analysis and groundwater quality analysis. The potentiometric analysis, as discussed in Section 3.3, demonstrates that the slurry wall is performing as designed.

In addition to the comparison of analytical data to relevant screening criteria (Table 4), statistical trend analyses are used to evaluate groundwater quality each quarter. Consumers Energy manages and evaluates its groundwater data using Sanitas™ Statistical Software. Consumers Energy conducts intrawell trend analyses to examine data for a given well over time to determine if changes in water quality are occurring that may be associated with the landfill and to identify potential GSI compliance issues. Specifically, the Mann-Kendall test for trend was performed at a significance level (α) of 0.025 per tail for each constituent/sampling point dataset to assess trends. Sen's Slope estimator was used to assess the magnitude of the slope and the Mann-Kendall test was used to determine if the trend was statistically significant.

Appendix C includes a table summarizing the results of the trend tests as well as the Sanitas™ output summary statistics and graphs. Data are stable or declining for the majority of the well/constituent pairs, with the following exceptions:

- A new, unconfirmed increasing trend for boron was observed at MW-53 in Q2 2024.
- New, unconfirmed upward trends in calcium at JCW-MW-18006 and OW-57R OUT were observed in Q2 2024.
- The increasing trend for calcium at JCW-MW-18001 continued in Q2 2024.
- The increasing trend for iron at JCW-MW-18001 continued in Q2 2024.
- New, unconfirmed increasing trends in pH were observed at monitoring wells JCW-MW-18006, MW-53R, and OW-57R OUT in Q2 2024.
- The increasing trend for sulfate at JCW-MW-18001 continued in Q2 2024.
- The new increasing trend for sulfate that was observed at JCW-MW-18006 in Q1 2024 was confirmed this quarter.
- A new, unconfirmed increasing trend for total dissolved solids was observed at JCW-MW-18006 in Q2 2024.

Although increasing trends for detection monitoring constituents were observed, individual constituent trends provide a *potential indication* that there may be a release coming from the monitored unit. When these indicator trends are evaluated with other co-monitored conditions and parameters at the Weadock Landfill, the increasing trends for detection monitoring constituents do not appear to be a result of a new release from operation of the landfill. The potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill. Several of these recently observed trends, such as those observed for calcium, iron, and sulfate at JCW-MW-18001 and sulfate at JCW-MW-18006 are likely a result of localized geochemical changes influenced by changes in water levels rather than a change in flux from the landfill and will continue to be evaluated. The increasing trends of calcium and sulfate in JCW-MW-18001 have resulted in statistically significant GWPS

exceedances, as noted in Section 3.4.2; however, an alternate source demonstration for these constituents is presented in Section 3.5. Additionally, iron, calcium, and sulfate concentrations in each of the GSI compliance monitoring wells remain below the relevant Part 115 compliance standard – the GSI pathway standard.

Consumers is further evaluating possible causes of the increasing boron concentrations at several porewater compliance monitoring wells. Previous studies (NRT, 2005) documented boron at significantly elevated concentrations at the Karn-Weadock Power Generating Complex. Boron was also identified as an SSI over background levels in the 2017 *Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit* (TRC, 2018) and was one of the detection monitoring constituents that triggered the initiation of the assessment monitoring program. Statistical significance above the GWPS established for boron has been noted for these monitoring wells per the Part 115 groundwater monitoring program requirements, as discussed in Section 3.4.2.2. Continued monitoring and assessment for potential future actions is warranted at this time; however, observed concentrations of boron in each of the monitoring wells are less than the relevant Part 115 compliance standard – the GSI pathway standard (Section 3.4.3).

3.4.2 Assessment Monitoring Data Evaluation

Assessment monitoring is continuing at the Weadock Landfill in accordance with the Weadock Landfill HMP and §257.95. The assessment monitoring data were statistically evaluated in accordance with the procedures in the Weadock Landfill HMP. The statistical evaluation details are provided in Appendix D. A summary of the confidence interval evaluation is provided in Table 5.

3.4.2.1 Establishing Groundwater Protection Standards

The GWPSs are used to assess constituent concentrations present in groundwater as a result of CCR unit operations by statistically comparing concentrations in the downgradient wells to each of the respective GWPSs for each detection and assessment monitoring constituent. The calculation of the GWPSs in accordance with the Weadock Landfill HMP is documented in the *Groundwater Protection Standards* technical memorandum included as Appendix H of the *First Quarter 2021 Hydrogeological Monitoring Report* (TRC, 2021b). The Federal CCR Rule requires establishment of GWPSs for assessment monitoring (Appendix IV) constituents only. Part 115 requires establishment of GWPSs for both detection and assessment monitoring constituents.

3.4.2.2 Data Comparison to Groundwater Protection Standards

Consistent with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009) and the Weadock Landfill HMP, the preferred method for comparisons to a fixed standard are confidence limits. An exceedance of the standard occurs when the 99 percent lower confidence level of the downgradient data exceeds the GWPS.

Detection Monitoring Constituents (Part 115): The second quarter 2024 statistical evaluation indicates that boron at JCW-MW-18001, JCW-MW-18005, JCW-MW-18006, MW-50, MW-52, MW-53, MW-53R, MW-54R, MW-55, and OW-57R OUT, calcium at JCW-MW-18001, and sulfate at JCW-MW-18001 were present at statistically significant levels above the GWPS. Boron was one of the Appendix III SSIs that originally triggered assessment monitoring. Boron concentrations have been consistently above the GWPS but less than the chronic-based mixing zone-based GSI criterion of 44,000 ug/L within the Weadock Landfill monitoring well network since monitoring under the Weadock Landfill HMP began in first quarter 2021.

Calcium at JCW-MW-18001 was present at statistically significant levels above the GWPS beginning in first quarter 2023 resulting from increases in calcium concentration since first quarter 2021. Sulfate was present at JCW-MW-18001 at statistically significant levels above the GWPS for the first time in second quarter 2023 due to increasing concentrations. Consumers is asserting an ASD for the increases in calcium and sulfate at JCW-MW-18001, as detailed in Section 3.5.

The GWPSs for boron, calcium, and sulfate were established based on background concentrations observed in wells unaffected by the Weadock Landfill or Weadock Bottom Ash Pond. Detection monitoring (i.e., Appendix III) constituents do not have associated health-based criteria and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. Overall, data continue to demonstrate compliance with the applicable GSI criteria, as discussed in Section 3.4.3.

Assessment Monitoring Constituents (Part 115 and Federal CCR): Based on the second quarter 2024 statistical evaluation, there are no assessment monitoring constituents present at statistically significant levels above the GWPSs within the Weadock Landfill groundwater monitoring system. Although concentrations of arsenic and molybdenum at MW-55 observed during individual sampling events are above the GWPS, the elevated concentrations of those constituents are not a result of a release from the Weadock Landfill, as detailed in Section 3.5. The head differential of 9.53 feet between OW-55 inside the slurry wall and MW-55 outside of the slurry wall also suggests that the integrity of the slurry wall is maintained and groundwater flow from the landfill to the south is impeded by the low permeability of the slurry wall. Groundwater conditions at MW-55 will continue to be monitored.

3.4.3 GSI Compliance Monitoring

The GSI monitoring program consists of the eight monitoring points located along the surface water features:

- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- JCW-MW-18004

Second quarter 2024 data from the GSI monitoring points are tabulated in Table 4. As described in the Weadock Landfill HMP, GSI monitoring program constituents were identified as detected constituents that have the potential to exceed the generic GSI criteria at the Weadock Landfill downgradient monitoring wells. At a minimum, these constituents include the following, identified based on prior groundwater monitoring as noted in the Weadock Landfill HMP:

- Boron
- pH
- Arsenic
- Lithium
- Selenium
- Iron
- Sulfate
- Chromium
- Molybdenum
- Vanadium

Additional constituents will be added to the GSI monitoring program as appropriate if detected above the relevant GSI criteria at the landfill monitoring wells in two consecutive events. Calcium, chloride, and total dissolved solids have been detected above the generic GSI criteria in one or more wells over two consecutive events; however, it is not appropriate to add these constituents to the GSI monitoring program for the following reasons:

- **Calcium:** Calcium has been detected above the generic GSI criterion at JCW-MW-18001. As discussed further in Section 3.5, the concentrations of calcium at JCW-MW-18001 are attributed to localized changes in geochemistry and are not indicative of a new release from the landfill. Concentrations in all other wells remain below the generic GSI criterion, supporting that the detected concentrations are localized to JCW-MW-18001. Given that JCW-MW-18001 is not a GSI compliance monitoring location and the increase in calcium is not attributed to the landfill operation, it is not appropriate to add calcium to the GSI compliance monitoring program.
- **Chloride:** Chloride has been detected above the generic GSI criterion of 50 mg/L in several wells. Chloride is regionally elevated, as evidenced by the calculated background concentration of 2,300 mg/L, documented in the *Groundwater Protection Standards* technical memorandum included as Appendix H of the *First Quarter 2021 Hydrogeological Monitoring Report* (TRC, 2021b). Consistent with the *Groundwater-Surface Water Interface Pathway Compliance Options* (MDEQ, 2018a) resource materials, where the background concentration is greater than the risk-based GSI criterion, the background concentration may be substituted for the GSI criterion. All chloride concentrations are below the background concentration. Therefore, chloride is determined to be below the applicable level and is not included in the GSI compliance monitoring program.
- **Total Dissolved Solids:** Total dissolved solids (TDS) has been detected above the generic GSI criterion of 500 mg/L in several wells. TDS is regionally elevated, as evidenced by the calculated background concentration of 4,700 mg/L, documented in the *Groundwater Protection Standards* technical memorandum included as Appendix H of the *First Quarter 2021 Hydrogeological Monitoring Report* (TRC, 2021b). Consistent with the *Groundwater-Surface Water Interface Pathway Compliance Options* (MDEQ, 2018a) resource materials, where the background concentration is greater than the risk-based GSI criterion, the background concentration may be substituted for the GSI criterion. All TDS concentrations are below the background concentration. Therefore, TDS is determined to be below the applicable level and is not included in the GSI compliance monitoring program.

The confidence interval calculations are provided in Appendix D. The confidence interval test compares the lower confidence limit to the GSI. Overall, data continue to demonstrate compliance with the applicable GSI criteria.

- **Boron:** The assessment monitoring statistical evaluation found that boron was present at statistically significant levels above the GWPS at JCW-MW-18001, JCW-MW-18005, JCW-MW-18006, MW-50, MW-52, MW-53, MW-53R, MW-54R, MW-55, and OW-57R OUT. Boron is a detection monitoring (i.e. Appendix III) constituent and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. All observations of boron are less than the recommended mixing-zone based GSI value specified in Table 3 of the *Implementation of a Mixing Zone Request, Consumers Energy DE Karn/JC Weadock Complex* (MDEQ, 2015) (Appendix D: Table 2).
- **Sulfate:** The detection monitoring statistical evaluation found that sulfate concentrations were increasing at JCW-MW-18001 and JCW-MW-18006. The assessment monitoring statistical evaluation found that sulfate was present at statistically significant levels above the GWPS at JCW-MW-18001, while sulfate concentrations at JCW-MW-18006 are below the GWPS. Sulfate is a detection monitoring (i.e. Appendix III) constituent and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. All observations of sulfate are less than the applicable GSI criterion (Appendix D: Table 2).
- **Iron:** The detection monitoring statistical evaluation found that iron concentrations were increasing at JCW-MW-18001. The assessment monitoring statistical evaluation found that iron concentrations at JCW-MW-18001 are below the GWPS. Iron is a detection monitoring (i.e. Appendix III) constituent and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. All observations of iron are less than the applicable GSI criterion (Appendix D: Table 2).
- **Arsenic and Molybdenum at MW-55:** Concentrations of arsenic and molybdenum at MW-55 have at times exceeded the GSI criteria on a direct comparison to the fixed limit basis (Appendix D: Table 2).[1] The second quarter 2024 sampling event results show that both arsenic and molybdenum concentrations are below applicable GSI criteria. The statistical evaluation presented in Appendix D shows that the lower confidence limit of the arsenic data over the past 8 events does not exceed the GSI criterion. Molybdenum concentrations have not directly exceeded the GSI criterion within the past 8 events; therefore, confidence limits were not calculated. Additionally, water levels in MW-55 closely mirror the surface water elevation measured at the NOAA gauging station, which indicates there is a minimal outward gradient to a potentially, modest reverse gradient (i.e., toward the landfill) between the monitoring well and the drain, resulting in a minimal to zero mass flux to the drain (Appendix A).

3.5 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed below:

- Calcium and sulfate in monitoring well JCW-MW-18001; and
- Arsenic and molybdenum in monitoring well MW-55.

The groundwater conditions do not conclusively indicate a release from the unit for several reasons as detailed below.

[1] Molybdenum was last observed at a concentration above the GSI criterion in fourth quarter 2021.

3.5.1 Monitoring Well JCW-MW-18001: Calcium and Sulfate

Although confirmed increasing trends were observed at JCW-MW-18001 for calcium and sulfate (through Q2 2024), these trends are not indicative of a new release from the landfill. Calcium and sulfate are two of several constituents that contribute to the overall TDS concentration and increasing calcium and sulfate concentrations could result in an increase in TDS as well. Although, TDS concentrations are not currently exhibiting a statistically significant upward trend, TDS concentrations have been increasing in past events and the data are discussed as part of this ASD. Increases of calcium, sulfate, and TDS concentrations at JCW-MW-18001 are attributed to changes occurring outside of the slurry wall as a result of changing water levels, rather than a change in flux from the landfill; therefore, Consumers Energy is continuing to assert an ASD for these constituents. The following lines of evidence as well as additional time series charts included in Appendix G support this ASD:

- The potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill (Appendix A).
- Concentration data also support that the slurry wall is effective in reducing the flux of groundwater from the landfill, based on the following observations (Appendix G1):
  - JCW-MW-18001 was installed after the 1,600 linear foot gap in the landfill perimeter slurry wall was closed, as discussed in Section 1.2. Prior to the slurry wall expansion in July 2018, monitoring well JCW-MW-15023 was located within the gap of the slurry wall and was sampled between December 2015 and May 2018 as a part of the original Federal CCR program monitoring well network. The groundwater quality data collected from JCW-MW-15023 shows that groundwater in contact with CCR managed within the landfill was high in arsenic, and low in sulfate, calcium, and TDS (Appendix G1).
  - To accommodate the July 2018 slurry wall expansion, JCW-MW-15023 was decommissioned. Once slurry wall construction was completed, JCW-MW-18001 was installed within 10-ft of the location of the former JCW-MW-15023 well, on the discharge channel side of the slurry wall. Additionally, an observation well, JCW-OW-18001, was installed on the landfill side of the slurry wall to monitor water levels to assess the effectiveness of the hydraulic control. Both JCW-MW-18001 (outside) and JCW-OW-18001 (inside) have been sampled recently to assess concentration trends.
    - Concentrations of arsenic are much higher inside of the slurry wall, within the landfill, while arsenic concentration remain low on the outside of the landfill.
    - Concentrations of calcium, sulfate, and TDS are much lower on the inside of the slurry wall and are higher outside of the slurry wall.
- These combined lines of evidence support that increasing concentrations of calcium, sulfate, and TDS are not a result of a change in flux from the landfill and instead are a result of changing groundwater conditions on the outside of the slurry wall.

3.5.2 Monitoring Well MW-55: Arsenic and Molybdenum

Additionally, Consumers Energy is continuing to assert an ASD for arsenic and molybdenum at MW-55 indicating elevated levels of constituents at that location are not related to materials management of the Weadock Landfill (*2021 Annual Groundwater Monitoring and Corrective Action Report*; TRC, January 2022). The basis for this ASD is summarized below and updated

time series plots in support of this ASD are included in Appendix G (Figure G2).

Data collected from the 2018 investigation as well as data collected during routine sampling events for Part 115 and Federal CCR groundwater compliance show the following:

- **Distinct Chemistry from Leachate –** The leachate chemistry from a monitoring well screened at the base of the ash fill (LH-104) is distinctly different from the groundwater chemistry near MW-55 and the temporary monitoring wells installed by TRC in the investigation area, as illustrated Appendix G of the 2019 Annual Groundwater Monitoring and Corrective Action Report (TRC, January 2020). Additionally, concentrations of arsenic are generally much lower, and concentrations of boron are much higher within the landfill (LH-104) than outside of the landfill at MW-55 (Figure G2).
- **Conservative Tracer –** Boron is a metalloid known to be present in coal ash and can be used as a conservative tracer in groundwater. The average concentration of boron in Leachate Headwell LH-104 (10,800 ug/L: November 2017 - October 2023) is significantly higher than concentrations observed at any of the other locations sampled as a part of this monitoring program. Additionally, recently observed boron concentrations at MW-55 are similar to or lower than historical concentrations, which further supports that the water quality at MW-55 is not directly affected by groundwater migrating from the landfill.
- **Reducing Conditions and Groundwater Head Levels –** Water levels observed at MW-55, as shown in Appendices A and G, increased over 4-ft between 2010 and 2020. The oxidation-reduction potential (ORP) at MW-55 has generally decreased (i.e., is more reducing) since 2010. The lowering of ORP over time as a result of increased water levels has changed the geochemical conditions in the vicinity of MW-55 and has resulted in increased solubility of arsenic and molybdenum. Since 2021, water levels have been generally decreasing, resulting in a slight increase in ORP (i.e., is less reducing) and decreases in concentrations of both arsenic and molybdenum, which further illustrates the relationship between groundwater elevations, redox state, and concentration of arsenic and molybdenum in groundwater.

4.0 Conclusions and Recommendations

Detection monitoring is continuing through the active life of the Weadock Landfill to monitor for new releases from landfill operations. The detection monitoring program consists of potentiometric analysis and groundwater quality analysis. Evaluation of the second quarter 2024 data demonstrate that the slurry wall is functioning as designed.

The Weadock Landfill is currently in assessment monitoring pursuant to the CCR Rule, as discussed in the *2023 Annual Groundwater Monitoring and Corrective Action Report*, due to observed groundwater concentrations that are indicative of impact from past landfill operations. Evaluation of the second quarter 2024 data in accordance with the Weadock Landfill HMP demonstrate that boron, calcium, and sulfate are present at concentrations above the GWPSs. Boron, calcium, and sulfate are detection monitoring (i.e., Appendix III) constituents that do not have associated health-based criteria and there is not a complete drinking water pathway on-site. As such, the relevant Part 115 compliance pathway is the GSI pathway. The statistical evaluation in second quarter 2024 found that no constituents were present at statistically significant levels above applicable GSI criteria.

Therefore, Consumers Energy will continue with the detection and assessment monitoring as required by the CCR rule as well as the monitoring program relative to the implementation of the site-specific mixing zone authorization at the Weadock Landfill unit in conformance with the JC Weadock Landfill HMP. The second quarter monitoring event for is scheduled for July 2024.

5.0 References

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Tables

Table 1
Summary of Groundwater Elevation Data
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)			May 6, 2024	
						Depth to Water (ft BTOC)	Groundwater Elevation (ft)
Background Monitoring Wells							
MW-15002	587.71	Sand	580.9	to	570.9	6.65	581.06
MW-15008	585.36	Sand with clay	578.7	to	568.7	4.25	581.11
MW-15016	586.49	Sand	581.2	to	578.2	3.45	583.04
MW-15019	586.17	Sand and Sand/Clay	579.5	to	569.5	5.23	580.94
Bottom Ash Pond: Downgradient Monitoring Wells							
JCW-MW-15007	587.40	Sand	582.7	to	579.2	3.25	584.15
JCW-MW-15009	589.64	Sand	581.9	to	576.9	8.85	580.79
JCW-MW-15010	597.76	Sand	579.7	to	578.2	17.38	580.38
JCW-MW-15028	589.64	Sand	567.7	to	564.7	7.30	582.34
Landfill: Downgradient Monitoring Wells (outside slurry wall)							
JCW-MW-18001	596.73	Sand and Sandy Clay	578.3	to	573.3	17.08	579.65
JCW-MW-18004	593.04	Sandy Clay	583.9	to	578.9	12.38	580.66
JCW-MW-18005	590.89	Sand and Sandy Clay	580.0	to	575.0	8.50	582.39
JCW-MW-18006	600.72	Fly Ash and Sandy Clay	582.8	to	577.8	12.40	588.32
MW-50	593.36	Sand	577.8	to	574.8	13.65	579.71
MW-51	594.29	Sand and Clay	577.8	to	574.8	14.45	579.84
MW-52	594.90	Sand	579.3	to	576.3	15.10	579.80
MW-53	593.68	Sand and Clay	579.1	to	576.1	13.85	579.83
MW-53R	594.25	Sand and Clay	580.4	to	575.4	14.50	579.75
MW-54R	593.89	Clay and Sand	581.3	to	576.3	13.92	579.97
MW-55	593.82	Sand	581.5	to	578.5	14.10	579.72
OW-57R OUT	591.00	Sandy Clay	577.0	to	572.0	8.21	582.79
Landfill: Static Water Level Only (inside slurry wall)							
JCW-OW-18001	595.84	Fly Ash and Sand	581.1	to	576.1	6.56	589.28
JCW-OW-18002	593.63	Sand	578.9	to	573.9	10.40	583.23
JCW-OW-18003	593.99	Sand and Clay	580.5	to	575.5	6.24	587.75
JCW-OW-18004	594.19	Sandy Clay	584.6	to	579.6	6.22	587.97
JCW-OW-18006	600.61	Fly Ash and Clay with Sand	582.9	to	577.9	6.53	594.08
MW-20	592.73	NR	~581.1	to	~578.1	6.35	586.38
OW-51	593.62	Clay and Sand	578.9	to	575.9	9.10	584.52
OW-53	593.64	Clay and Sand	579.0	to	576.0	7.40	586.24
OW-54	594.10	Clay and Sand	580.0	to	577.0	7.19	586.91
OW-55	594.67	Clay (or Sand and Clay)	580.9	to	577.9	6.26	588.41
OW-56R	592.01	Ash and Sand	577.5	to	572.5	5.68	586.33
OW-57R IN	590.86	Sandy Clay	575.7	to	570.7	5.26	585.60
OW-61	602.15	Ash and Sand	588.0	to	585.0	6.40	595.75
Landfill: Leachate Headwells							
LH-103R	612.70	Fly Ash	30.2	to	33.2	20.69	592.01
LH-104	596.56	Fly Ash	8.0	to	11.0	8.00	588.56

Notes:

Survey data from: Rowe Professional Services Company (Nov. 2015) and Consumers Energy Company drawings: SG-21733, Sheet 1, Rev. G (Karn, 11/27/18); and SG-21733, Sheet 2, Rev. C (Weadock, 11/27/18).

Elevation in feet relative to North American Vertical Datum 1988 (NAVD 88).

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

Table 2
Summary of Field Parameters
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Background							
MW-15002	5/8/2024	1.25	-111.5	7.7	495	12.7	8.5
MW-15008	5/8/2024	0.70	-125.5	7.0	1,760	11.5	10.0
MW-15016	5/8/2024	0.69	-117.5	7.1	1,762	12.5	9.9
MW-15019	5/8/2024	0.77	-104.5	7.0	2,044	10.0	5.8
Weadock Landfill							
JCW-MW-18001	5/7/2024	0.76	-131.0	6.8	3,457	10.3	5.4
JCW-MW-18004	5/8/2024	8.65	20.0	6.9	1,398	9.9	6.0
JCW-MW-18005	5/8/2024	0.83	-103.8	6.8	1,569	10.7	10.0
JCW-MW-18006	5/8/2024	0.75	-155.8	7.1	1,324	13.7	9.9
MW-50	5/7/2024	0.75	-142.5	7.5	1,455	10.0	5.4
MW-51	5/7/2024	0.83	-141.0	7.4	1,269	9.5	6.9
MW-52	5/7/2024	0.79	-119.5	7.0	1,717	10.6	5.2
MW-53	5/7/2024	0.79	-173.5	7.5	1,176	10.8	7.9
MW-53R	5/7/2024	0.84	-149.0	7.1	1,266	11.6	6.9
MW-54R	5/7/2024	2.95	-105.3	7.2	1,127	11.9	7.0
MW-55	5/8/2024	0.84	-107.5	6.9	1,236	10.0	8.0
OW-57ROUT	5/8/2024	2.25	-95.0	7.2	1,223	12.2	9.5

Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard Units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celsius.

NTU - Nephelometric Turbidity Unit.

(1) The water quality meter used at this well location was determined to have a bias towards elevated dissolved oxygen readings.

Table 3
Summary of Groundwater Sampling Results (Analytical)
DE Karn JC Weadock Background - RCRA CCR Monitoring Program
Essexville, Michigan

					Sample Location:	**MW-15002**	**MW-15008**	**MW-15016**	**MW-15019**
					Sample Date:	5/8/2024	5/8/2024	5/8/2024	5/8/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Background			
Appendix III[(1)]									
Boron	ug/L	NC	500	500	4,000	21	142	398	241
Calcium	mg/L	NC	NC	NC	500[EE]	55.9	121	243	173
Chloride	mg/L	**250****	**250[E]**	**250[E]**	**50**	28.3	**395**	**175**	**374**
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250[E]	250[E]	500[EE]	7.53	2.57	194	93.8
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	358	**1,280**	**1,190**	**1,340**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5[E]	6.5 - 8.5[E]	6.5 - 9.0	7.7	7.0	7.1	7.0
Appendix IV[(1)]									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	< 1	3	**17**	2
Barium	ug/L	2,000	2,000	2,000	1,200	43	93	157	364
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	1	1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	< 10	22	68	14
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.0742	0.589	< 0.149	0.332
Radium-228	pCi/L	NC	NC	NC	NC	< 0.512	< 0.847	< 0.715	< 0.638
Radium-226/228	pCi/L	5	NC	NC	NC	< 0.512	1.03	< 0.715	0.822
Selenium	ug/L	50	50	50	5.0	< 1	< 1	1	< 1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]									
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	**526**	**16,900**	**21,900**	**23,100**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	2	1	2	< 1
Nickel	ug/L	NC	100	100	120	2	4	10	5
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	**4.5**	62	27	< 2	**9**	2	3
Zinc	ug/L	5,000**	2,400	5,000[E]	260	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

** - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. Chromium GSI criterion based on hexavalent chromium per footnote {H}. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}. GSI criterion for chloride is 50 mg/L when the discharge is to the Great Lakes or connecting waters per footnote {FF}

- If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

[E] - Criterion is the aesthetic drinking water value per footnote {E}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

BOLD value indicates an exceedance of one or more of the listed criteria.

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Groundwater Sampling Results (Analytical)
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Chronic-Based Mixing Zone GSI Criteria^	Acute-Based Mixing Zone GSI Criteria^	Sample Location: **JCW-MW-18001** Sample Date: 5/7/2024 Downgradient	**JCW-MW-18004** 5/8/2024 Downgradient/ GSI	**JCW-MW-18005** 5/8/2024 Downgradient	**JCW-MW-18006** 5/8/2024 Downgradient	**MW-50** 5/7/2024 Downgradient/ GSI	**MW-51** 5/7/2024 Downgradient/ GSI
Appendix III[(1)]													
Boron	ug/L	NC	**500**	**500**	**4,000**	44,000	69,000	**1,330**	206	**960**	**2,740**	**2,070**	**798**
Calcium	mg/L	NC	NC	NC	**500[EE]**	NC	NC	**537**	213	302	148	184	128
Chloride	mg/L	250**	250[E]	250[E]	**50**	NC	NC	45	14	22	49	37	**80**
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	**500[EE]**	NC	NC	**1,790**	**484**	**475**	122	**425**	**262**
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	NC	NC	**3,370**	**1,130**	**1,390**	**864**	**1,250**	**958**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5[E]	6.5 - 8.5[E]	6.5 - 9.0	NC	NC	6.8	6.9	6.8	7.1	7.5	7.4
Appendix IV[(1)]													
Antimony	ug/L	6	6.0	6.0	2.0	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	100	680	2	< 1	4	**29**	3	**13**
Barium	ug/L	2,000	2,000	2,000	1,200	NC	NC	46	26	127	390	176	117
Beryllium	ug/L	4	4.0	4.0	33	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	NC	NC	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	NC	NC	102	43	41	59	61	28
Mercury	ug/L	2	2.0	2.0	0.20#	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	NC	NC	< 5	< 5	< 5	< 5	5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	NC	NC	0.124	0.102	0.165	0.218	0.270	0.181
Radium-228	pCi/L	NC	NC	NC	NC	NC	NC	0.525	0.672	1.230	0.919	1.470	0.863
Radium-226/228	pCi/L	5	NC	NC	NC	NC	NC	0.506	0.672	1.070	0.919	1.200	0.681
Selenium	ug/L	50	50	50	5.0	55	120	2	4	< 1	< 1	1	< 1
Thallium	ug/L	2	2.0	2.0	2.0	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]													
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	NC	NC	**2,630**	73	**6,550**	**10,400**	**834**	**760**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	NC	NC	4	2	2	1	2	1
Nickel	ug/L	NC	100	100	120	NC	NC	4	< 2	< 2	6	< 2	3
Silver	ug/L	100**	34	98	0.2	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	NC	NC	2	< 2	< 2	3	< 2	2
Zinc	ug/L	5,000**	2,400	5,000[E]	260	NC	NC	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.
pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.
MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.
NC - no criteria; -- - not analyzed.
* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.
** - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.
^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. Chromium GSI criterion based on hexavalent chromium per footnote {H}. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}. GSI criterion for chloride is 50 mg/L when the discharge is to the Great Lakes or connecting waters per footnote {FF}
# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.
[E] - Criterion is the aesthetic drinking water value per footnote {E}.
[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.
(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.
BOLD value indicates an exceedance of one or more of the listed criteria.
RED value indicates an exceedance of the MCL.
All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Groundwater Sampling Results (Analytical)
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

							Sample Location:	**MW-52**	**MW-53**	**MW-53R**	**MW-54R**	**MW-55**	**OW-57ROUT**
							Sample Date:	5/7/2024	5/7/2024	5/7/2024	5/7/2024	5/8/2024	5/8/2024
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Chronic-Based Mixing Zone GSI Criteria^	Acute-Based Mixing Zone GSI Criteria^	Downgradient/ GSI	Downgradient/ GSI	Downgradient/ GSI	Downgradient/ GSI	Downgradient/ GSI	Downgradient
Appendix III[(1)]													
Boron	ug/L	NC	**500**	**500**	**4,000**	44,000	69,000	**895**	**6,110**	**2,200**	**5,580**	**729**	**1,700**
Calcium	mg/L	NC	NC	NC	**500[EE]**	NC	NC	236	134	166	161	161	119
Chloride	mg/L	250**	250[E]	250[E]	**50**	NC	NC	33	**89**	33	**57**	17	**72**
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,090
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	**500[EE]**	NC	NC	**550**	2	48	51	236	78
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	NC	NC	**1,430**	**942**	**880**	**792**	**934**	**790**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5[E]	6.5 - 8.5[E]	6.5 - 9.0	NC	NC	7.0	7.5	7.1	7.2	6.9	7.2
Appendix IV[(1)]													
Antimony	ug/L	6	6.0	6.0	2.0	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	100	680	< 1	1	10	1	**39**	1
Barium	ug/L	2,000	2,000	2,000	1,200	NC	NC	91	582	164	83	235	75
Beryllium	ug/L	4	4.0	4.0	33	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	NC	NC	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,090
Lead	ug/L	NC	4.0	4.0	14	NC	NC	< 1	< 1	1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	NC	NC	29	50	53	73	26	26
Mercury	ug/L	2	2.0	2.0	0.20#	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	NC	NC	< 5	< 5	< 5	18	25	6
Radium-226	pCi/L	NC	NC	NC	NC	NC	NC	0.162	0.561	0.155	0.180	0.137	0.115
Radium-228	pCi/L	NC	NC	NC	NC	NC	NC	1.190	1.810	0.674	0.829	1.110	0.845
Radium-226/228	pCi/L	5	NC	NC	NC	NC	NC	1.030	1.250	0.567	0.829	0.971	0.731
Selenium	ug/L	50	50	50	5.0	55	120	1	2	1	2	4	1
Thallium	ug/L	2	2.0	2.0	2.0	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]													
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	NC	NC	**3,680**	**665**	**761**	87	**14,700**	94
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	NC	NC	2	2	1	3	1	2
Nickel	ug/L	NC	100	100	120	NC	NC	< 2	< 2	< 2	< 2	6	15
Silver	ug/L	100**	34	98	0.2	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	5,000**	2,400	5,000[E]	260	NC	NC	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.
pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.
MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.
NC - no criteria; -- - not analyzed.
* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.
** - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.
^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. Chromium GSI criterion based on hexavalent chromium per footnote {H}. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}. GSI criterion for chloride is 50 mg/L when the discharge is to the Great Lakes or connecting waters per footnote {FF}
# - If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.
[E] - Criterion is the aesthetic drinking water value per footnote {E}.
[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.
(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.
BOLD value indicates an exceedance of one or more of the listed criteria.
RED value indicates an exceedance of the MCL.
All metals were analyzed as total unless otherwise specified.

Table 5
Summary of Confidence Interval Evaluation: Second Quarter 2024
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Assessment Monitoring Statistical Evaluation

Constituent	Units	GWPS	MW-50		MW-51		MW-52		MW-53		MW-53R		MW-54R		MW-55		OW-57R OUT		JCW-MW-18001		JCW-MW-18005		JCW-MW-18006	
			LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL
Boron[1]	ug/L	560	**1,500**	2,100	540	1,200	**910**	1,200	**2,900**	5,900	**2,000**	2,400	**5,100**	6,000	**760**	1,200	**1,700**	1,900	**1,300**	1,600	**930**	1,500	**2,000**	2,800
Calcium	mg/L	280	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**440**	570	150	300	--	--
Sulfate	mg/L	780	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1,700**	2,300	--	--	--	--
Arsenic	ug/L	21	--	--	--	--	--	--	--	--	--	--	--	--	--[2]	--[2]	--	--	--	--	--	--	13	28
Molybdenum	ug/L	73	--	--	--	--	--	--	--	--	--	--	--	--	--[2]	--[2]	--	--	--	--	--	--	--	--

GSI Monitoring Statistical Evaluation

Constituent	Units	GSI	MW-55	
			LCL	UCL
Arsenic	ug/L	100	39	99

Notes:

ug/L - micrograms per Liter

mg/L - milligrams per Liter

-- - Not Applicable; well/parameter pair did not directly exceed the applicable criterion and was not included in further analysis.

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated April 23, 2021

GSI - Groundwater Surface Water Interface Criteria; GSI criteria is the generic Michigan Part 201 GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

UCL - Upper Confidence Limit (α = 0.01) of the downgradient data set.

LCL - Lower Confidence Limit (α = 0.01) of the downgradient data set.

1,300	Indicates a statistically significant exceedance of the GWPS (detection monitoring constituent). An exceedance occurs when the LCL is greater than the criterion.
1,300	Indicates a statistically significant exceedance of the GWPS (assessment monitoring constituent). An exceedance occurs when the LCL is greater than the criterion.
1,300	Indicates a statistically significant exceedance of the applicable GSI criterion. An exceedance occurs when the LCL is greater than the criterion.

(1) Boron concentrations were confirmed as a statistically significant increase (SSI) over background levels and triggered assessment monitoring (2017 Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit, TRC, 2018).

(2) The concentrations of arsenic and molybdenum at MW-55 are not a result of a release from the unit, as detailed in the Alternate Source Demonstration (2021 Annual Groundwater Monitoring and Corrective Action Report, TRC, January 2022); therefore, confidence intervals were not calculated for comparison to GWPSs.,

Table 6
EGLE Exceedance Summary Table
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
SUMMARY OF STATISTICAL EXCEEDANCES

Data is in	**(X) ug/L**	**or**
	( ) mg/L	
unless otherwise stated		

Facility: JC Weadock – WDS# 395457

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	2 Qtr. 2024 (**bold** >201)	1 Qtr. 2024 (**bold** >201)	4 Qtr. 2023 (**bold** >201)	3 Qtr. 2023 (**bold** >201)

No Exceedances at Compliance Locations

Figures

N

0 1,500 3,000

FEET

1:36,000 1" = 3,000'

BASE MAP: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

PROJECT: CONSUMERS ENERGY COMPANY DE KARN AND JC WEADOCK POWER PLANTS ESSEXVILLE, MICHIGAN			
TITLE: SITE LOCATION MAP			
DRAWN BY:	A. ADAIR	PROJ. NO.:	553828.0000
CHECKED BY:	J. KRENZ	FIGURE 1	
APPROVED BY:	D. LITZ		
DATE:	JULY 2024		
TRC		1540 EISENHOWER PLACE ANN ARBOR, MI 48108-3284 PHONE: 734.971.7080	
FILE:			464096_WEADOCK

LEGEND

- BACKGROUND MONITORING WELL
- JCW BOTTOM ASH POND MONITORING WELL
- JCW LANDFILL HMP WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- LEACHATE HEADWELL
- DECOMMISSIONED WELL
- SLURRY WALL (APPROXIMATE)

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. MONITORING WELL AND SLURRY WALL LOCATIONS PROVIDED BY CEC; SG21733SHT2 REVB.DWG DATED 11/21/2018.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).

1:7,200
1" = 600'
0 600 1,200 FEET

PROJECT: CONSUMERS ENERGY COMPANY
JC WEADOCK POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE: SITE MAP

DRAWN BY:	A. ADAIR	PROJ. NO.:	553828.0000
CHECKED BY:	J. KRENZ		FIGURE 2
APPROVED BY:	D. LITZ		
DATE:	JULY 2024		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: 464096 Weadock aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0
Saved By: AADAIR on 8/6/2024 11:35:03 AM | File Path: T:\PROJECTS\Consumers_Energy\464096_Weadock\3.0_ARPX\464096_Weadock.aprx | Layout Name: 553828.2024-002

Lake Huron
Saginaw Bay
(579.61)NOTE 3

DE KARN
GENERATING FACILITY

FORMER BOTTOM
ASH POND

FORMER
JC WEADOCK
GENERATING FACILITY

DISCHARGE CHANNEL

SLURRY WALL

LANDFILL

TACEY DRAIN

UNDERWOOD DRAIN

Saginaw River

MW-50 (579.71)
MW-51 (579.84)
MW-52 (579.80)
JCW-OW-18002 (583.23)
OW-51 (584.52)
JCW-OW-18003 (587.75)
JCW-MW-15010 (580.38)
JCW-MW-18001 (579.65)
JCW-OW-18001 (589.28)
OW-53 (586.24)
MW-53 (579.83)
JCW-MW-15009 (580.79)
OW-61 (595.75)
JCW-MW-15007 (584.15)
JCW-MW-15028 (582.34)
LH-103R (592.01)
MW-53R (579.75)
JCW-MW-18006 (588.32)
JCW-OW-18006 (594.08)
MW-54R (579.97)
OW-54 (586.91)
OW-57RIN (585.60)
CW-57IN (585.58)
OW-57ROUT (582.79)
OW-57OUT (582.39)
JCW-OW-18004 (587.97)
JCW-MW-18004 (580.66)
MW-15008 (581.11)
OW-56R (586.33)
OW-55 (588.41)
LH-104 (588.56)
MW-58 (581.01)
MW-20 (586.38)
JCW-MW-18005 (582.39)
MW-55 (579.72)
MW-15019 (580.94)
MW-15002 (581.06)
MW-15016 (583.04)

580·0 582·0 584·0 586·0 588·0 590·0 592·0 594·0

LEGEND

- BACKGROUND MONITORING WELL
- JCW BOTTOM ASH POND MONITORING WELL
- JCW LANDFILL HMP WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- LEACHATE HEADWELL
- DECOMMISSIONED WELL
- SLURRY WALL (APPROXIMATE)
- GROUNDWATER ELEVATION CONTOUR (2' INTERVAL, DASHED WHERE INFERRED)
- (590.51) GROUNDWATER ELEVATION (FEET)
- (NU) NOT USED TO DEVELOP CONTOURS

NOTES
1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. MONITORING WELL AND SLURRY WALL LOCATIONS PROVIDED BY CEC, SG21733SHT2 REVB.DWG DATED 11/21/2018.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

N

1:7,200
1" = 600'
0 600 1,200 FEET

PROJECT: CONSUMERS ENERGY COMPANY
JC WEADOCK POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE: POTENTIOMETRIC SURFACE MAP
MAY 2024

DRAWN BY:	A. ADAIR	PROJ. NO:	553828.0000
CHECKED BY:	J. KRENZ		FIGURE 3
APPROVED BY:	D. LITZ		
DATE:	JULY 2024		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: 484096 Weadock.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0
Saved By: ADAIR on 6/7/2024 - 12:56:48 PM - File Path: T:\1900_ACCTS\Consumers_Energy\484096_Weadock\2-ARP\MXD\484096_Weadock.aprx - Layout Name: 553828.2024.003

Appendix A
Static Water Level Evaluation

Table A1
Static Water Levels for Select Perimeter Dike Monitoring Wells and NOAA Staff Gauge
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Well Location	Date Measured	Groundwater Water Elevation (GWE) (ft)	Saginaw Bay Surface Water Elevation (SWE) (ft)	Elevation Difference (GWE-SWE)[(1)]
MW-50	5/6/2024	579.71	579.61	0.10
MW-51	5/6/2024	579.84		0.23
MW-52	5/6/2024	579.80		0.19
MW-53	5/6/2024	579.83		0.22
MW-53R	5/6/2024	579.75		0.14
MW-54R	5/6/2024	579.97		0.36
MW-55	5/6/2024	579.72		0.11
JCW-MW-18004	5/6/2024	580.66		1.05
Average:		**579.91**		

Notes:

Elevation in feet above North American Vertical Datum 1988 (NAVD 88)

TOC: top of well casing

ft BTOC: feet below top of well casing

(1) Positive elevation difference indicates flow toward the surface water body.

Table A2
Slurry Wall Gradient and Flux
JC Weadock Solid Waste Disposal Area – Hydrogeological Monitoring Program
Essexville, Michigan

Monitoring Well Pair Discharge Channel	SWL Obs Well (ft NAVD 88)	SWL MW (ft NAVD 88)	x_{wells} (ft)	i (ft/ft)	Saturated Thickness (ft)	Mean Thickness (ft)	Section Length (ft)	K (cm/sec)	i (ft/ft)	Area (ft^2)	Flow ft^3/day	Flow Gal/day	Flow Gal/yr
JCW-OW-18001	589.28		22.4	4.30E-01	2.00	2.88	1,010	2.30E-08	0.43	2,904	8.15E-02	0.61	223
JCW-MW-18001		579.65			3.75								
JCW-OW-18002	583.23		28.9	1.22E-01	4.00	4.25	970		0.12	4,123	3.28E-02	0.25	89
MW-50		579.71			4.50								

Monitoring Well Pair Adjacent Zone	SWL Obs Well (ft NAVD 88)	SWL MW (ft NAVD 88)	x_{wells} (ft)	i (ft/ft)	Saturated Thickness (ft)	Mean Thickness (ft)	Section Length (ft)	K (cm/sec)	i (ft/ft)	Area (ft^2)	Flow ft^3/day	Flow Gal/day	Flow Gal/yr
OW-51	584.52		14.4	3.25E-01	4.00	4.27	1,850	2.30E-08	0.33	7,900	1.68E-01	1.25	458
MW-51		579.84			4.54								
JCW-OW-18003	587.75		33.9	2.35E-01	3.50	3.76	740		0.23	2,779	4.25E-02	0.32	116
MW-52		579.80			4.01								
OW-53	586.24		20.1	3.18E-01	1.25	1.62	730		0.32	1,183	2.45E-02	0.18	67
MW-53		579.83			1.99								

Monitoring Well Pair Non-Adjacent Zone	SWL Obs Well (ft NAVD 88)	SWL MW (ft NAVD 88)	x_{wells} (ft)	i (ft/ft)	Saturated Thickness (ft)	Mean Thickness (ft)	Section Length (ft)	K (cm/sec)	i (ft/ft)	Area (ft^2)	Flow ft^3/day	Flow Gal/day	Flow Gal/yr
OW-54	586.91		21.2	3.27E-01	2.00	2.25	510	2.30E-08	0.33	1,148	2.45E-02	0.18	67
MW-54R		579.97			2.50								
JCW-OW-18004	587.97		26.6	2.75E-01	8.00	4.38	820		0.27	3,592	6.44E-02	0.48	176
JCW-MW-18004		580.66			0.76								
OW-55	588.41		24	3.63E-01	2.00	1.86	1,220		0.36	2,269	5.37E-02	0.40	147
MW-55		579.72			1.72								
MW-20	586.38		40.9	9.75E-02	1.50	1.38	1,120		0.10	1,540	9.79E-03	0.07	27
JCW-MW-18005		582.39			1.25								

Calculated Groundwater Discharge from JC Weadock (gal per day)	**=**	**3.75**
(cubic ft per day)	**=**	**0.50**
(cubic ft per min)		**3.5E-04**
Calculated Groundwater Discharge from JC Weadock (gal per yr)	**=**	**1,369**
(cubic ft per yr)	**=**	**183**
Calculated Groundwater Discharge from JC Weadock (gal per year per linear foot of dike)	**=**	**0.15**
(cubic feet per year per linear foot of dike)	**=**	**2.04E-02**

Notes:

Water level data collected on May 6, 2024 are shown by yellow cells: **579.58**

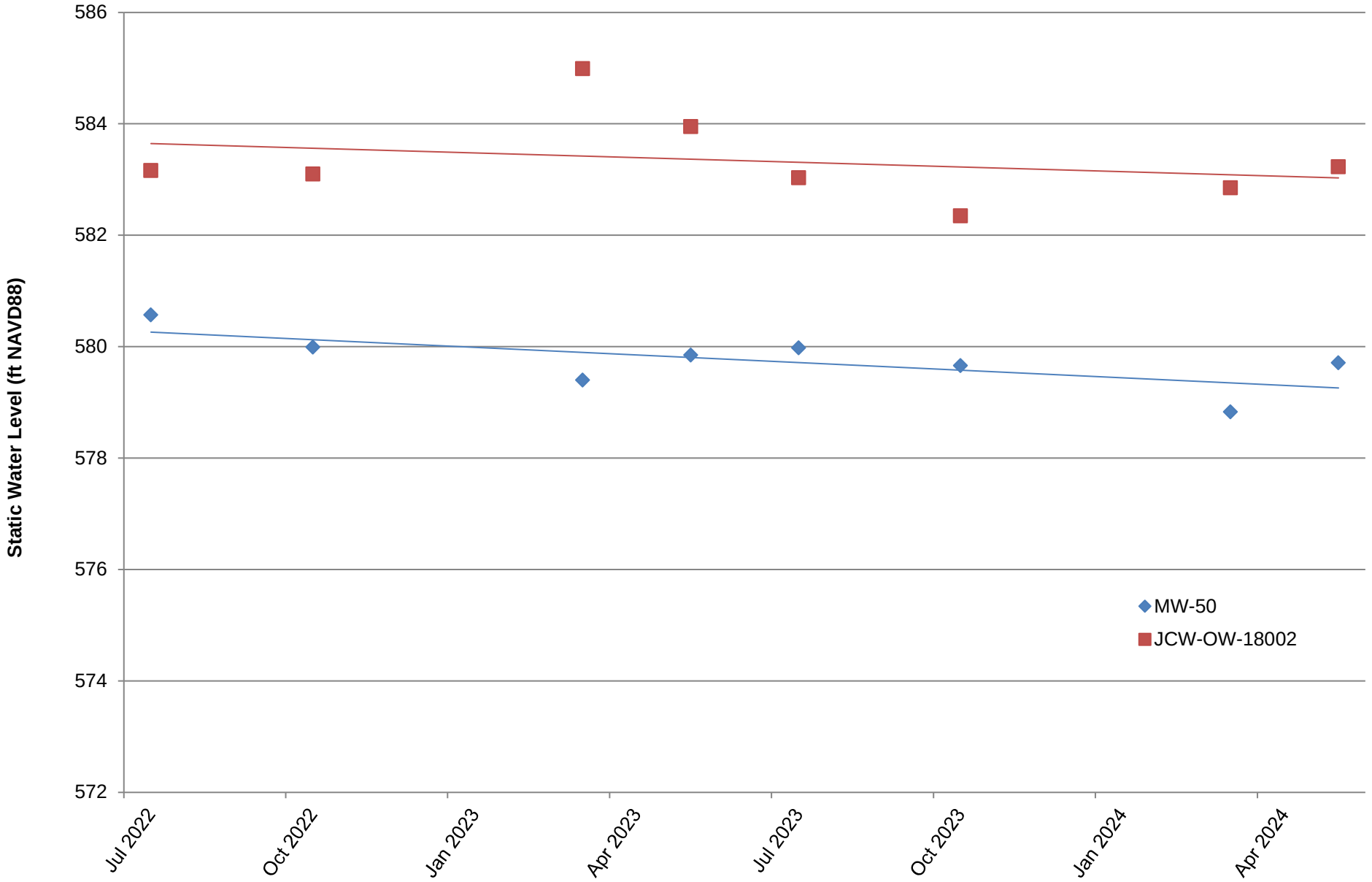
1. Monitoring Well Zones based on Phase II Evaluation, Appendix K Groundwater Discharge Calculations, September 30, 2005. Representative wells based on the Landfill Hydrogeological Monitoring Plan, February 2021.
2. Saturated thickness will be the thickness of the sand unit when the observed SWL is above the top of the sand unit, or the measured saturated thickness of the sand unit if the SWL is below the top of the sand unit.
3. Hydraulic conductivity taken as harmonic mean of laboratory tests done on in-place slurry wall from NTH Certified Quality Assurance Report, Appendix E, April 24, 2009
4. Arithmetic average used to develop geometric properties of each section/zone (e.g. discharge channel, adjacent, and non-adjacent)
5. If Obs well SWL < MW SWL calculated flow will be zero.

SWL = Static Water Level; Obs Well = Observation Well; MW= Monitoring Well; ft NAVD 88 = feet above North American Vertical Datum 1988

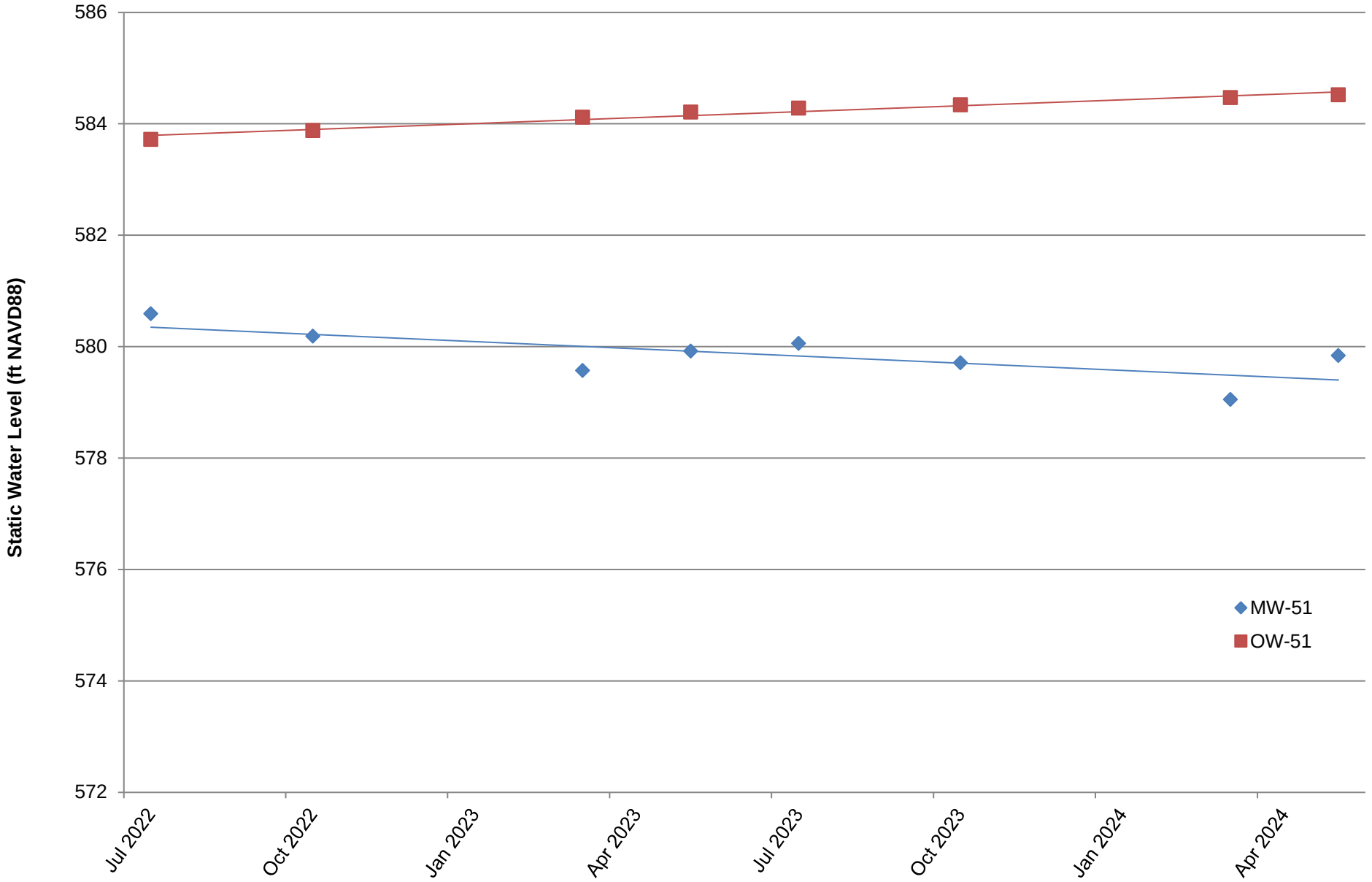
ft/ft = feet per foot; cm/sec = centimeters per second; ft^2 = square feet; ft^3/day = cubic feet per day; Gal/day = gallons per day; Gal/yr = gallons per year

i = hydraulic gradient; K = hydraulic conductivity; x_{wells} = distance between well pairs

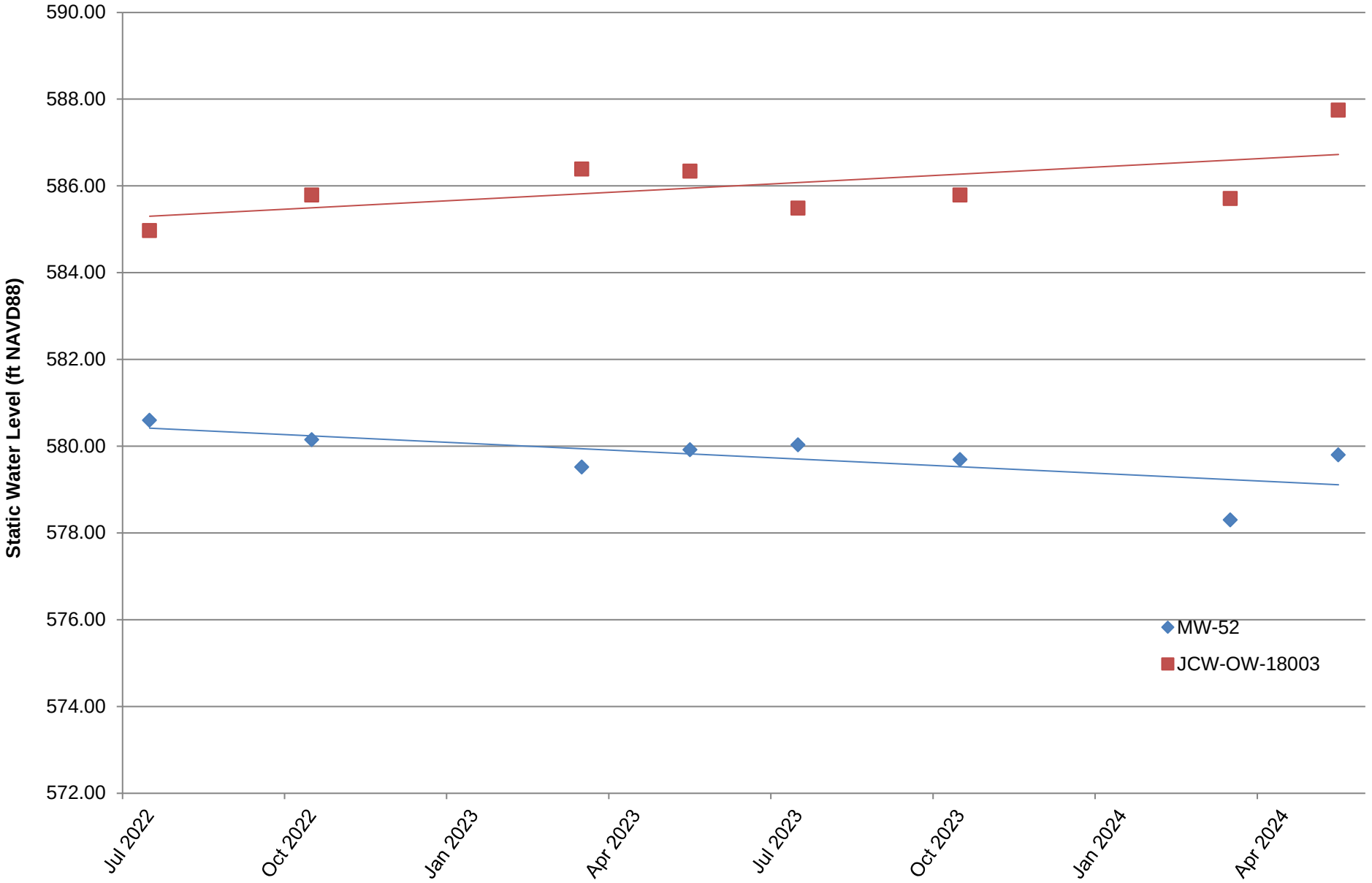
Appendix A
Static Water Level for MW-50 and JCW-OW-18002



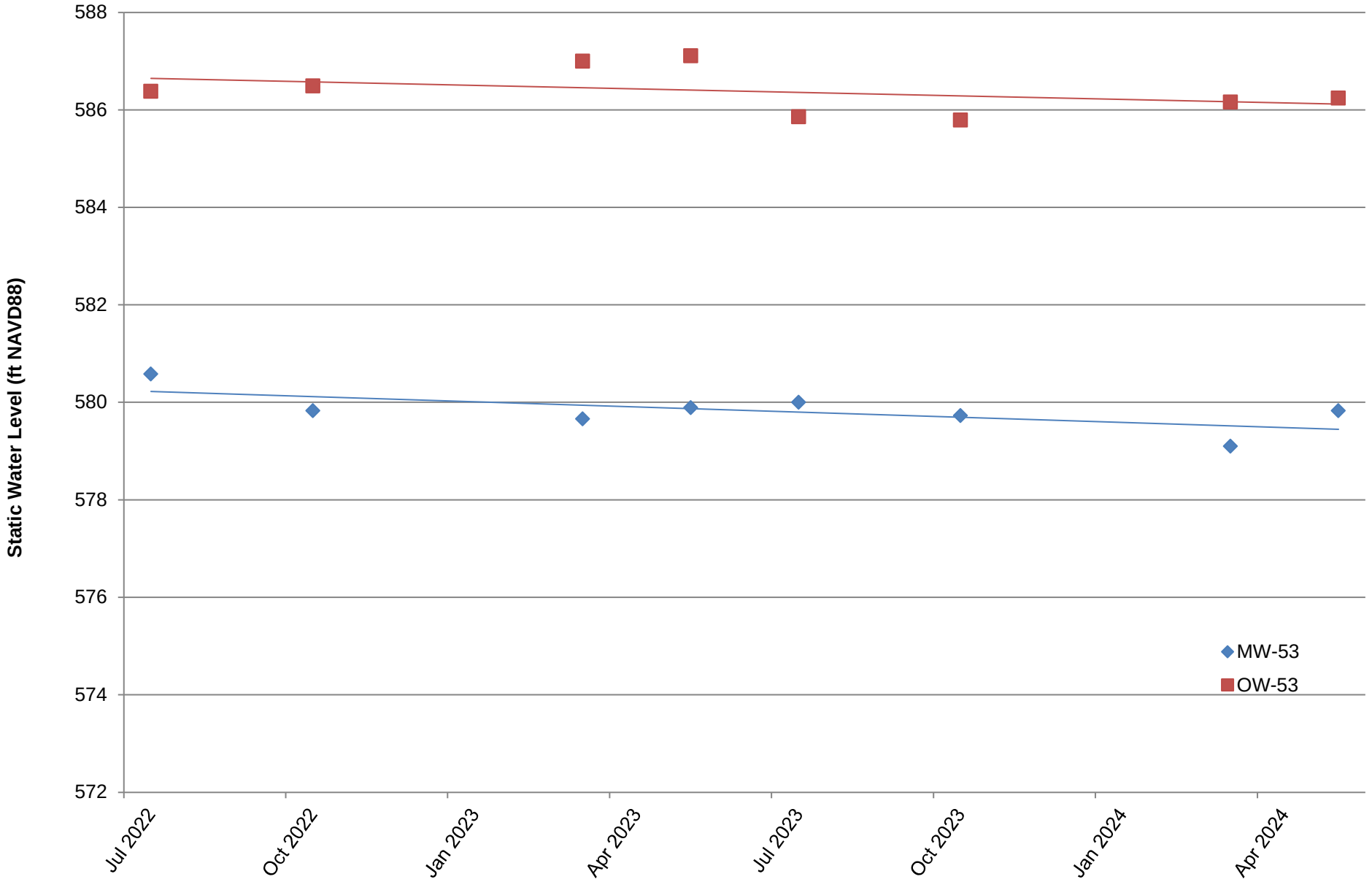
Appendix A
Static Water Level for MW-51 and OW-51



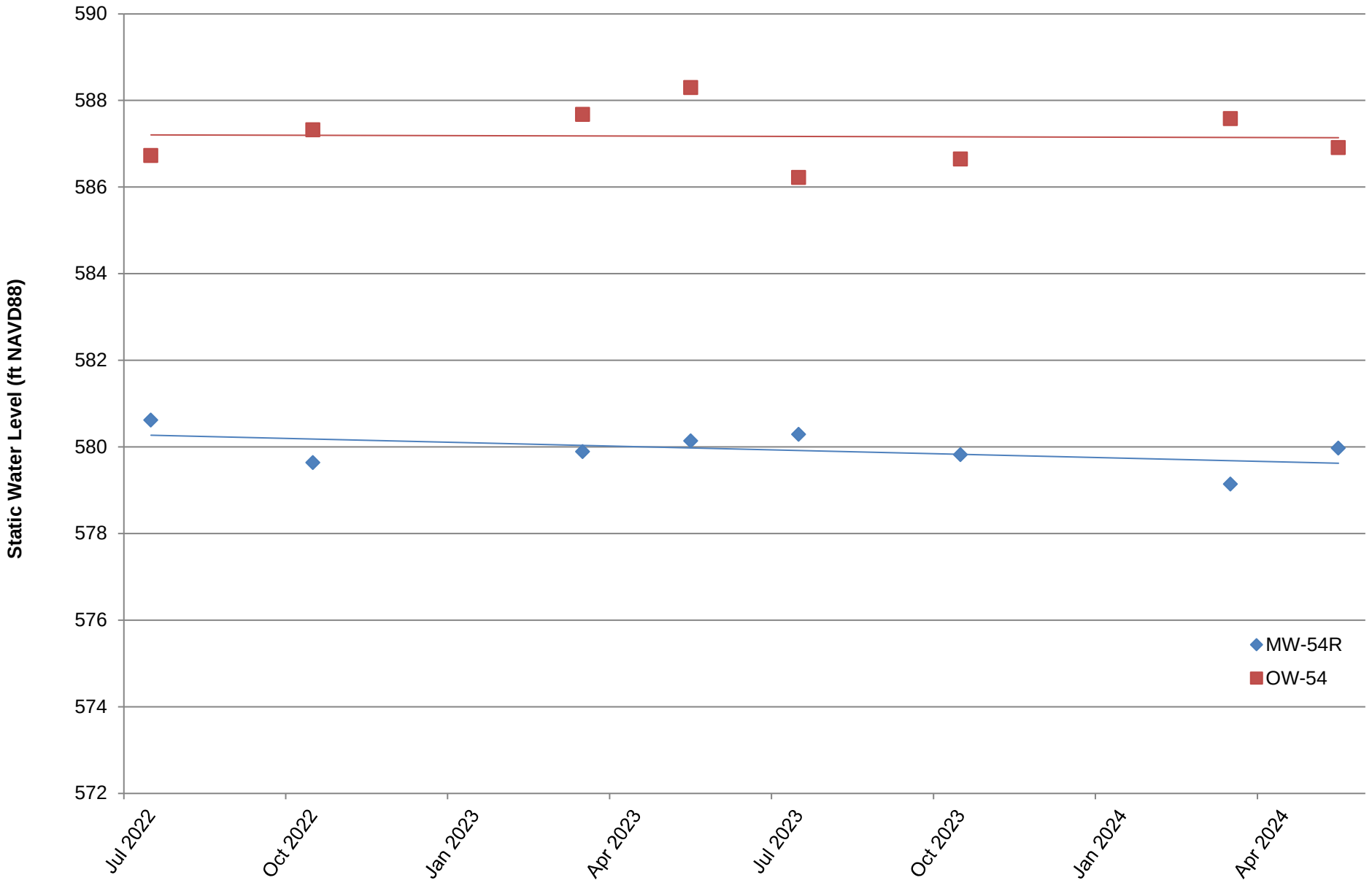
Appendix A
Static Water Level for MW-52 and JCW-OW-18003



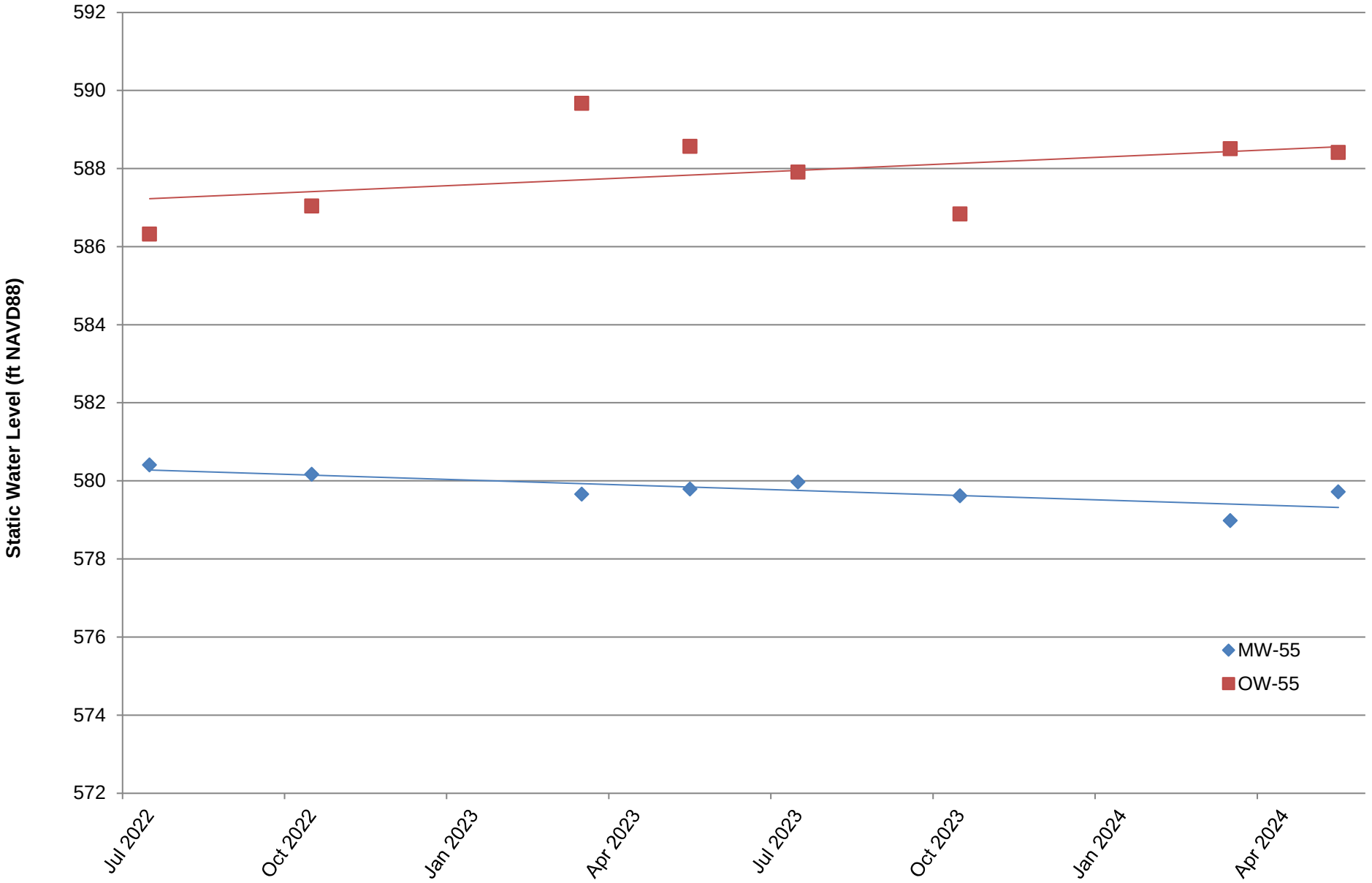
Appendix A
Static Water Level for MW-53 and OW-53



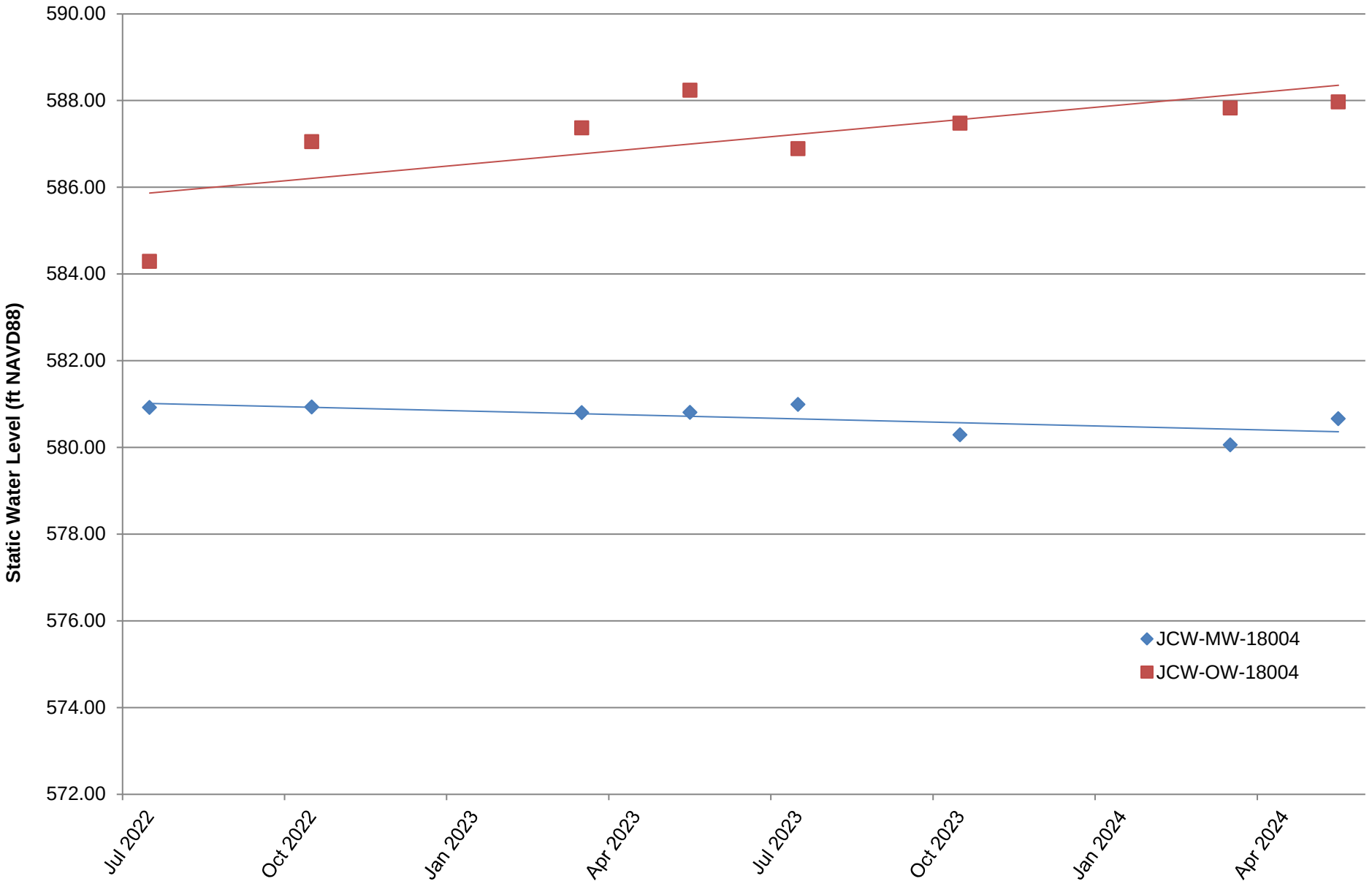
Appendix A
Static Water Level for MW-54R and OW-54



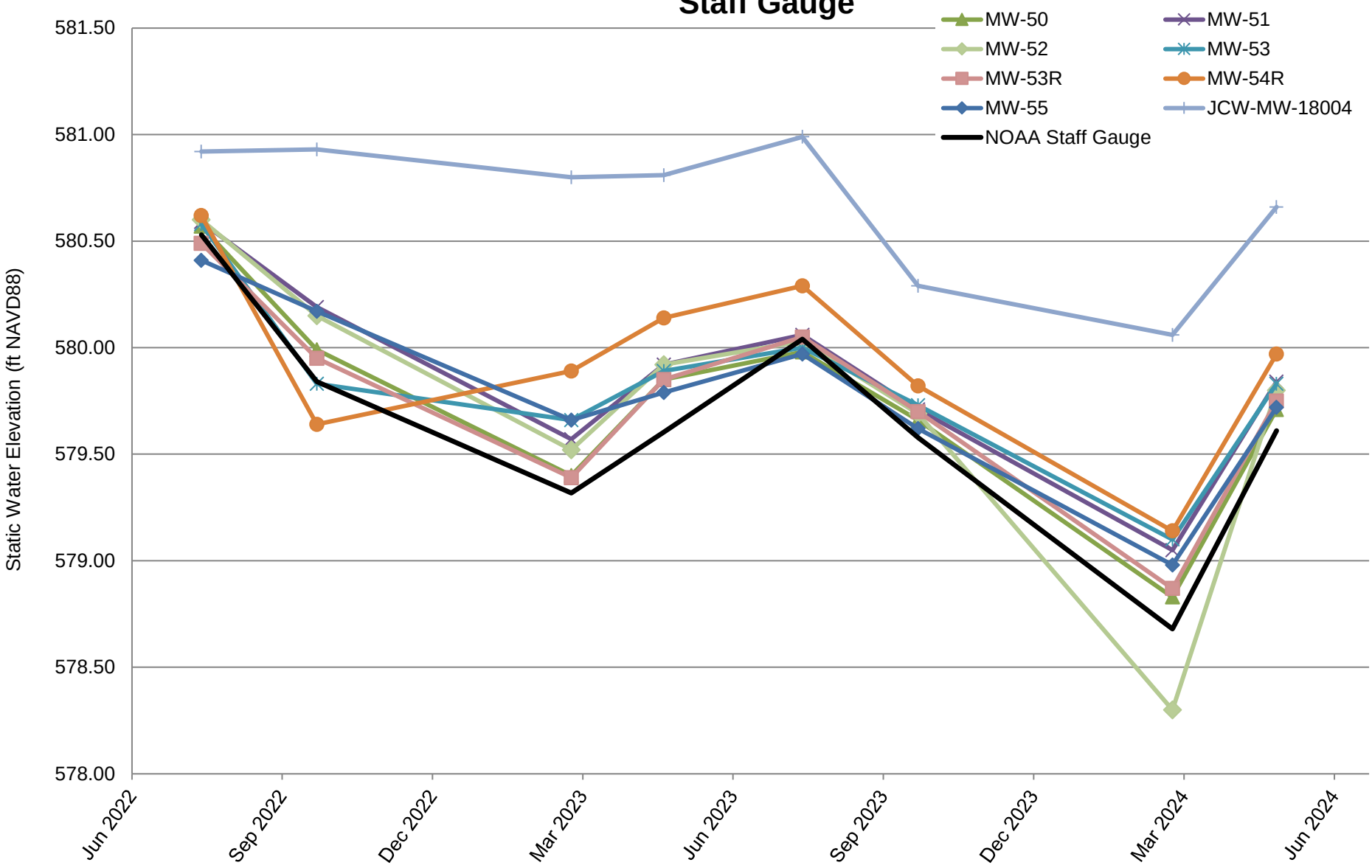
Appendix A
Static Water Level for MW-55 and OW-55



Appendix A
Static Water Level for JCW-MW-18004 and JCW-OW-18004



Appendix A
Static Water Elevations for Select Perimeter Dike Monitoring Wells and NOAA Staff Gauge



Appendix B
Data Quality Review

Laboratory Data Quality Review
Groundwater Monitoring Event April 2024
JC Weadock/DE Karn Background

Groundwater samples were collected by TRC for the April 2024 sampling event. Samples were analyzed for total metals, anions, and total dissolved solids by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0343.

During the April 2024 sampling event, a groundwater sample was collected from each of the following wells:

- MW-15002
- MW-15008
- MW-15016
- MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative;
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and laboratory control samples were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the metals, anions, and TDS analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III, IV, and additional Part 115 constituents, as well as magnesium, potassium, and sodium, will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One field blank (FB-Background) was collected. Target analytes were not detected above the RL in this blank sample.
- Samples DUP-Background/MW-15008 were submitted as the field duplicate pair with this data set; all criteria were met.
- Laboratory duplicate and MS/MSD analyses were not performed on a sample from this data set.

Laboratory Data Quality Review
Groundwater Monitoring Event May 2024
JC Weadock/Karn DEK Background

Groundwater samples were collected by TRC for the May 2024 sampling event. Samples were analyzed for radium by Eurofins in St. Louis, Missouri. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-204358-1.

During the May 2024 sampling event, a groundwater sample was collected from each of the following wells:

- MW-15002
- MW-15008
- MW-15016
- MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;

- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- Target analytes were not detected in the method blanks.
- One equipment blank (EQ-BACKGROUND) was collected. Target analytes were not detected in the equipment blank sample.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this data set.
- Samples DUP-BACKGROUND/MW-15008 were submitted as the field duplicate pair with this data set; all criteria were met.
- Carrier recoveries were within 40-110%.

Laboratory Data Quality Review
Groundwater Monitoring Event April 2024
JC Weadock Landfill

Porewater samples were collected by TRC for the April 2024 sampling event. Samples were analyzed for total metals, anions, total dissolved solids, and/or alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 24-0344R.

During the April 2024 sampling event, a porewater sample was collected from each of the following wells:

- JCW-MW-18001
- JCW-MW-18004
- JCW-MW-18005
- JCW-MW-18006
- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- MW-58
- OW-57R OUT

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;

- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the metals, anions, TDS, and alkalinity analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III, IV, optional Piper Diagram analyses, and additional Part 115 constituents will be utilized for the purposes of the assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One field blank (FB-01) and one equipment blank (EB-01) were collected. Target analytes were not detected in these blank samples with the following exception.
  - Copper was detected in EB-01 at 3 µg/L. Potential false positive exists for the positive results for copper in all porewater samples in this data set as summarized in attachment A.
- MS and MSD analyses were performed on sample JCW-MW-18001 for total metals and anions. The recoveries were within the acceptance limits. Relative percent differences were not provided by the laboratory and therefore were not evaluated; further, MS/MSD

concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.

- Samples DUP-JCW-LF-02/JCW-MW-18006 and DUP-JCW-LF-01/MW-50 were submitted as the field duplicate pairs with this data set; all criteria between the parent and duplicate samples were within the QC limits.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The RL for sulfate was 1 mg/L and the requested RL was 2 mg/L. Sulfate was detected between the RL and requested RL at 1.530 mg/L in sample MW-53. No adverse impact on data usability since reported RL is lower than requested RL.

Attachment A
Summary of Data Non-Conformances for Groundwater Analytical Data
JCW Landfill
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
JCW-MW-18001	5/7/2024	Copper	Equipment blank contamination; potential false positive.
JCW-MW-18004	5/8/2024		
JCW-MW-18005	5/8/2024		
JCW-MW-18006	5/8/2024		
MW-50	5/7/2024		
MW-51	5/7/2024		
MW-52	5/7/2024		
MW-53	5/7/2024		
MW-53R	5/7/2024		
MW-54R	5/7/2024		
MW-55	5/8/2024		
OW-57ROUT	5/8/2024		
MW-58	5/8/2024		
DUP-JCW-LF-01	5/7/2024		
DUP-JCW-LF-02	5/8/2024		

Laboratory Data Quality Review
Groundwater Monitoring Event May 2024
JC Weadock Landfill

Groundwater samples were collected by TRC for the May 2024 sampling event. Samples were analyzed for radium by Eurofins in St. Louis, Missouri. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 240-204359-1 and 240-204359-2.

During the May 2024 sampling event, a groundwater sample was collected from each of the following wells:

- JCW-MW-18001
- JCW-MW-18004
- JCW-MW-18005
- JCW-MW-18006
- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- MW-58
- OW-57ROUT

Each sample was analyzed for the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;

- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- For sample JCW-MW-18006, the result for radium-226 was reported without a 21-day waiting period to ensure that short-lived alpha-emitting radium isotopes (e.g. Ra-224) decayed out. The positive radium-226 result reflects the total alpha radium and should be considered potentially biased high in this sample, as summarized in the attached table. This sample had activity below the RL (1.0 picocuries per liter) after the 7 day total alpha radium count time and the result is well below the MCL for combined Radium 226/228 (5.0 picocuries per liter); therefore, the data are deemed usable as reported.
- Target analytes were not detected in the method blanks.
- One equipment blank (EB-1) was collected. Target analytes were not detected in the equipment blank sample.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD analyses were not performed on a sample from this data set.
- Laboratory duplicate analyses were performed on samples JCW-MW-18006 and MW-54R for radium-226 and radium-228; all criteria were met
- Samples DUP-01/MW-50 and DUP-02/JCW-MW-18006 were submitted as the field duplicate pairs with this data set; all criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A
Summary of Data Non-Conformances for Groundwater Analytical Data
JCW Landfill
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
JCW-MW-18006	5/8/2024	Radium-226	Result is potentially biased high due to not undergoing 21-day waiting period prior to analysis. The results are well below the applicable screening criteria and are therefore deemed usable as reported.

Appendix C
Detection Monitoring Statistical Trend Tests

Appendix C
Detection Monitoring Statistical Summary for JC Weadock Facility
Second Quarter 2024
Data from August 2022 to May 2024

Porewater Monitoring Points						
PARAMETER	**JCW-MW-18001**	**JCW-MW-18004**	**JCW-MW-18005**	**JCW-MW-18006**	**MW-50**	**MW-51**
Boron[(1)]	O	O	O	O	O	↓
Calcium	↑ ASD	O	O	↑*	O	↓
Chloride	↓*	O	O	↓*	O	↓*
Fluoride	O*	O*	O*	O*	O*	O*
Iron	↑	O	O	O	O	O
pH/Corrosivity[(1)]	O	O	O	↑*	O	O
Sulfate	↑ ASD	O	O	↑	O	↓
Total Dissolved Solids	O	O	O	↑*	O	↓

Notes:

O* = Non-detect (70%)
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (Second Quarter 2024 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2024).

(1) Boron concentrations and pH levels were confirmed as statistically significant increases (SSIs) over background levels and triggered assessment monitoring (2017 Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit, TRC, 2018).

Appendix C
Detection Monitoring Statistical Summary for JC Weadock Facility
Second Quarter 2024
Data from August 2022 to May 2024

Porewater Monitoring Points						
PARAMETER	**MW-52**	**MW-53**	**MW-53R**	**MW-54R**	**MW-55**	**OW-57R OUT**
Boron[(1)]	O	↑*	O	O	O	O
Calcium	O	O	O	O	O	↑*
Chloride	O	O	O	O	O	O
Fluoride	O*	O*	O*	O*	O*	O*
Iron	O	O	O	O	O	O
pH/Corrosivity[(1)]	O	O	↑*	O	O	↑*
Sulfate	↓	↓	O	O	O	O
Total Dissolved Solids	O	O	O	O	O	O

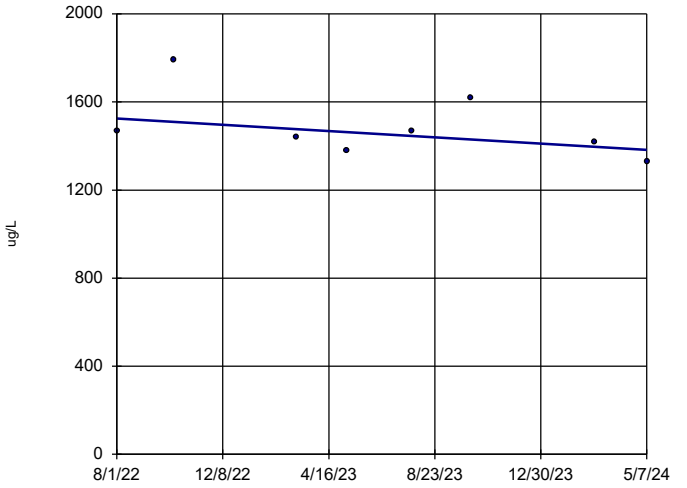
Notes:

O* = Non-detect (70%)
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (Second Quarter 2024 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2024).

(1) Boron concentrations and pH levels were confirmed as statistically significant increases (SSIs) over background levels and triggered assessment monitoring (2017 Annual Groundwater Monitoring Report – JC Weadock Power Plant, Landfill CCR Unit, TRC, 2018).

Boron, Total

JCW-MW-18001



n = 8

Slope = -80.53 units per year.

Mann-Kendall statistic = -11
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

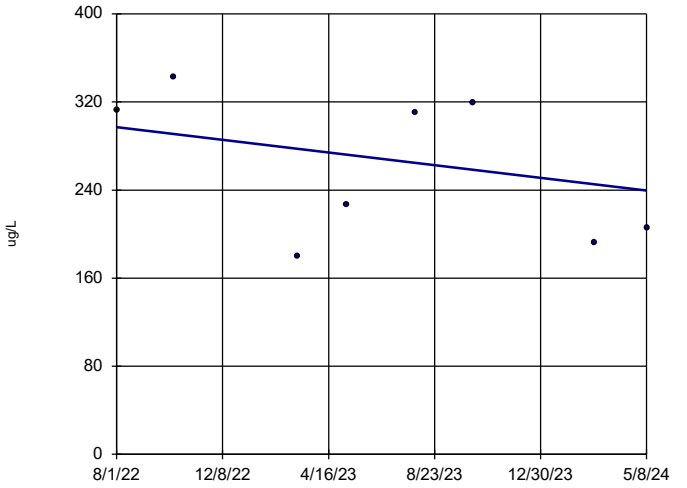
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

JCW-MW-18004



n = 8

Slope = -32.52 units per year.

Mann-Kendall statistic = -6
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

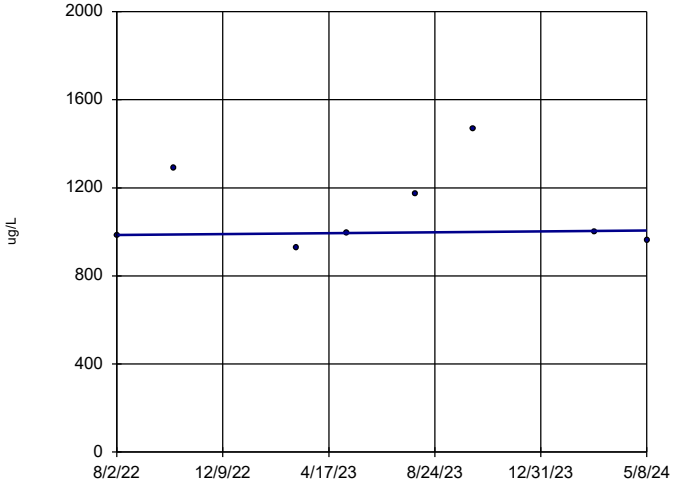
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

JCW-MW-18005



n = 8

Slope = 10.79 units per year.

Mann-Kendall statistic = 2
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

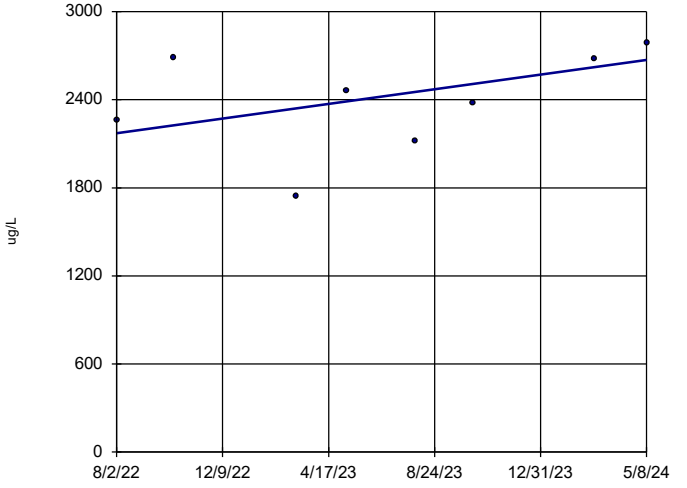
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

JCW-MW-18006



n = 8

Slope = 282.2 units per year.

Mann-Kendall statistic = 10
critical = 17

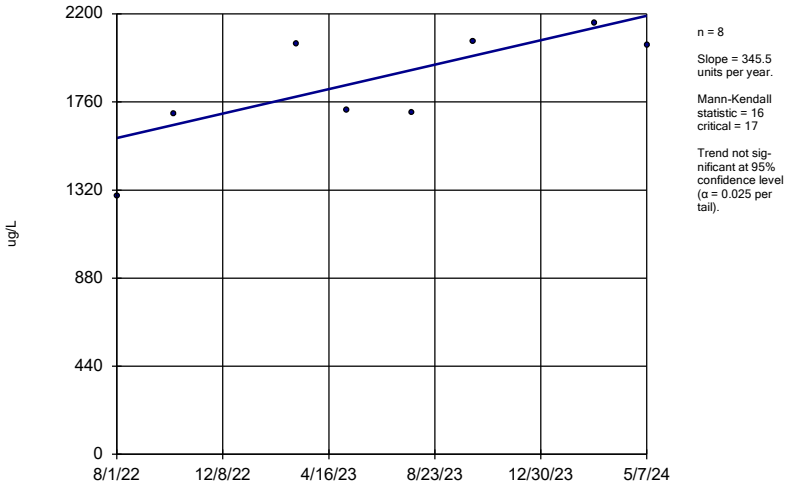
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-50



n = 8

Slope = 345.5 units per year.

Mann-Kendall statistic = 16
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

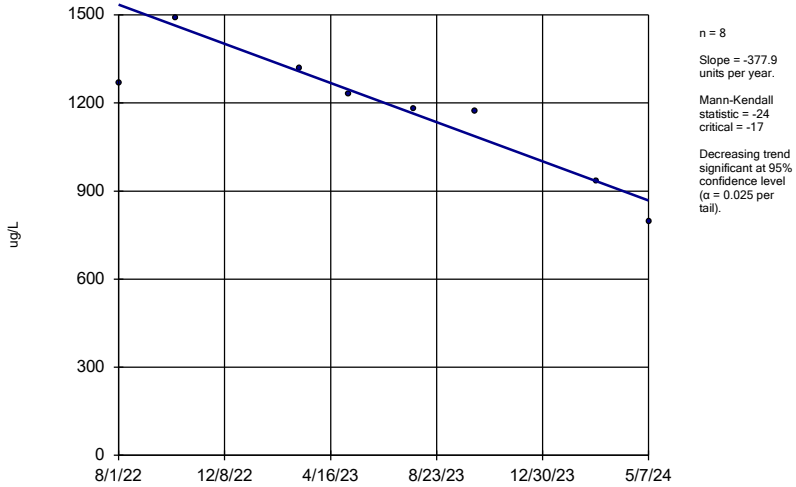
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

MW-51



n = 8

Slope = -377.9 units per year.

Mann-Kendall statistic = -24
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

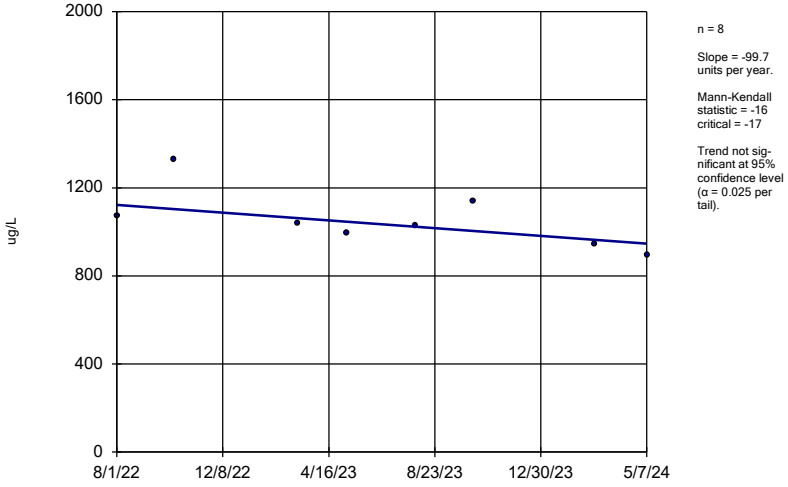
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

MW-52



n = 8

Slope = -99.7 units per year.

Mann-Kendall statistic = -16
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

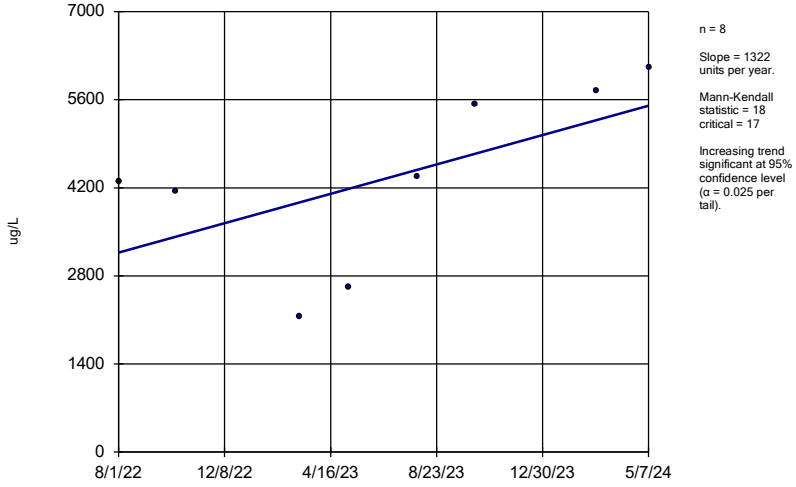
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

MW-53



n = 8

Slope = 1322 units per year.

Mann-Kendall statistic = 18
critical = 17

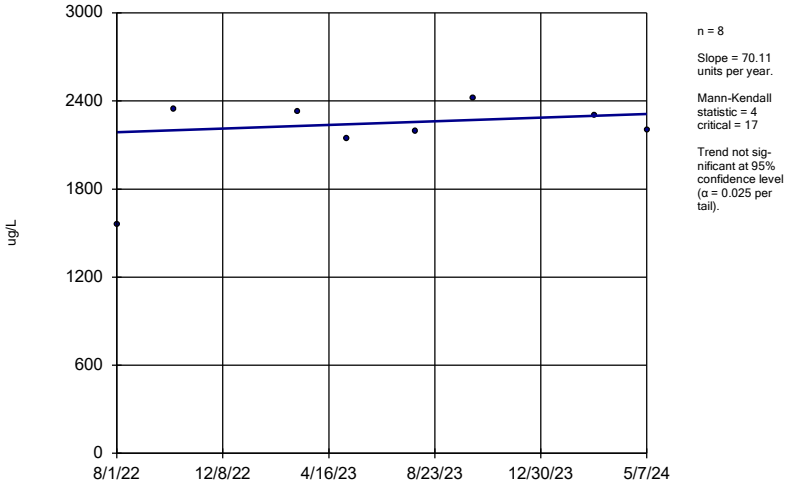
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-53R



n = 8

Slope = 70.11 units per year.

Mann-Kendall statistic = 4 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

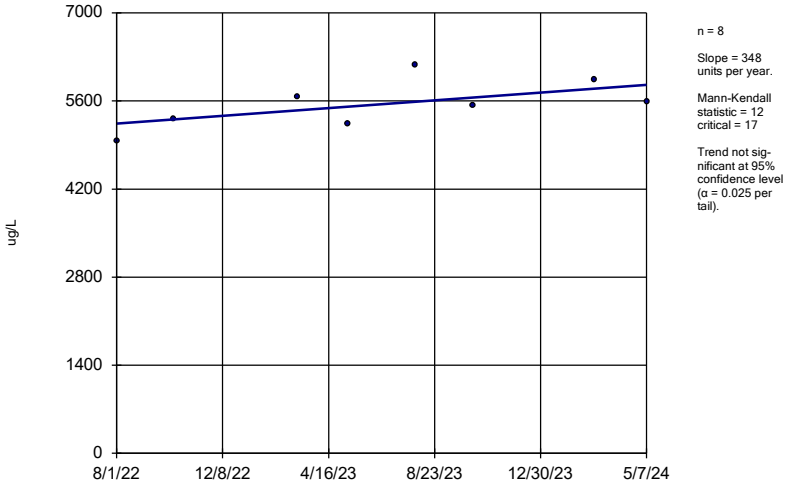
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

MW-54R



n = 8

Slope = 348 units per year.

Mann-Kendall statistic = 12 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

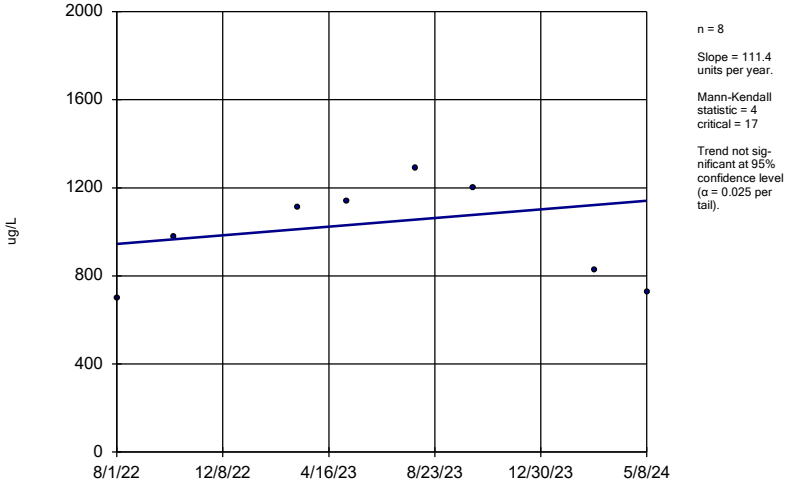
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

MW-55



n = 8

Slope = 111.4 units per year.

Mann-Kendall statistic = 4 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

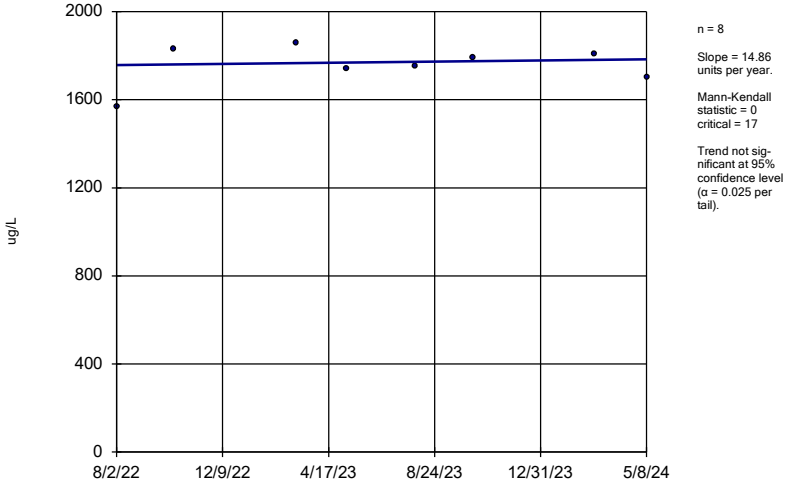
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Boron, Total

OW-57ROUT



n = 8

Slope = 14.86 units per year.

Mann-Kendall statistic = 0 critical = 17

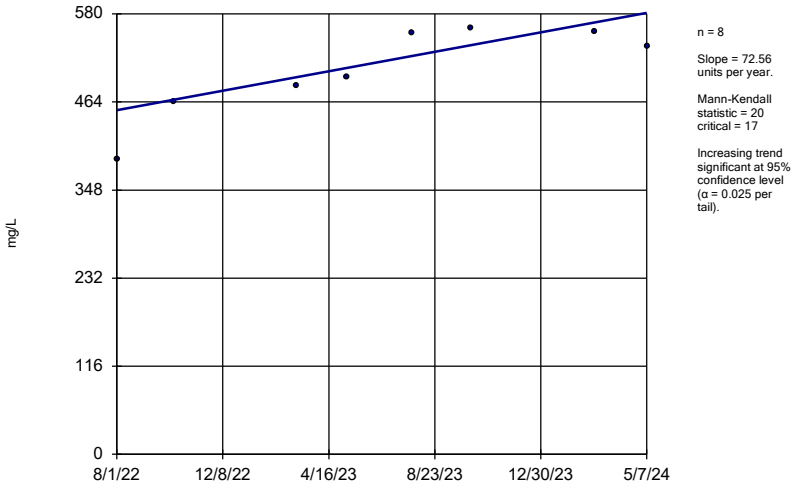
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Calcium, Total

JCW-MW-18001



n = 8

Slope = 72.56 units per year.

Mann-Kendall statistic = 20 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

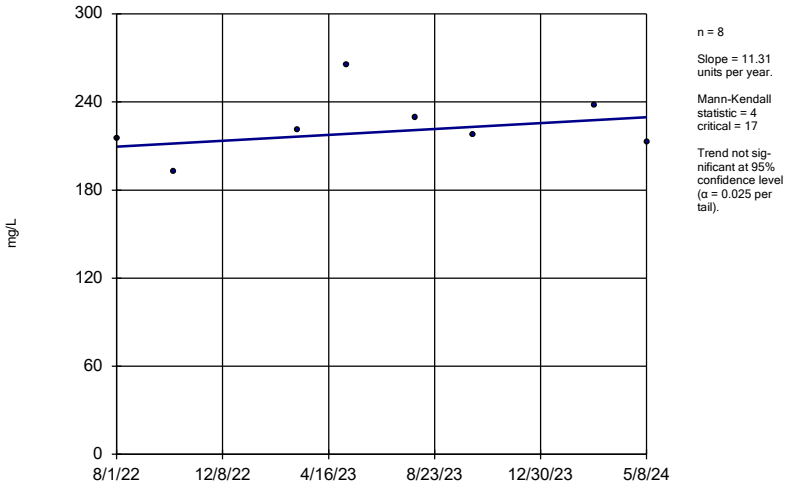
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

JCW-MW-18004



n = 8

Slope = 11.31 units per year.

Mann-Kendall statistic = 4 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

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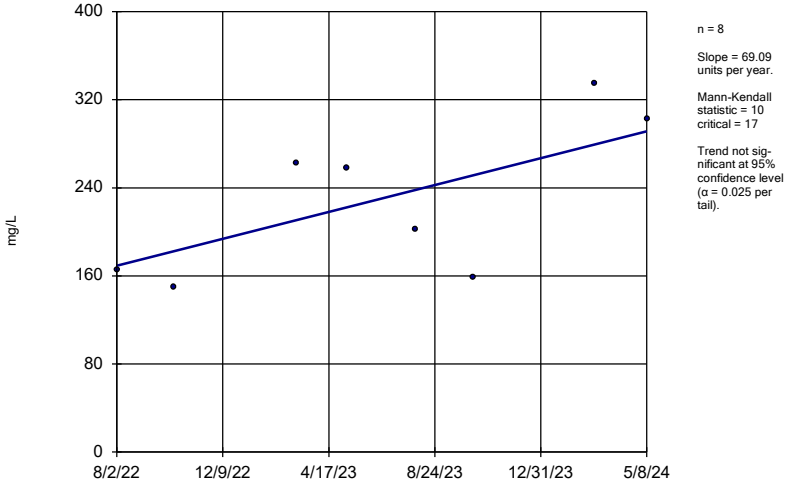
Calcium, Total

JCW-MW-18005



n = 8

Slope = 69.09 units per year.

Mann-Kendall statistic = 10 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

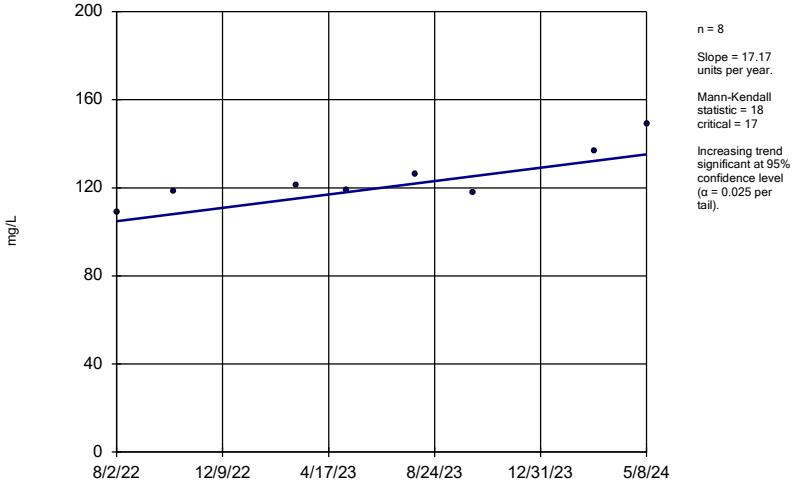
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

JCW-MW-18006



n = 8

Slope = 17.17 units per year.

Mann-Kendall statistic = 18 critical = 17

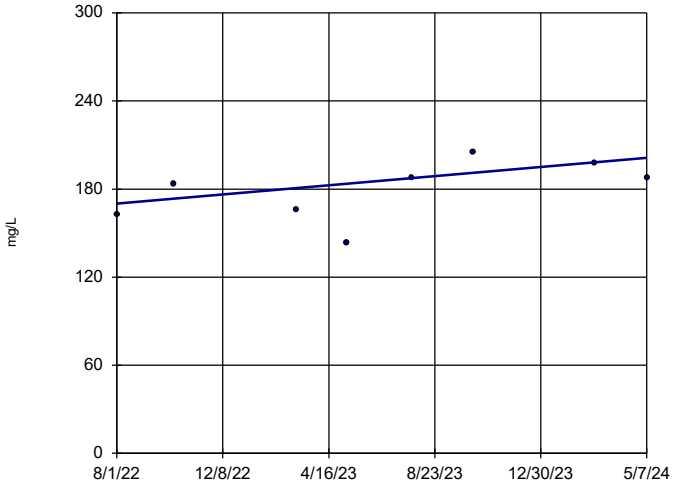
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Calcium, Total

MW-50



n = 8

Slope = 17.61 units per year.

Mann-Kendall statistic = 13
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

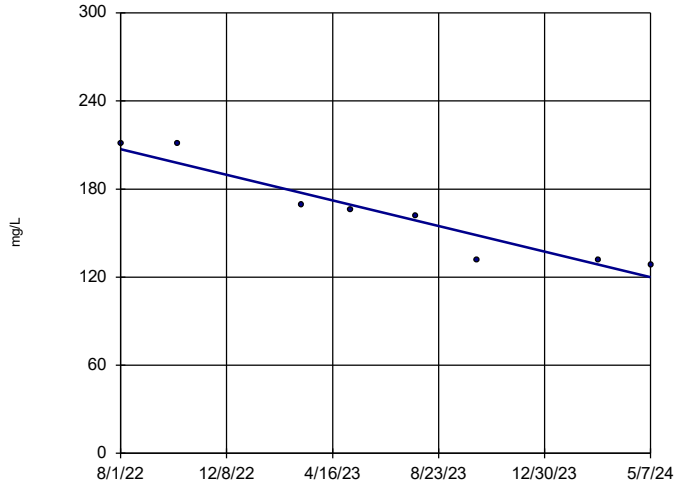
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-51



n = 8

Slope = -49.32 units per year.

Mann-Kendall statistic = -26
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

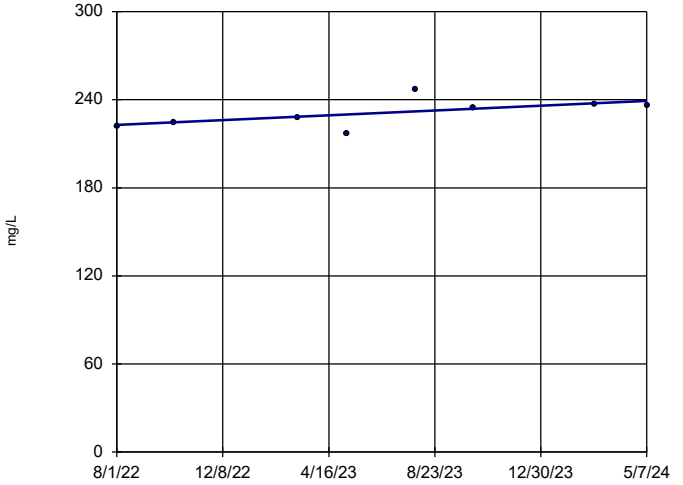
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-52



n = 8

Slope = 9.337 units per year.

Mann-Kendall statistic = 14
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

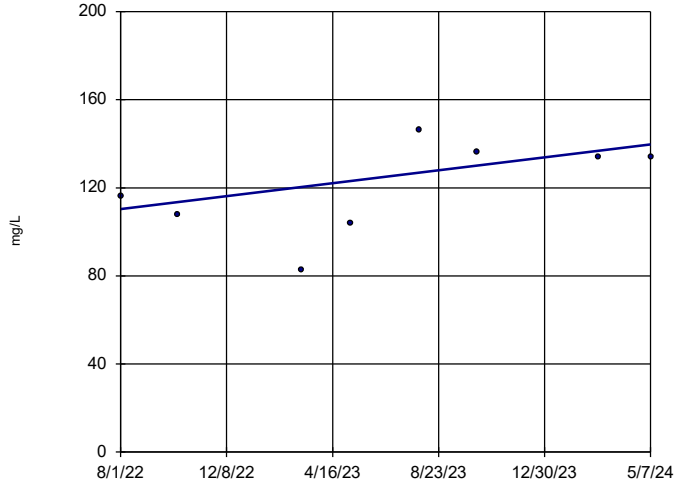
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-53



n = 8

Slope = 16.66 units per year.

Mann-Kendall statistic = 7
critical = 17

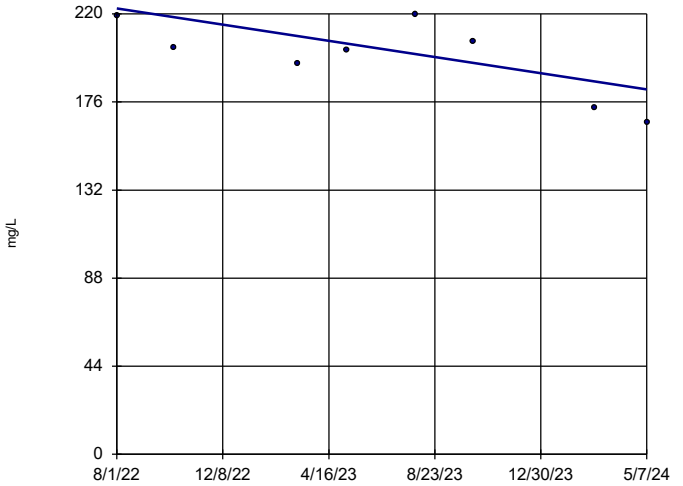
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Calcium, Total

MW-53R



n = 8

Slope = -22.83 units per year.

Mann-Kendall statistic = -12 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

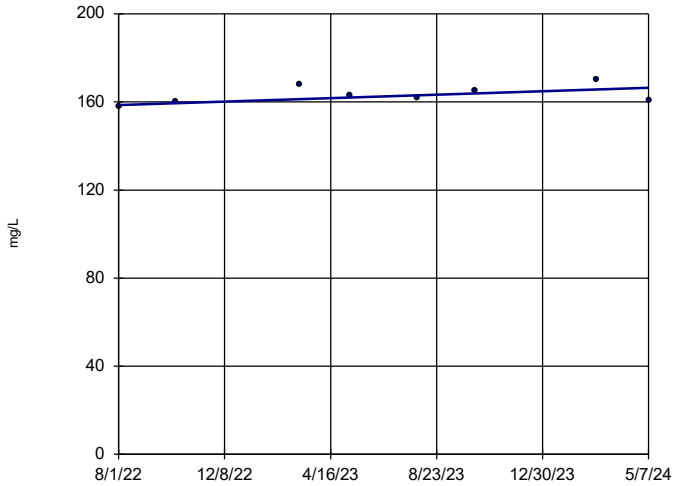
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-54R



n = 8

Slope = 4.391 units per year.

Mann-Kendall statistic = 10 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

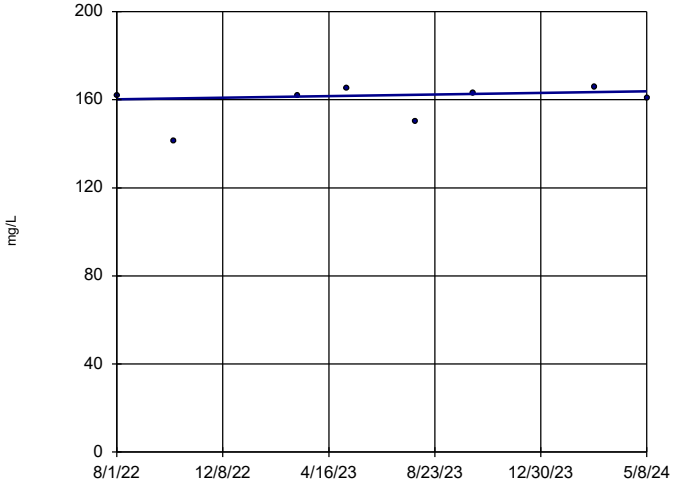
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

MW-55



n = 8

Slope = 2.107 units per year.

Mann-Kendall statistic = 7 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

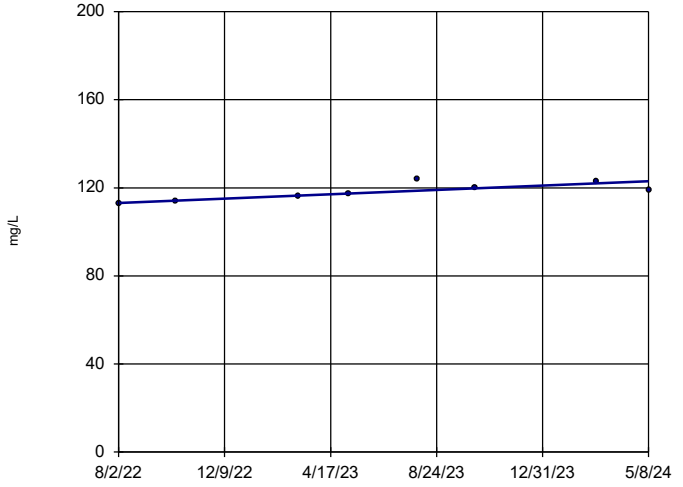
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Calcium, Total

OW-57ROUT



n = 8

Slope = 5.557 units per year.

Mann-Kendall statistic = 18 critical = 17

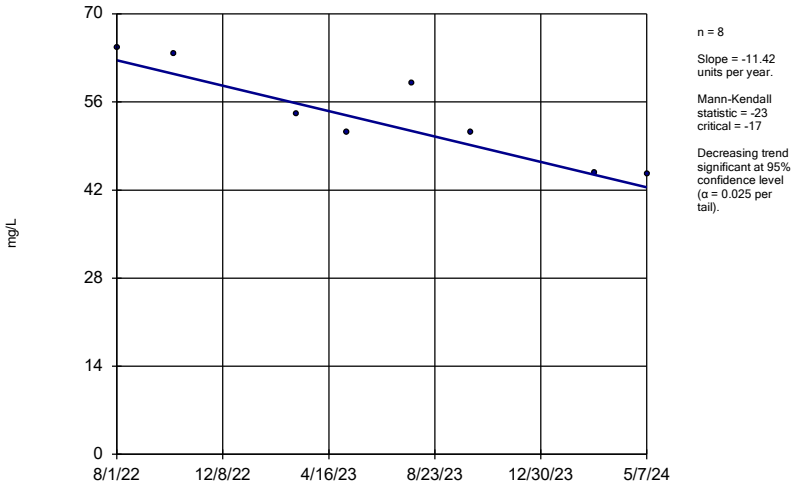
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Chloride

JCW-MW-18001



n = 8

Slope = -11.42 units per year.

Mann-Kendall statistic = -23 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

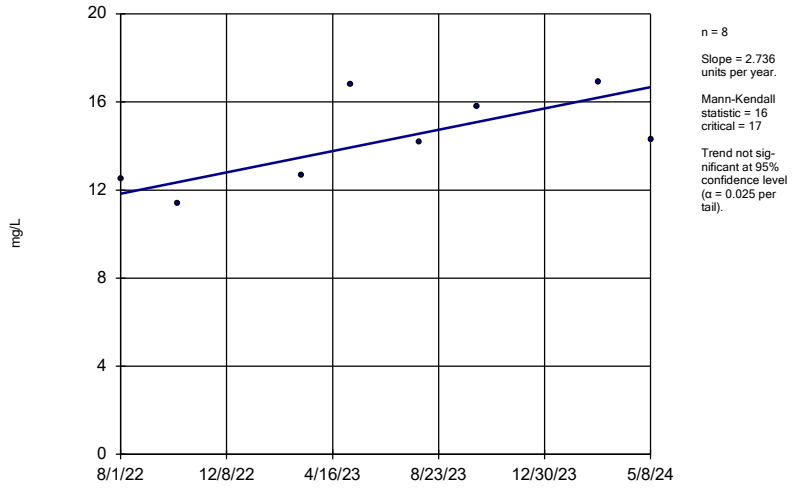
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

JCW-MW-18004



n = 8

Slope = 2.736 units per year.

Mann-Kendall statistic = 16 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

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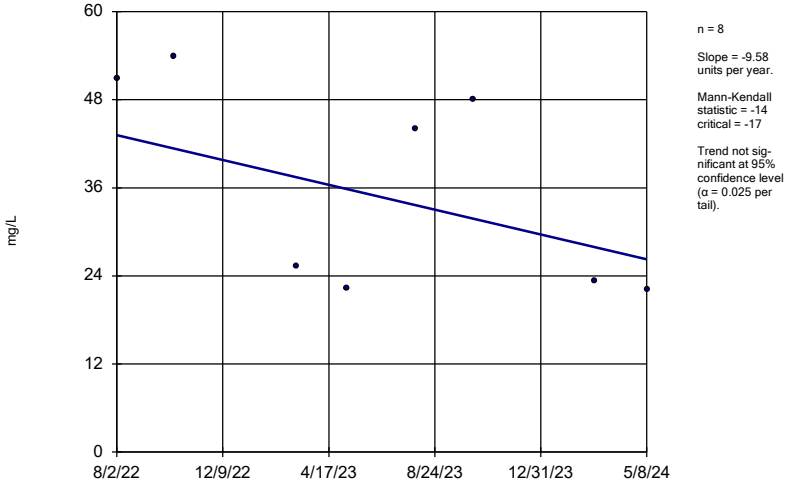
Chloride

JCW-MW-18005



n = 8

Slope = -9.58 units per year.

Mann-Kendall statistic = -14 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

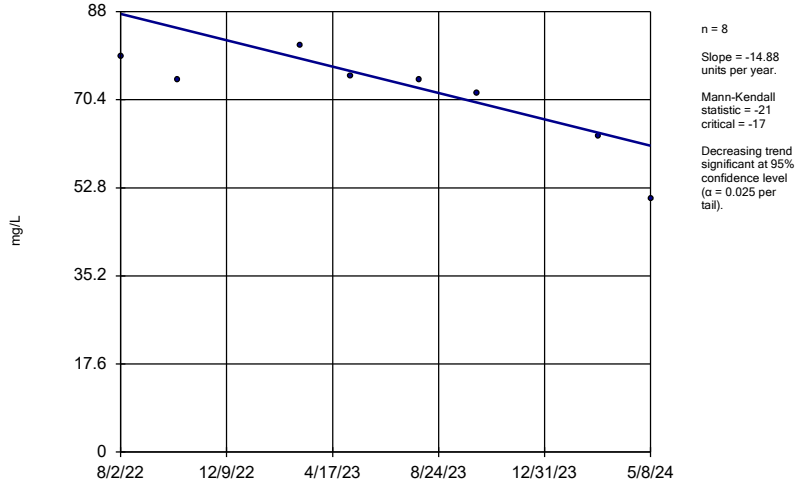
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

JCW-MW-18006



n = 8

Slope = -14.88 units per year.

Mann-Kendall statistic = -21 critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

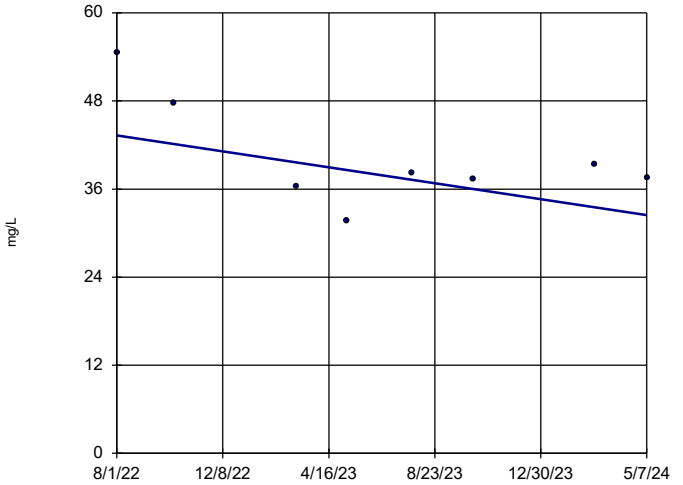
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-50



n = 8

Slope = -6.148 units per year.

Mann-Kendall statistic = -6
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

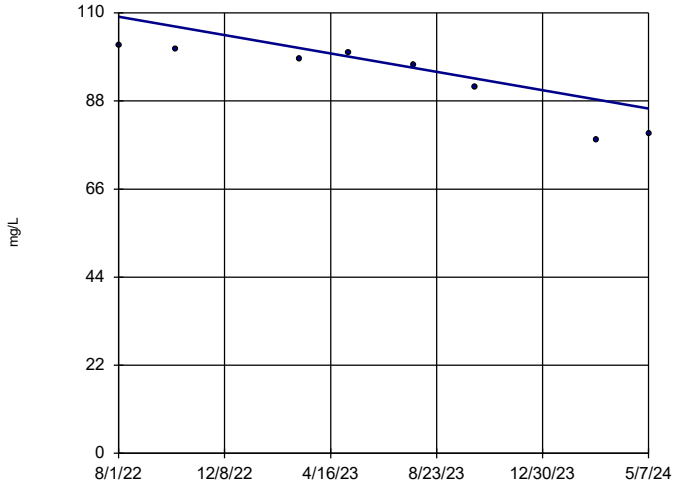
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-51



n = 8

Slope = -12.95 units per year.

Mann-Kendall statistic = -24
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

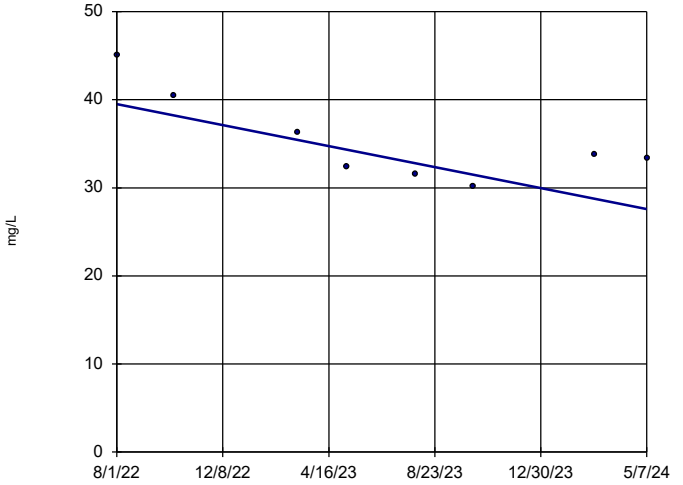
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-52



n = 8

Slope = -6.728 units per year.

Mann-Kendall statistic = -16
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

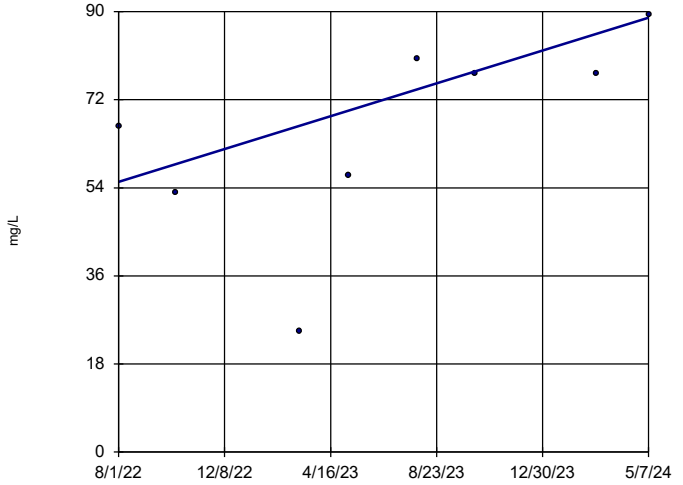
Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-53



n = 8

Slope = 18.99 units per year.

Mann-Kendall statistic = 15
critical = 17

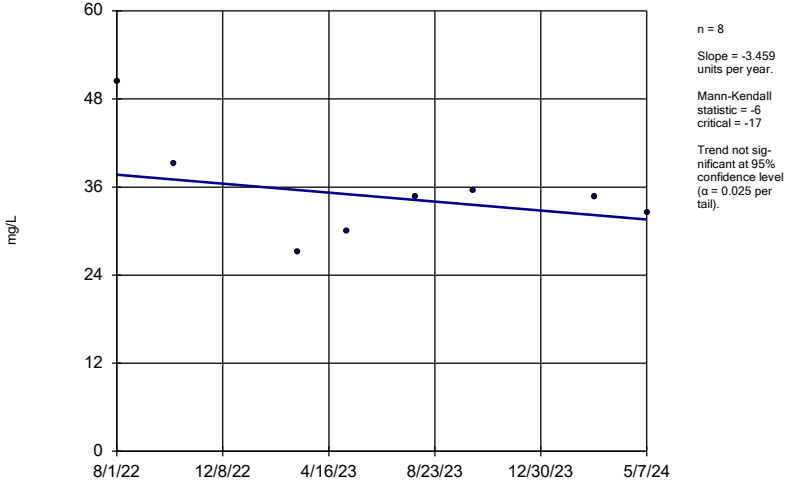
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:50 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Chloride

MW-53R



n = 8

Slope = -3.459 units per year.

Mann-Kendall statistic = -6
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

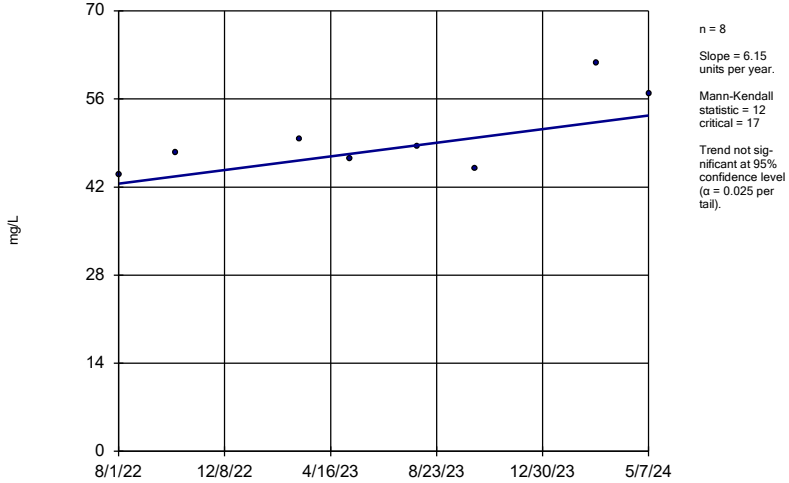
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-54R



n = 8

Slope = 6.15 units per year.

Mann-Kendall statistic = 12
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

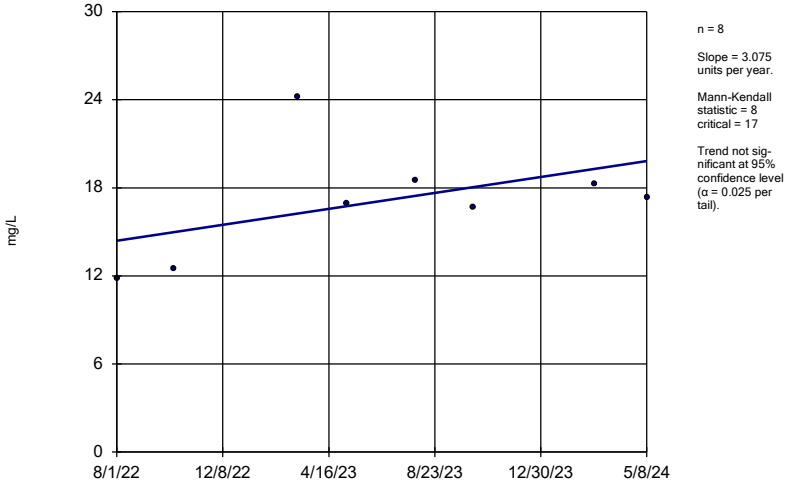
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

MW-55



n = 8

Slope = 3.075 units per year.

Mann-Kendall statistic = 8
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

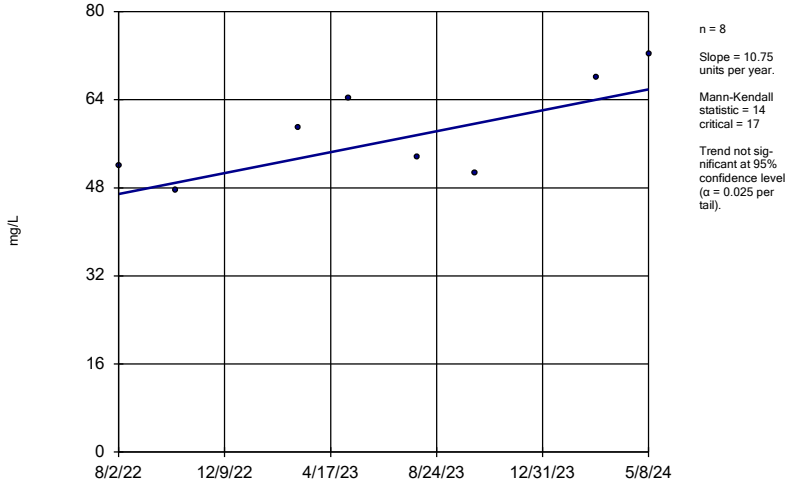
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Chloride

OW-57ROUT



n = 8

Slope = 10.75 units per year.

Mann-Kendall statistic = 14
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

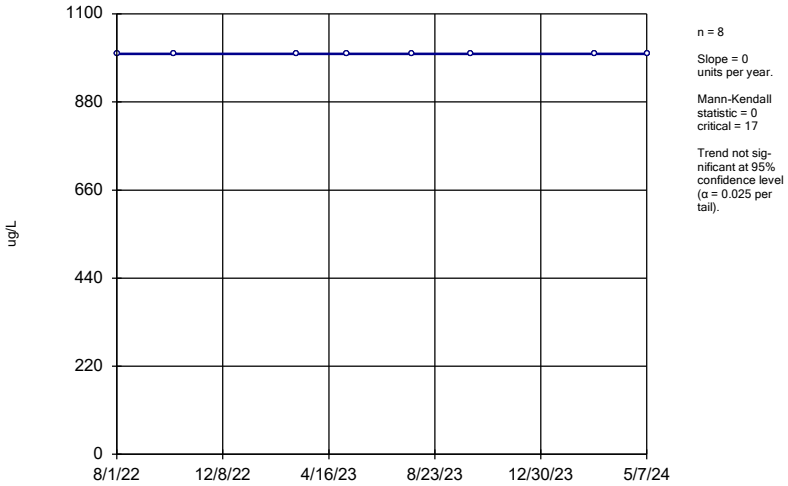
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18001



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

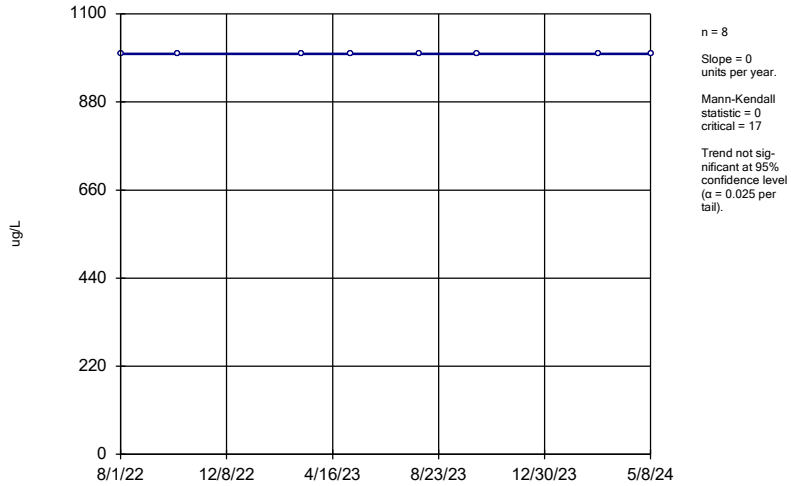
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18004



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

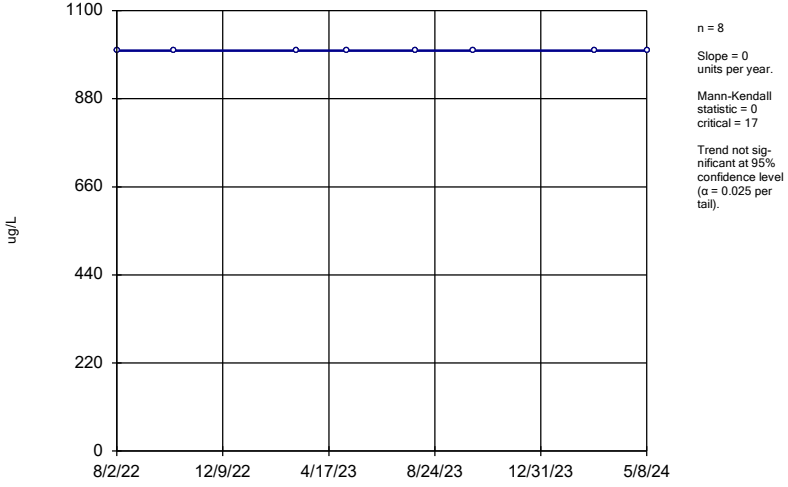
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18005



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

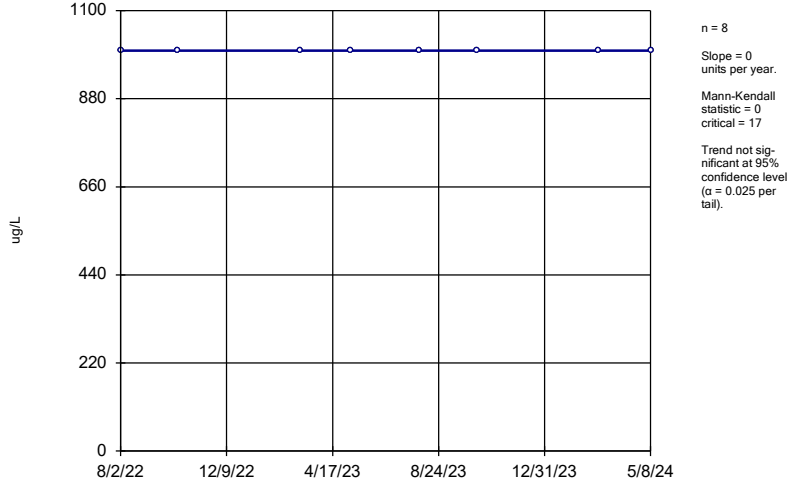
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

JCW-MW-18006



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

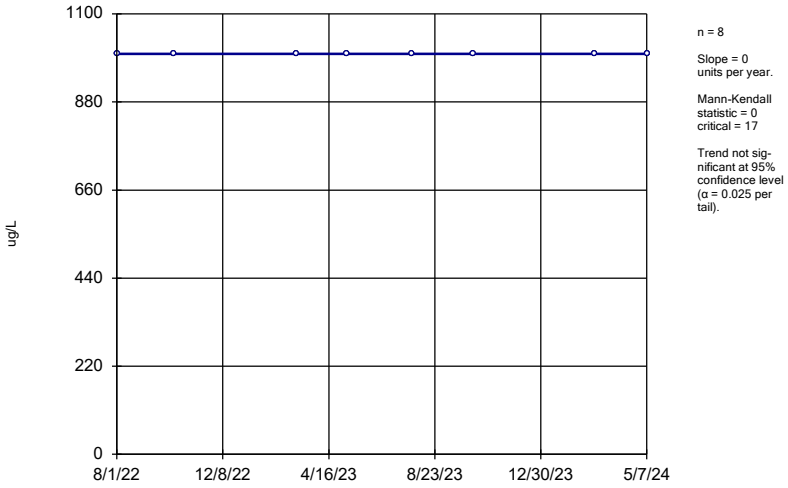
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-50



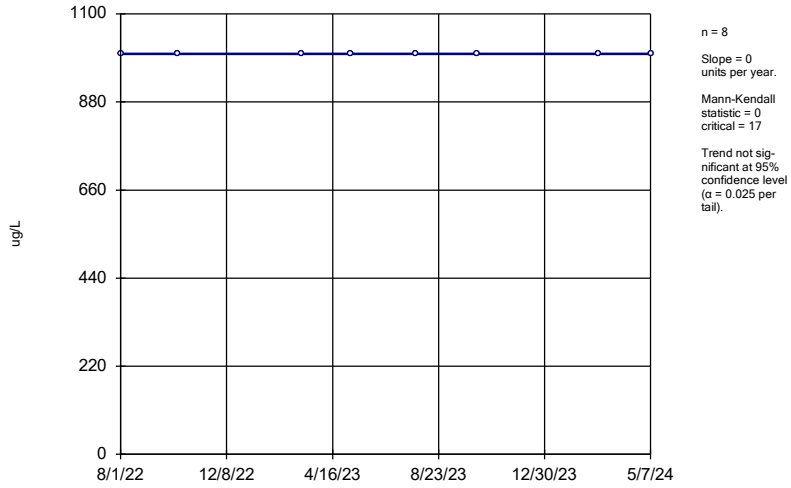
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-51



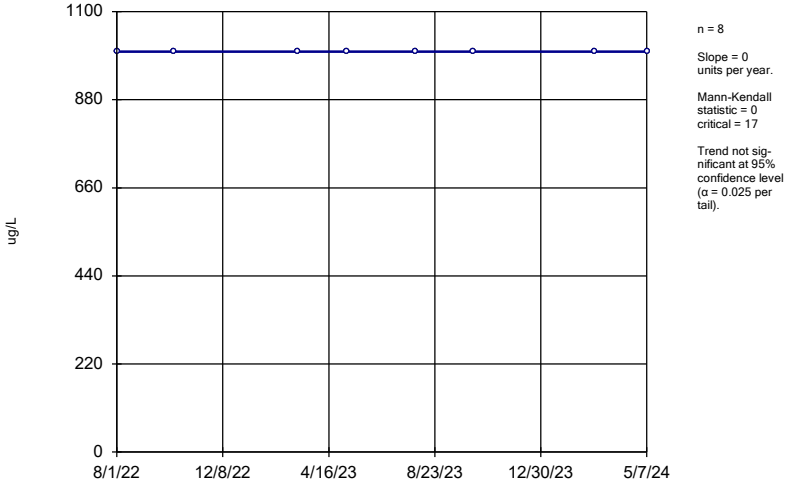
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-52



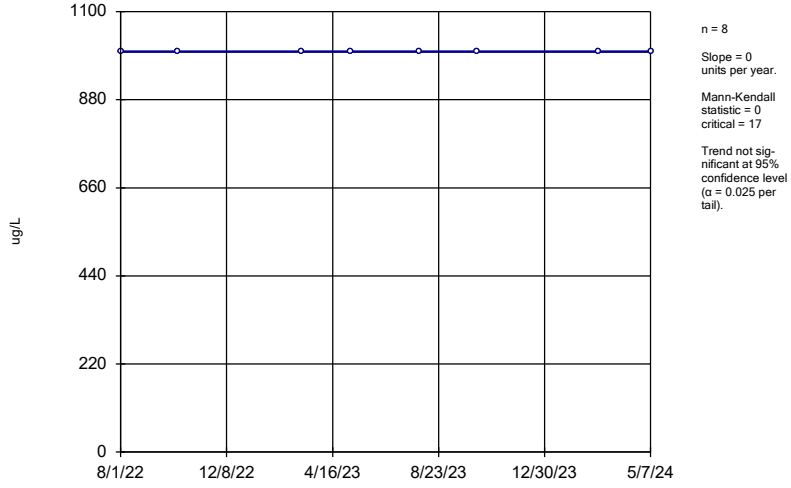
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-53



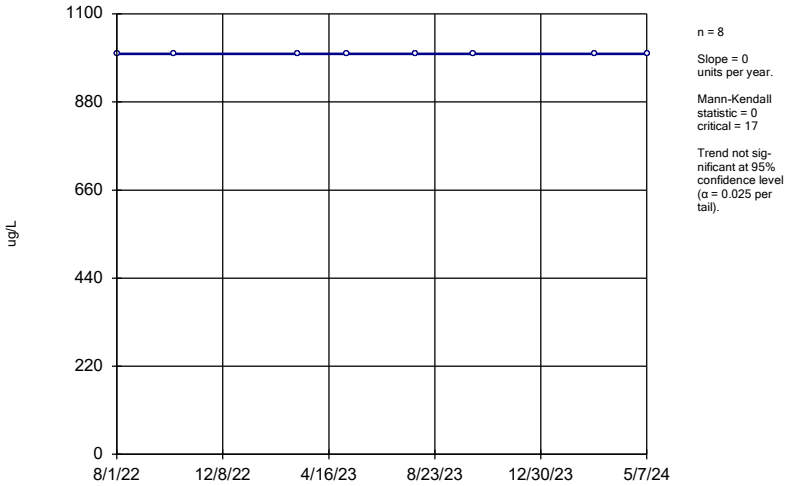
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-53R



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

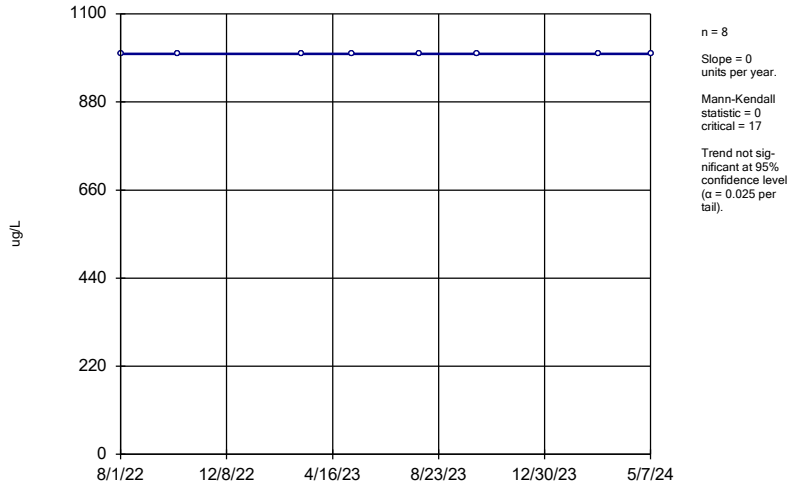
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-54R



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

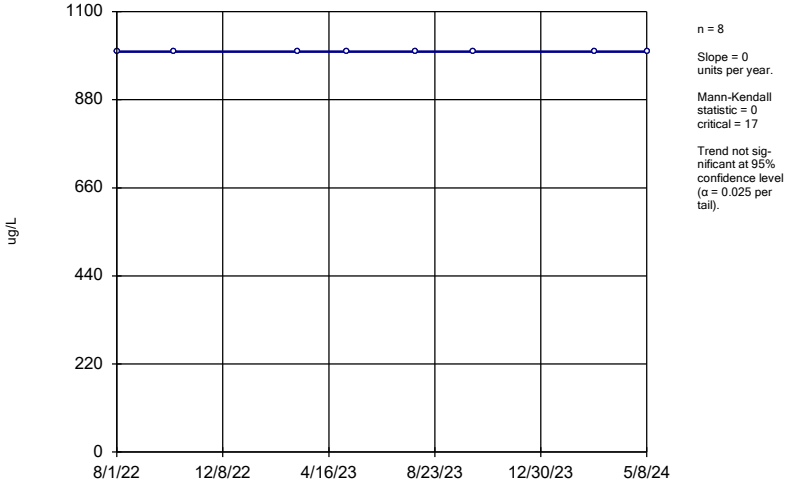
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

MW-55



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

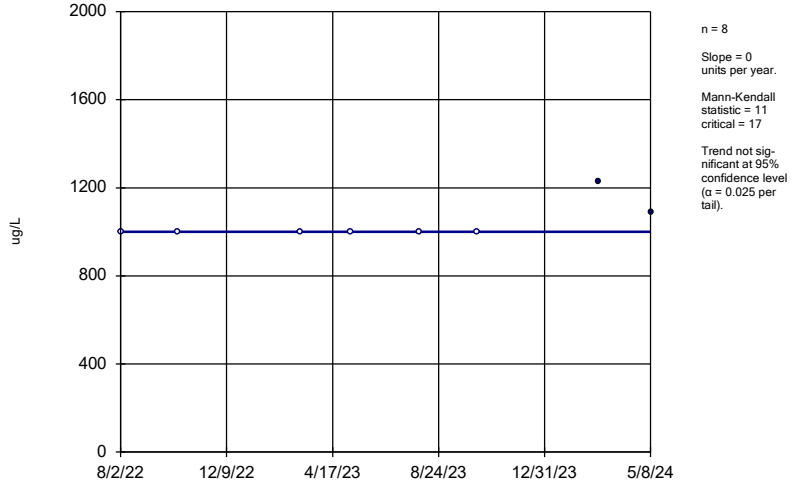
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG
Hollow symbols indicate censored values.

Fluoride

OW-57ROUT



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 11 critical = 17

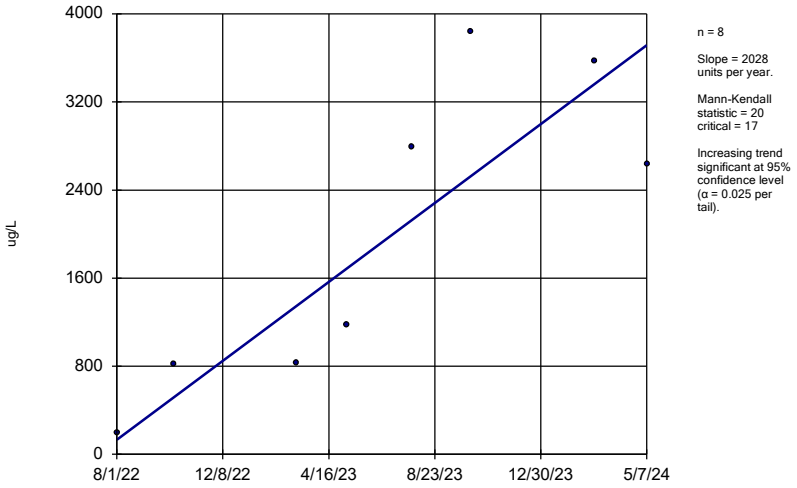
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Iron, Total

JCW-MW-18001



n = 8

Slope = 2028 units per year.

Mann-Kendall statistic = 20 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

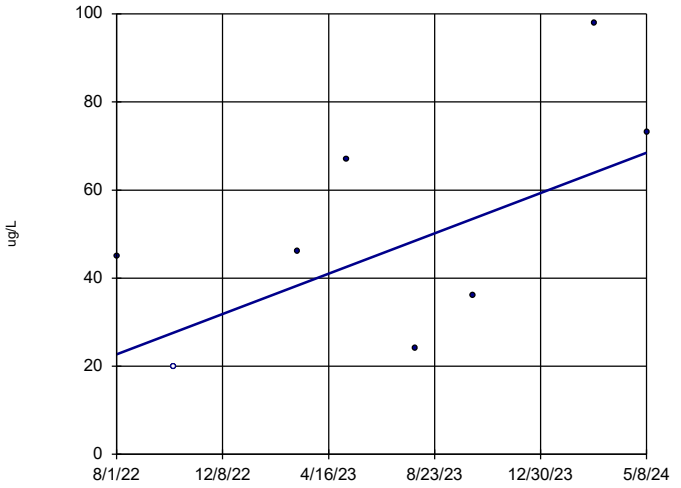
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Hollow symbols indicate censored values.

Iron, Total

JCW-MW-18004



n = 8

Slope = 25.86 units per year.

Mann-Kendall statistic = 12 critical = 17

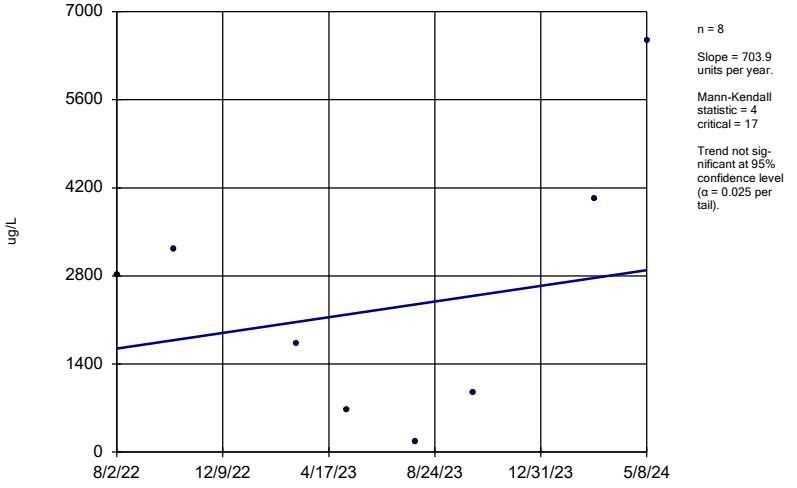
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Iron, Total

JCW-MW-18005



n = 8

Slope = 703.9 units per year.

Mann-Kendall statistic = 4 critical = 17

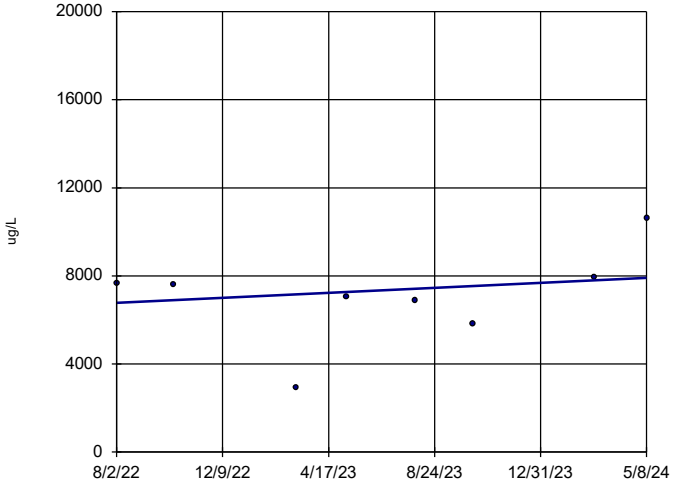
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Iron, Total

JCW-MW-18006



n = 8

Slope = 640.5 units per year.

Mann-Kendall statistic = 4 critical = 17

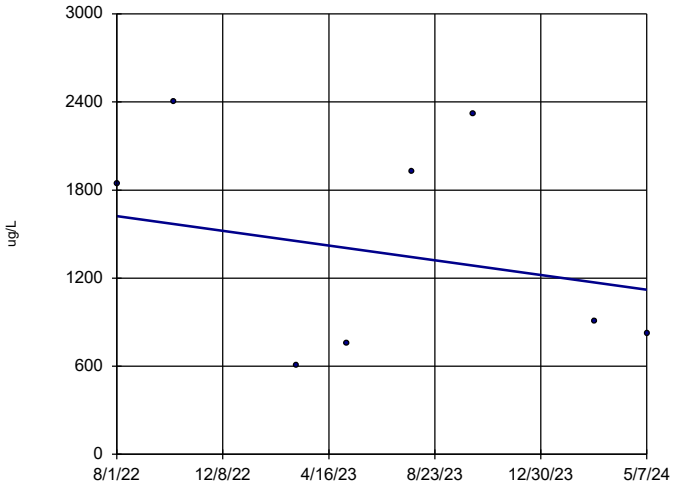
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Iron, Total

MW-50



n = 8

Slope = -283.4 units per year.

Mann-Kendall statistic = -2 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

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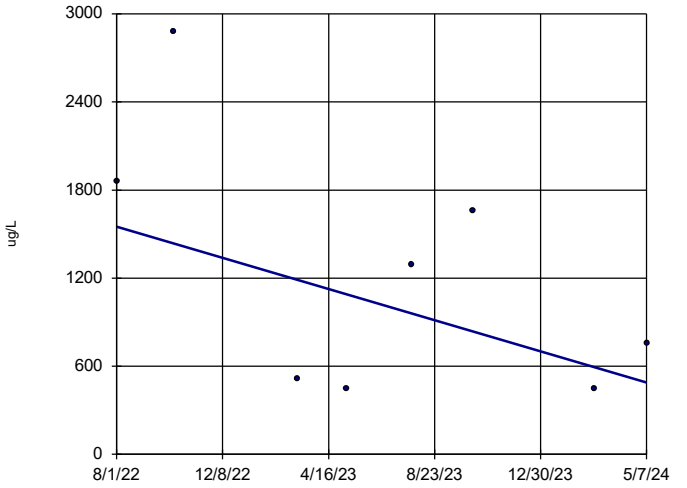
Iron, Total

MW-51



n = 8

Slope = -601 units per year.

Mann-Kendall statistic = -10 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

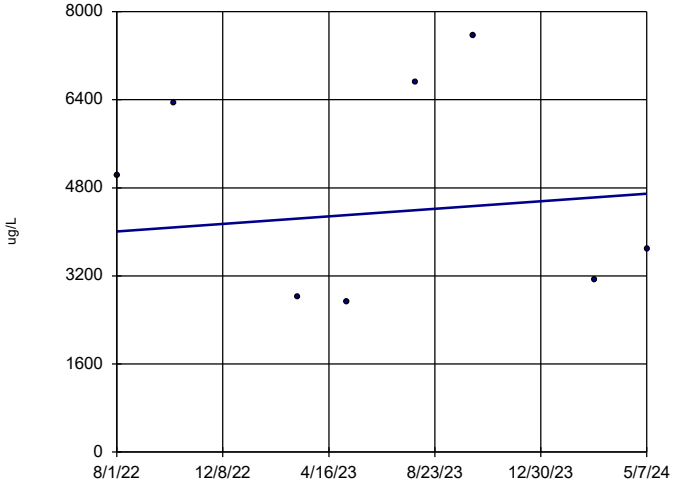
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-52



n = 8

Slope = 387.1 units per year.

Mann-Kendall statistic = 2 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

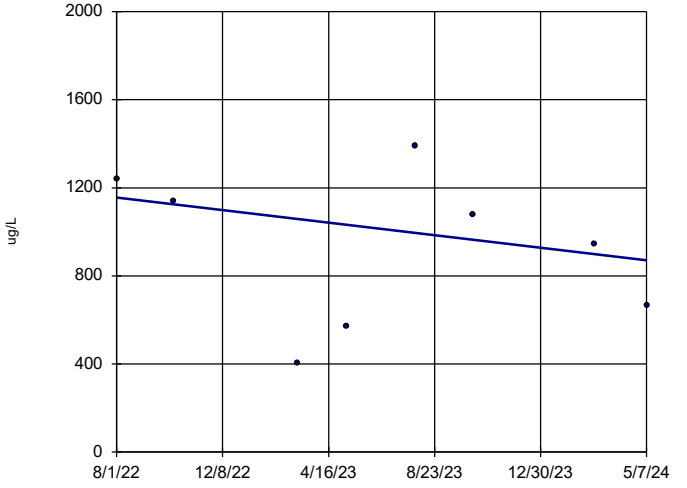
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-53



n = 8

Slope = -160.7 units per year.

Mann-Kendall statistic = -6 critical = -17

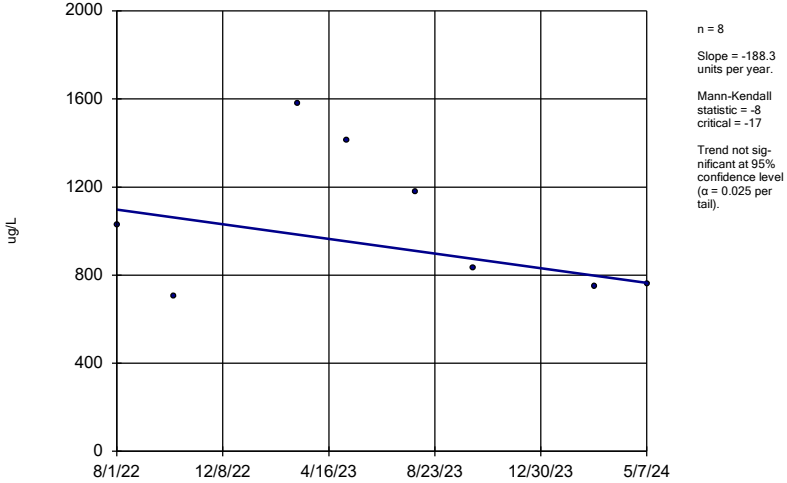
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Iron, Total

MW-53R



n = 8

Slope = -188.3 units per year.

Mann-Kendall statistic = -8 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

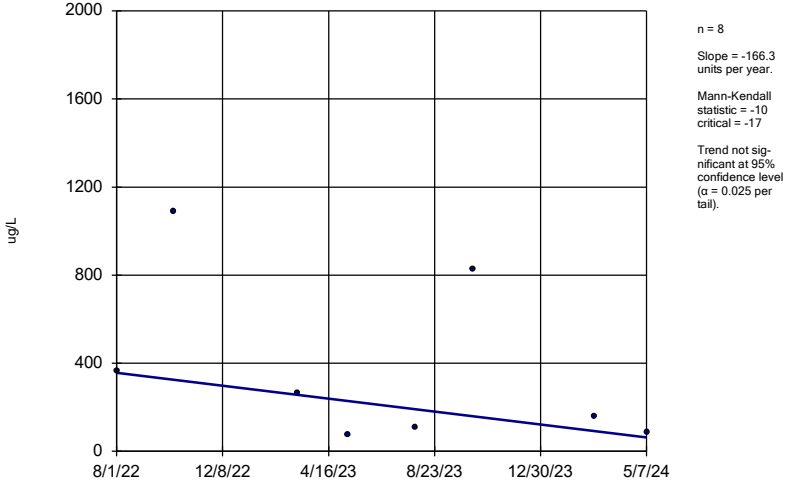
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-54R



n = 8

Slope = -166.3 units per year.

Mann-Kendall statistic = -10 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

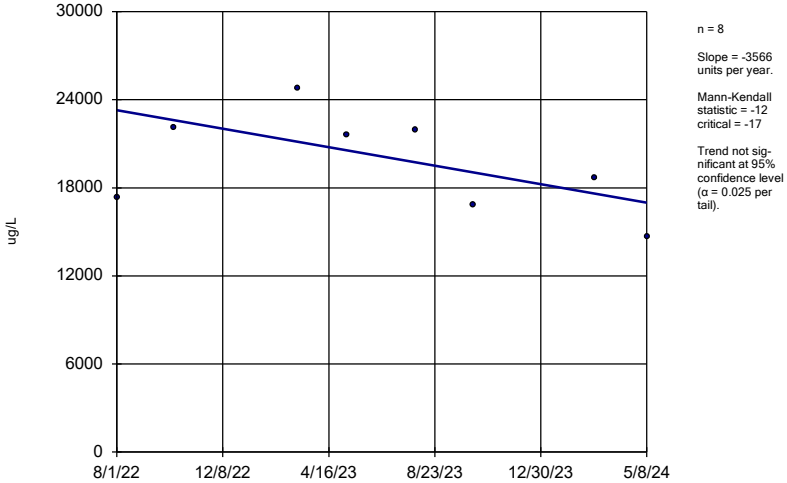
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

MW-55



n = 8

Slope = -3566 units per year.

Mann-Kendall statistic = -12 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

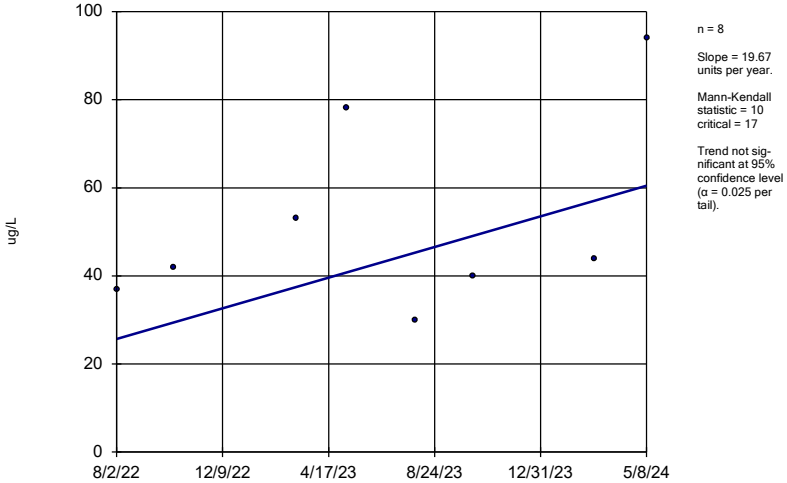
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Iron, Total

OW-57ROUT



n = 8

Slope = 19.67 units per year.

Mann-Kendall statistic = 10 critical = 17

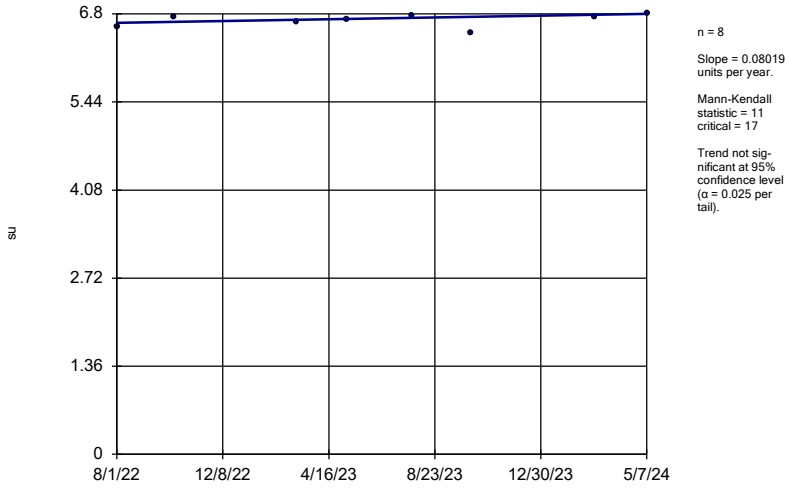
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

pH, Field

JCW-MW-18001



n = 8

Slope = 0.08019 units per year.

Mann-Kendall statistic = 11 critical = 17

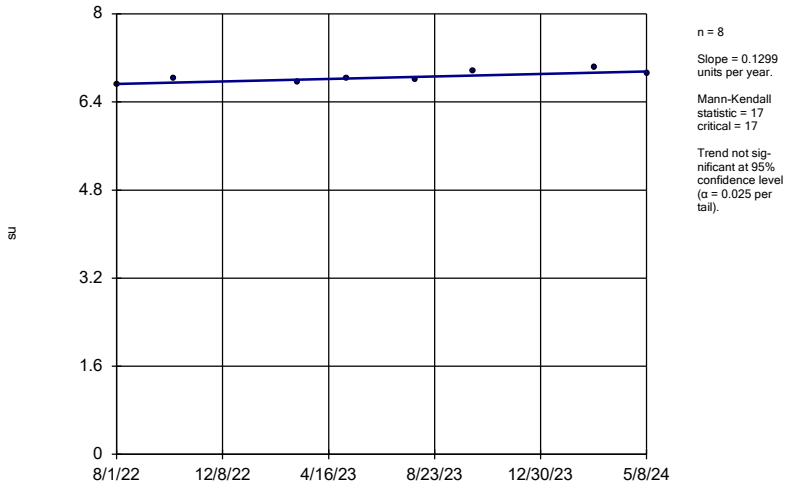
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

pH, Field

JCW-MW-18004



n = 8

Slope = 0.1299 units per year.

Mann-Kendall statistic = 17 critical = 17

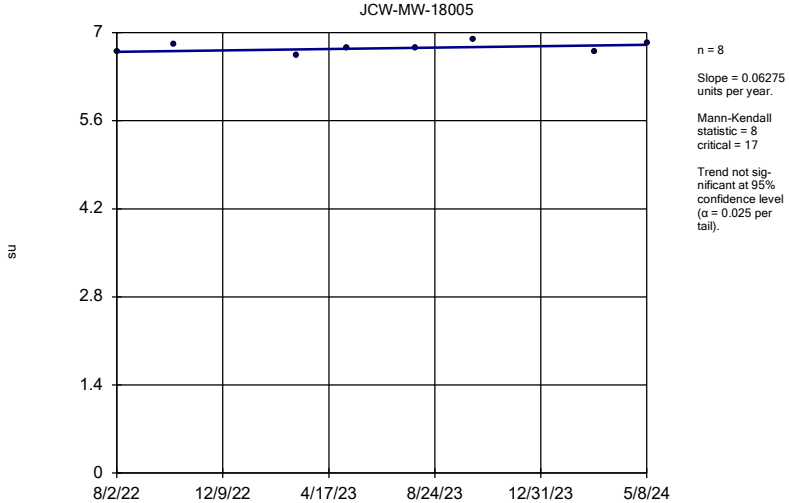
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

pH, Field

JCW-MW-18005



n = 8

Slope = 0.06275 units per year.

Mann-Kendall statistic = 8 critical = 17

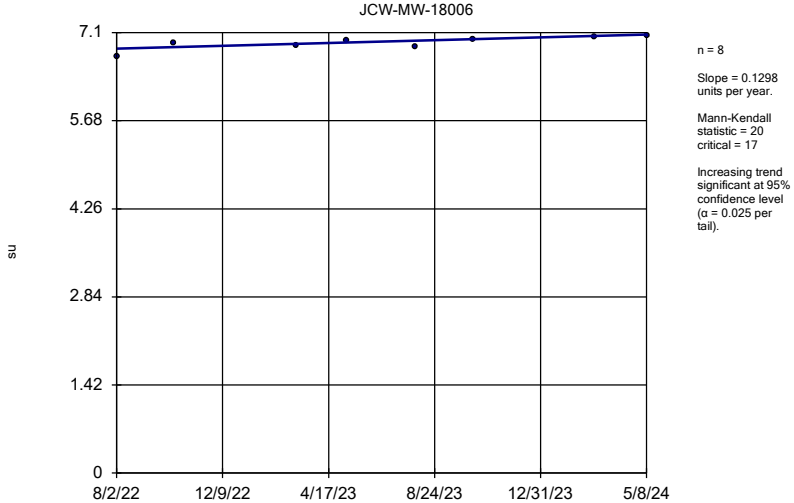
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

pH, Field

JCW-MW-18006



n = 8

Slope = 0.1298 units per year.

Mann-Kendall statistic = 20 critical = 17

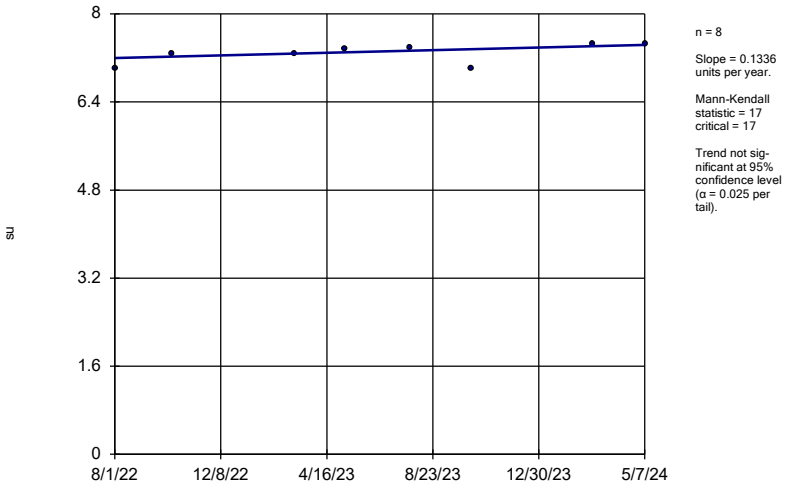
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

pH, Field

MW-50



n = 8

Slope = 0.1336 units per year.

Mann-Kendall statistic = 17 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

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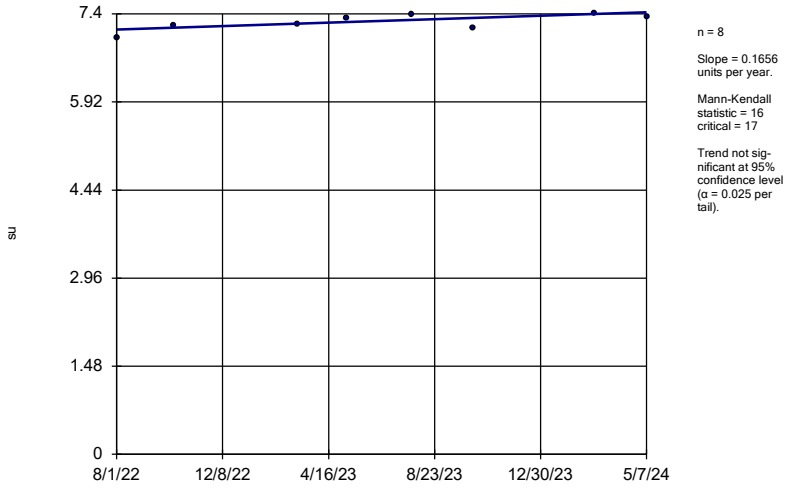
pH, Field

MW-51



n = 8

Slope = 0.1656 units per year.

Mann-Kendall statistic = 16 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

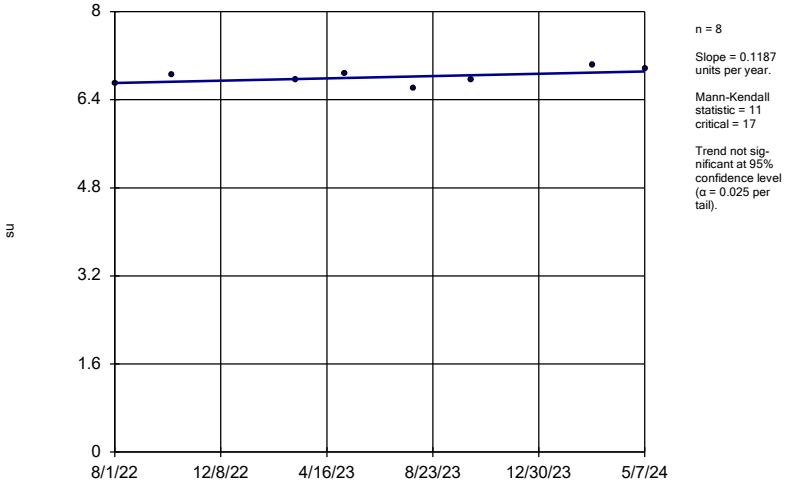
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-52



n = 8

Slope = 0.1187 units per year.

Mann-Kendall statistic = 11 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

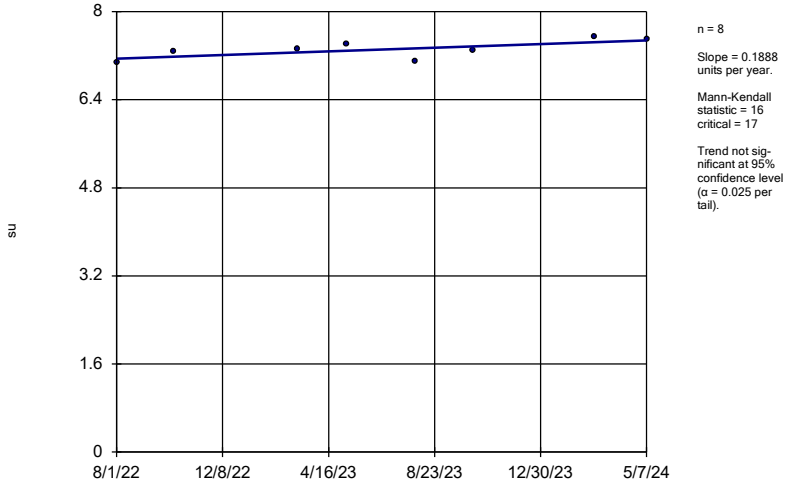
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-53



n = 8

Slope = 0.1888 units per year.

Mann-Kendall statistic = 16 critical = 17

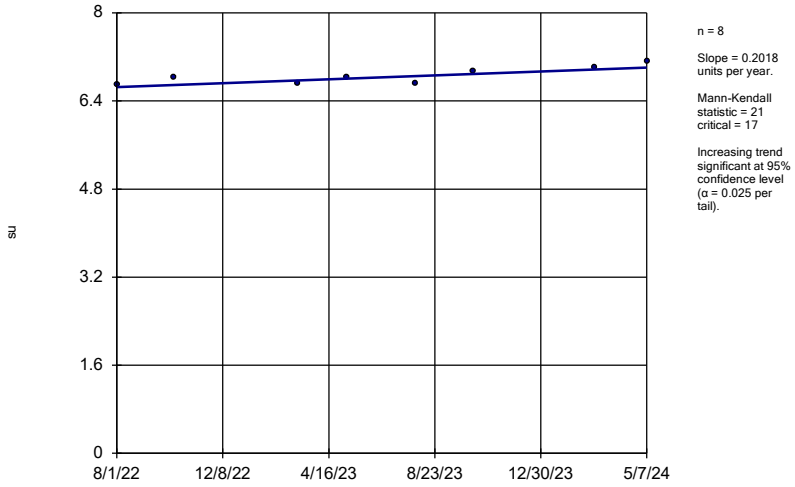
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

pH, Field

MW-53R



n = 8

Slope = 0.2018 units per year.

Mann-Kendall statistic = 21 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

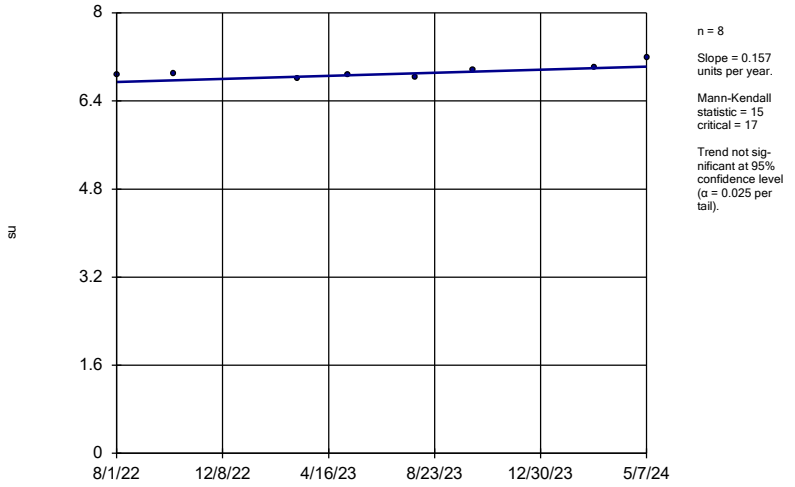
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-54R



n = 8

Slope = 0.157 units per year.

Mann-Kendall statistic = 15 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

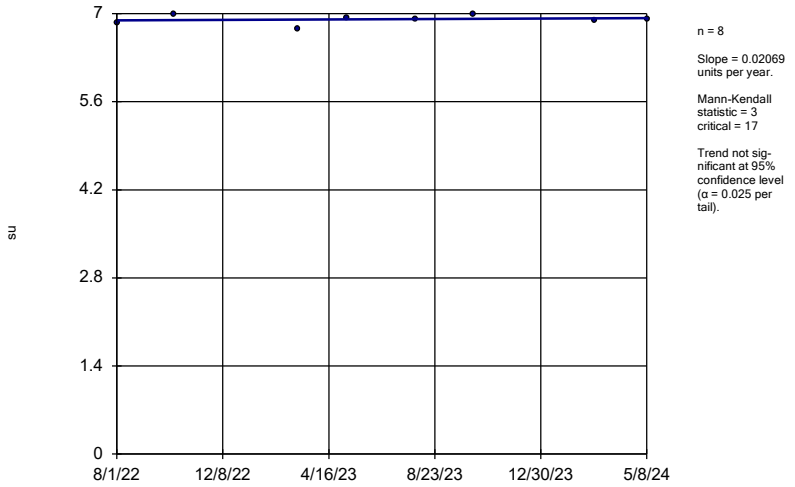
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

pH, Field

MW-55



n = 8

Slope = 0.02069 units per year.

Mann-Kendall statistic = 3 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

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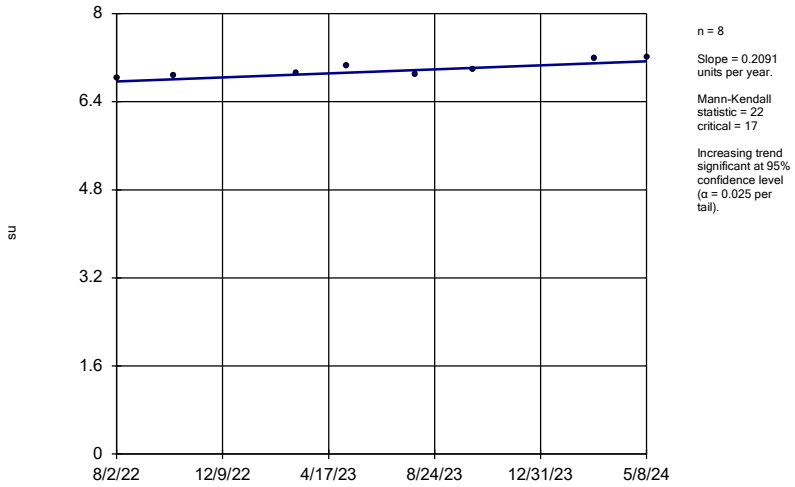
pH, Field

OW-57ROUT



n = 8

Slope = 0.2091 units per year.

Mann-Kendall statistic = 22 critical = 17

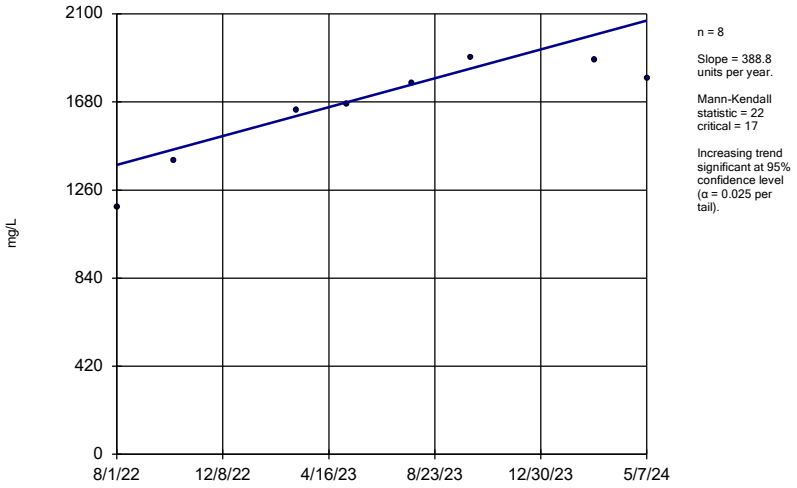
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sulfate

JCW-MW-18001



n = 8

Slope = 388.8 units per year.

Mann-Kendall statistic = 22 critical = 17

Increasing trend significant at 95% confidence level (α = 0.025 per tail).

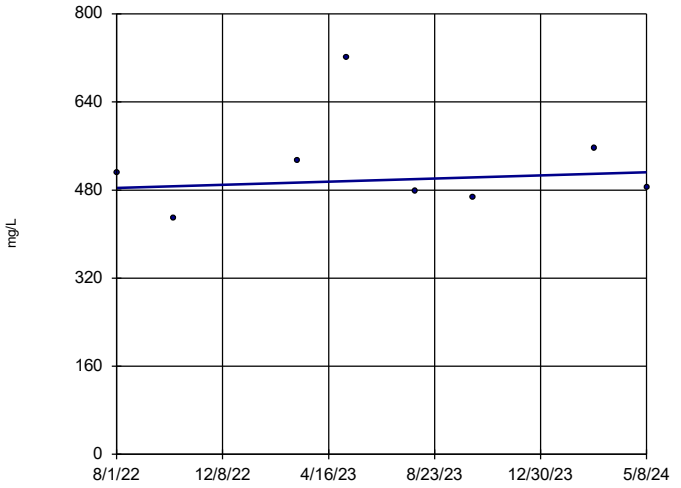
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

JCW-MW-18004



n = 8

Slope = 15.98 units per year.

Mann-Kendall statistic = 2 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

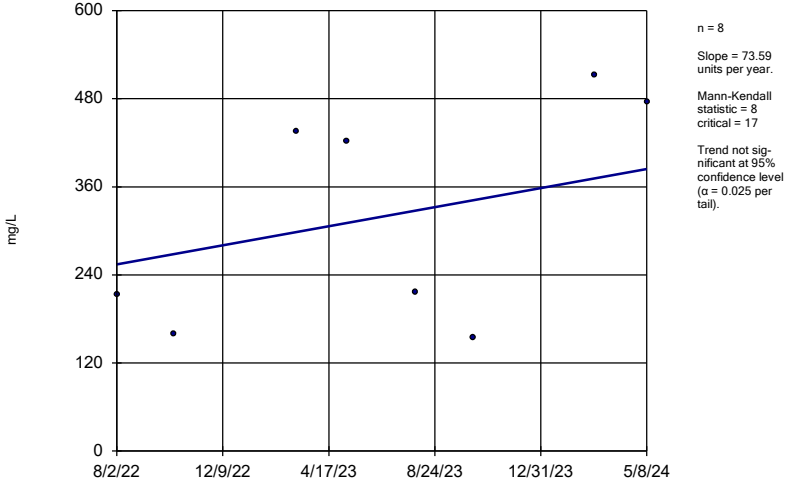
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

JCW-MW-18005



n = 8

Slope = 73.59 units per year.

Mann-Kendall statistic = 8 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

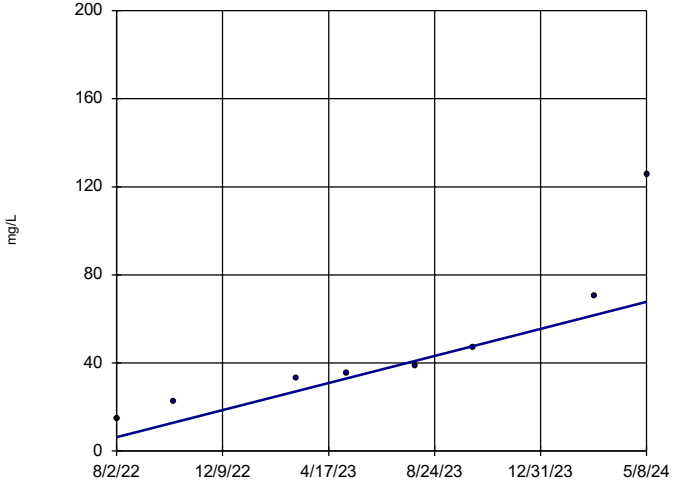
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

JCW-MW-18006



n = 8

Slope = 34.72 units per year.

Mann-Kendall statistic = 28 critical = 17

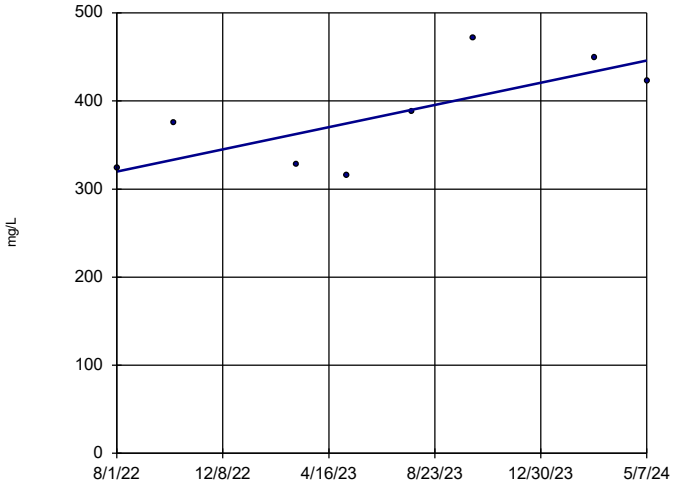
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sulfate

MW-50



n = 8

Slope = 71.42 units per year.

Mann-Kendall statistic = 14
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

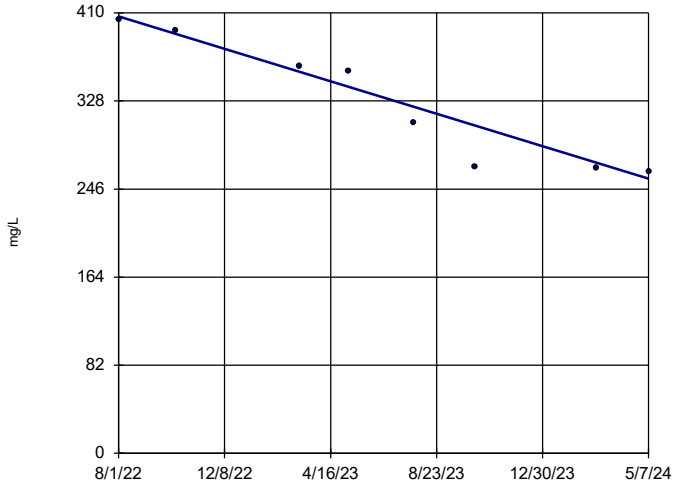
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-51



n = 8

Slope = -85.36 units per year.

Mann-Kendall statistic = -28
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

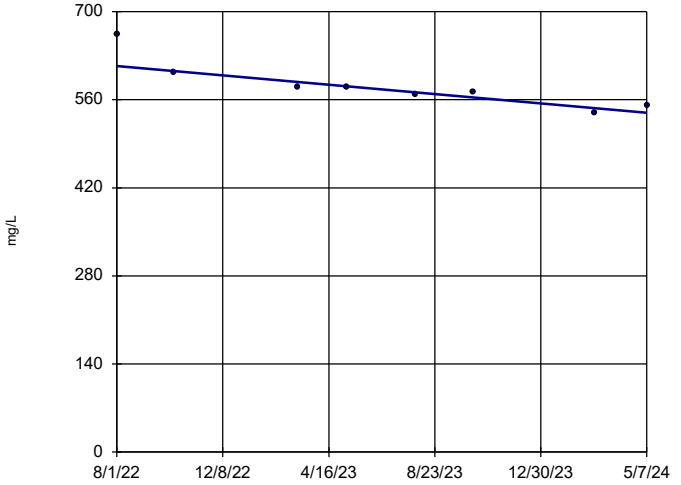
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-52



n = 8

Slope = -41.78 units per year.

Mann-Kendall statistic = -23
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

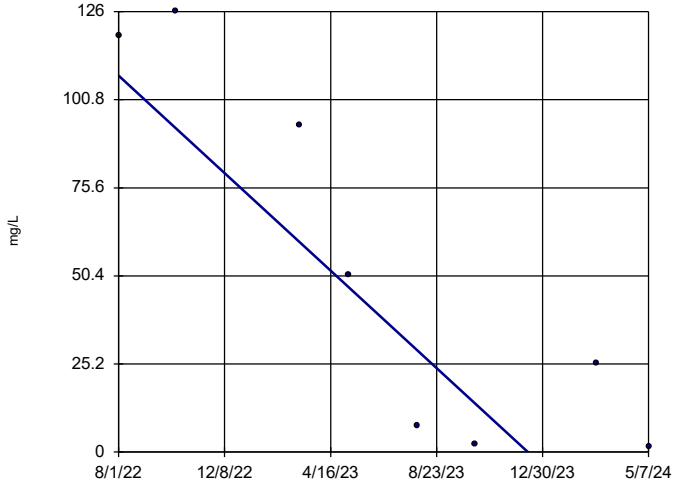
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-53



n = 8

Slope = -78.93 units per year.

Mann-Kendall statistic = -22
critical = -17

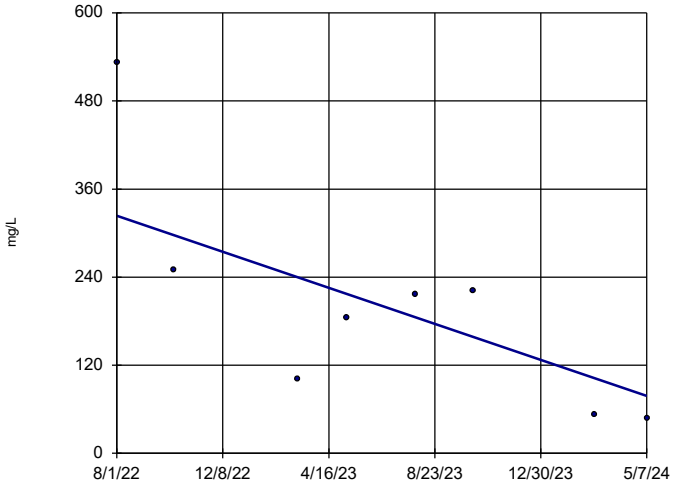
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sulfate

MW-53R



n = 8

Slope = -138.8 units per year.

Mann-Kendall statistic = -16
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

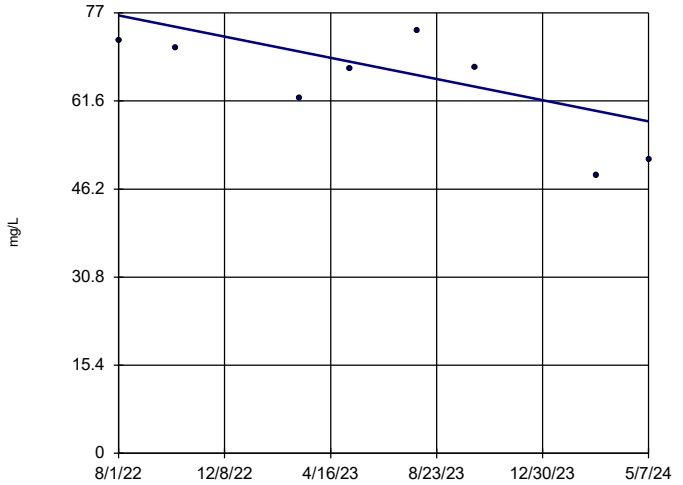
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-54R



n = 8

Slope = -10.48 units per year.

Mann-Kendall statistic = -12
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

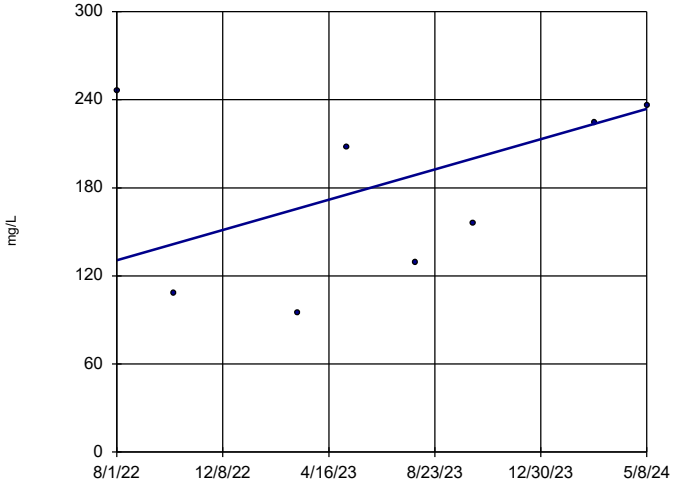
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

MW-55



n = 8

Slope = 58.28 units per year.

Mann-Kendall statistic = 8
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

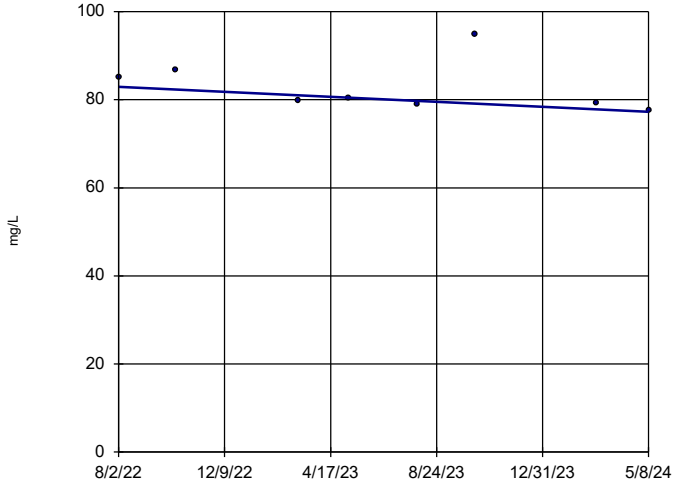
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Sulfate

OW-57ROUT



n = 8

Slope = -3.237 units per year.

Mann-Kendall statistic = -12
critical = -17

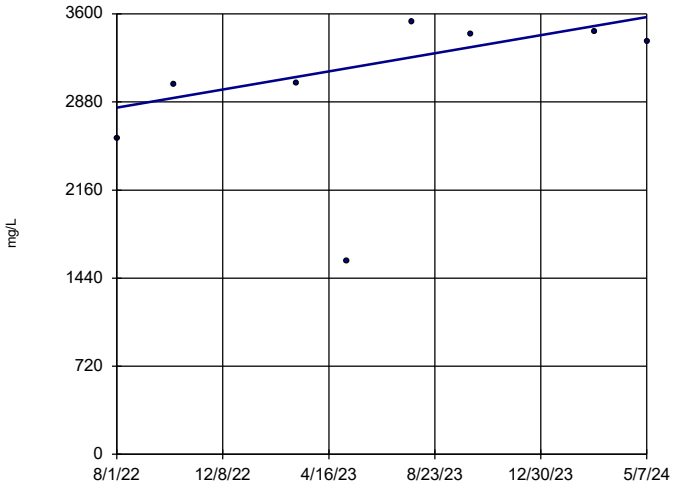
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Total Dissolved Solids

JCW-MW-18001



n = 8

Slope = 419 units per year.

Mann-Kendall statistic = 12 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

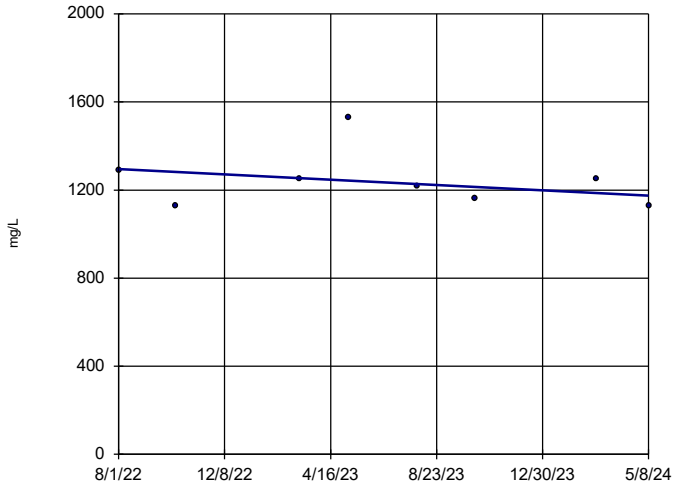
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

JCW-MW-18004



n = 8

Slope = -68.28 units per year.

Mann-Kendall statistic = -8 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

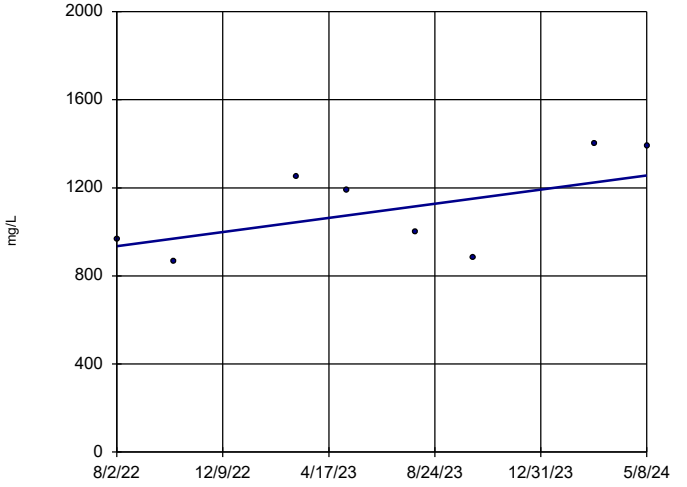
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

JCW-MW-18005



n = 8

Slope = 182.2 units per year.

Mann-Kendall statistic = 10 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

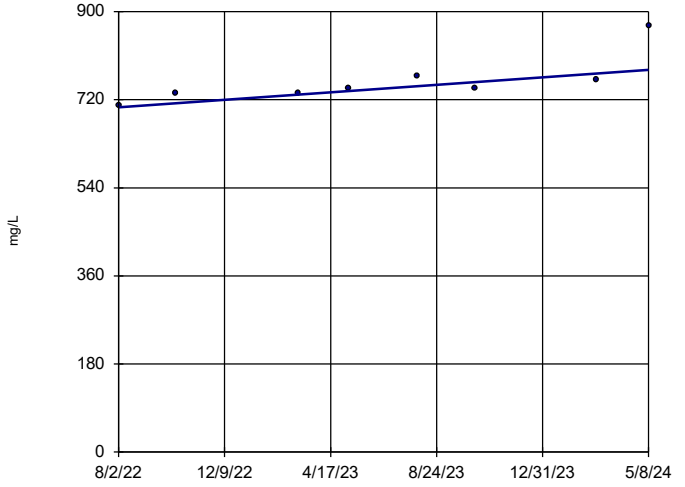
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

JCW-MW-18006



n = 8

Slope = 43.32 units per year.

Mann-Kendall statistic = 24 critical = 17

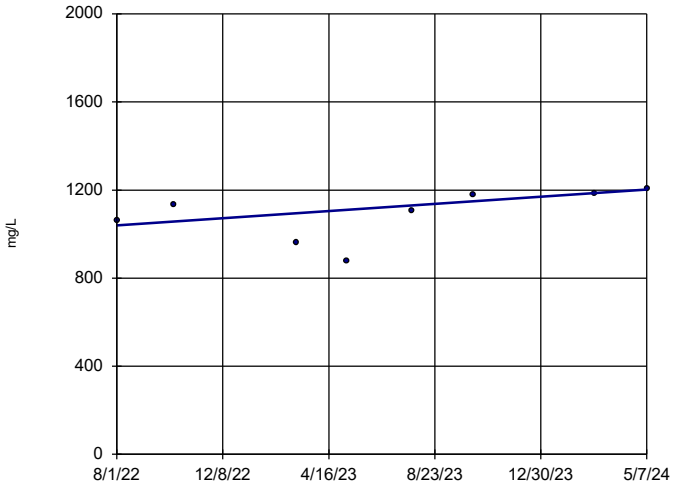
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Total Dissolved Solids

MW-50



n = 8

Slope = 91.49 units per year.

Mann-Kendall statistic = 16
critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

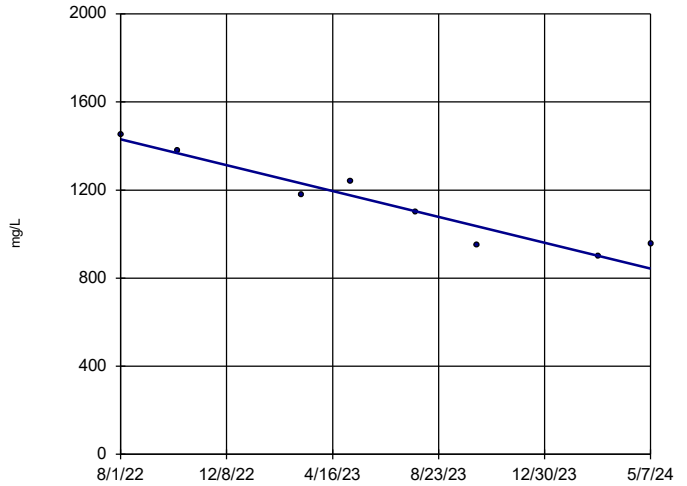
Sen's Slope Estimator Analysis Run 6/3/2024 10:51 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-51



n = 8

Slope = -332.4 units per year.

Mann-Kendall statistic = -22
critical = -17

Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

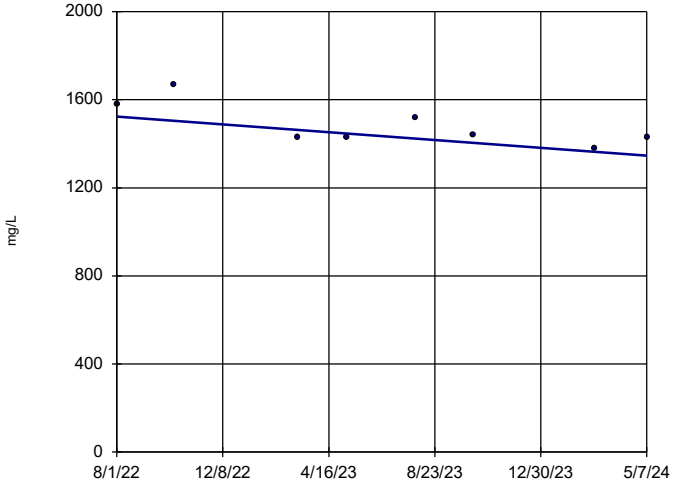
Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-52



n = 8

Slope = -100.9 units per year.

Mann-Kendall statistic = -13
critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

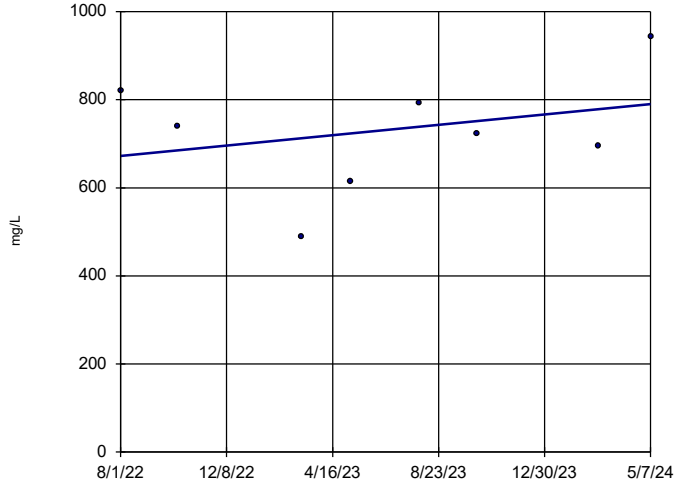
Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-53



n = 8

Slope = 66.8 units per year.

Mann-Kendall statistic = 2
critical = 17

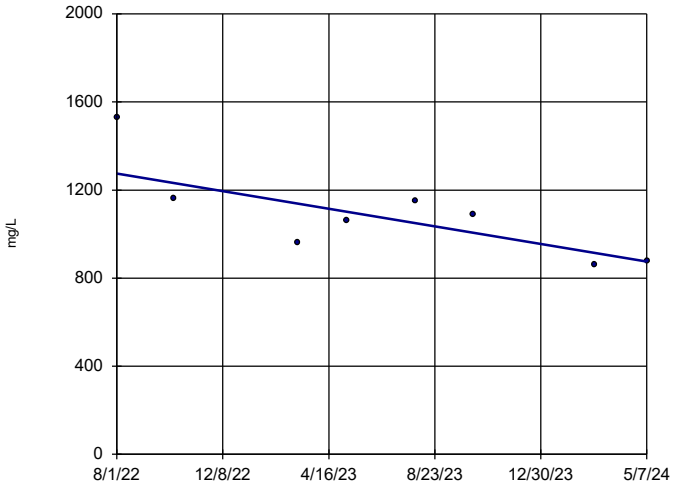
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Total Dissolved Solids

MW-53R



n = 8

Slope = -225.9 units per year.

Mann-Kendall statistic = -16 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

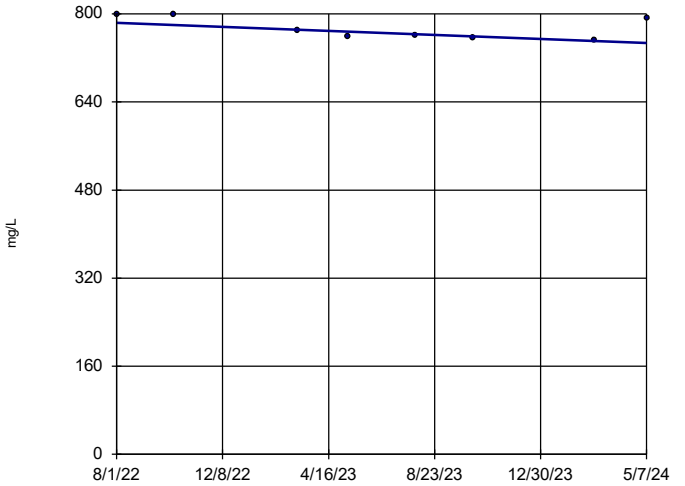
Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-54R



n = 8

Slope = -20.48 units per year.

Mann-Kendall statistic = -16 critical = -17

Trend not significant at 95% confidence level (α = 0.025 per tail).

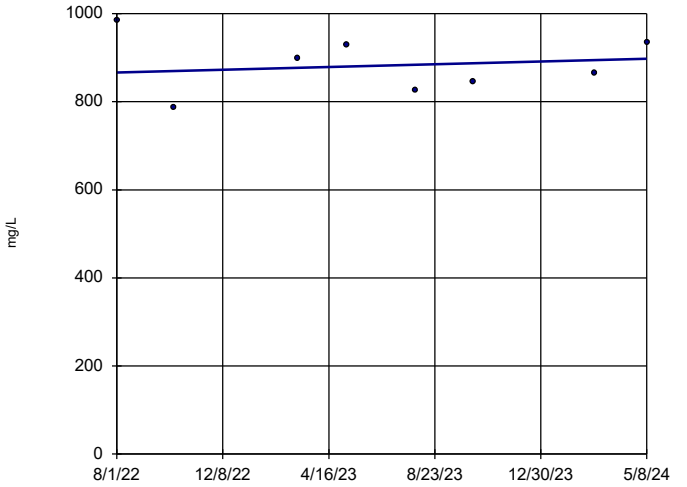
Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

MW-55



n = 8

Slope = 17.92 units per year.

Mann-Kendall statistic = 2 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

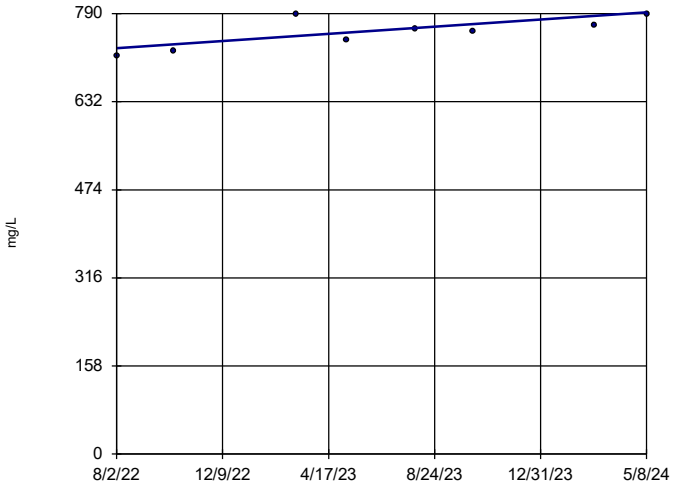
Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sanitas™ v.10.0.16 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

OW-57ROUT



n = 8

Slope = 36.37 units per year.

Mann-Kendall statistic = 17 critical = 17

Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/3/2024 10:52 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Appendix D
Assessment Monitoring and GSI Statistical Evaluation

1540 Eisenhower Pl.
Ann Arbor, MI 48108

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TRCcompanies.com

Technical Memorandum

Date:	July 30, 2024
To:	J.R. Register, Consumers Energy
From:	Kristin Lowery, TRC Rebecca Paalanen, TRC
Project No.:	553828.0000 Phase 002, Task 002
Subject:	Assessment Monitoring and GSI Statistical Evaluation of the Second Quarter 2024 Sampling Event JC Weadock Landfill, Consumers Energy Company, Essexville, Michigan

During the statistical evaluation of the initial assessment monitoring event (May 2018) for the JC Weadock Power Plant Landfill, arsenic was present in one or more downgradient monitoring wells at statistically significant levels exceeding the Groundwater Protection Standards (GWPSs). Therefore, Consumers Energy Company (Consumers Energy) initiated an Assessment of Corrective Measures (ACM) within 90 days from when the Appendix IV exceedance was determined. The ACM was completed on September 11, 2019.

Currently, Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule[1] at the JC Weadock Power Plant Landfill and quarterly groundwater monitoring in accordance with the February 2021 Weadock Landfill Hydrogeological Monitoring Plan (HMP). The second quarter 2024 monitoring event was conducted on May 7-8, 2024. In accordance with §257.95 and the HMP, the assessment monitoring data must be compared to GWPSs to determine whether or not Appendix III and Appendix IV constituents, and additional Michigan Part 115 (as amended by PA 640) Section 11511a(3) and Section 11519b(2) constituents, are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h) and Part 115, as detailed in the April 23, 2021 Groundwater Protection Standards technical memorandum, which was also included in the First Quarter 2021 Hydrogeological Monitoring Report[2]. In accordance with the HMP, groundwater monitoring data from the designated groundwater-surface water (GSI) monitoring wells must be also compared to the GSI criteria to determine whether or not the GSI monitoring constituents are detected at statistically significant levels above the GSI criteria.

The evaluation of the initial semiannual assessment monitoring event data (April and May 2018) indicated that arsenic was present at statistically significant levels above the GWPS at one of the three former downgradient wells. The three downgradient wells were located within a vent (e.g., opening) of the perimeter soil/bentonite slurry wall to assess the quality of groundwater passing the waste

[1] USEPA final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) published April 17, 2015, as amended per Phase One, Part One of the CCR Rule (83 FR 36435).

[2] TRC. 2021. *First Quarter 2021 Hydrogeological Monitoring Report – JC Weadock Solid Waste Disposal Area, Essexville, Michigan.* Prepared for Consumers Energy Company. April.

boundary. As discussed in detail in the HMP, in July 2018, the vent in the perimeter soil/bentonite slurry wall was closed and the slurry wall is now continuous along the entire perimeter of the Weadock Landfill. As a result, the groundwater monitoring system was revised, as documented in the HMP. The monitoring well network now consists of twelve (12) downgradient monitoring wells and eight (8) GSI monitoring wells.

The statistical evaluation of the second quarter 2024 assessment monitoring event data indicates that the following constituents are present at statistically significant levels above the GWPSs in downgradient monitoring wells at the Weadock Landfill:

Constituent	GWPS	#Downgradient Wells Exceeded
Boron	560 µg/L	10 of 12
Calcium	280 mg/L	1 of 12
Sulfate	780 mg/L	1 of 12

Corrective action has been triggered as a result of data collected during the initial assessment monitoring event. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97 and execute the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

The statistical evaluation found that no constituents were present at statistically significant levels exceeding the site-specific GSI criteria.

Statistical Evaluation Procedures

Following each quarterly sampling event, compliance well data for the Weadock Landfill are evaluated in accordance with the Assessment Monitoring Statistical Data Evaluation and GSI Data Evaluation procedures in the HMP. The assessment monitoring and GSI monitoring programs were developed to evaluate concentrations of constituents present in the uppermost aquifer relative to acceptable levels (i.e., GWPSs or GSI criteria). To evaluate whether or not a criterion exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given monitoring event compared to the applicable criterion must be large enough, after accounting for variability in the sample data, that the result is unlikely to have occurred merely by chance. Consistent with the Unified Guidance [3], the preferred method for comparisons to a fixed standard is confidence limits. Based on the number of historical observations in the representative sample population, the sample mean, the sample standard deviation, and a selected confidence level (i.e., 99 percent), an upper and lower confidence limit is calculated. The true concentration, with 99 percent confidence, will fall between the lower and upper confidence limits.

The concentrations observed in the downgradient wells are deemed to be a statistically significant exceedance when the 99 percent lower confidence limit of the downgradient data exceeds the criterion. If the confidence interval straddles the criterion (i.e., the lower confidence level is below the criterion, but the upper confidence level is above), the statistical test result indicates that there is insufficient confidence that the measured concentrations are different from the criterion and thus no compelling

[3] USEPA. 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Conservation and Recovery. EPA 530/R-09-007.

evidence that the measured concentration is a result of a release from the CCR unit versus the inherent variability of the sample data. This statistical approach is consistent with the statistical methods for assessment monitoring presented in §257.93(f) and (g). Statistical evaluation methodologies built into the CCR Rule and Part 115 and numerous other federal rules are key in determining whether or not individually measured data points represent a concentration increase over the baseline or a fixed standard (such as a GWPS in an assessment monitoring program).

For each detected constituent, the concentrations for each well were first compared directly to the GWPS, as shown on Table 1, or the GSI criteria, as shown on Table 2. Parameter-well combinations that included a direct exceedance of the criteria within the most recent two years of sampling events (eight quarterly sampling events, August 2022 through May 2024) were retained for further analysis.

Groundwater data were evaluated utilizing Sanitas™ statistical software. Sanitas™ is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas™ statistical program, confidence limits were used to perform the statistical comparison of compliance data to a fixed standard. Parametric and non-parametric confidence intervals were calculated for each parameter with a direct exceedance using a per test[4] 99 percent confidence level, i.e., a significance level (α) of 0.01. The following narrative describes the methods employed, the results obtained and the Sanitas™ output files are included as an attachment.

The statistical data evaluation included the following steps:

- Review of data quality checklists for the data sets;
- Graphical representation of the monitoring data as time versus concentration by well/constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of visual trends apparent in the graphical representations for statistical significance;
- Evaluation of percentage of non-detects for each well-constituent pair;
- Distribution of the data; and
- Calculation of the confidence intervals for each cumulative dataset.

The results of these evaluations are presented and discussed below.

Data from each round were evaluated for completeness, overall quality, and usability and were deemed appropriate for the purposes of the assessment and GSI monitoring programs. Initially, the results were observed visually for potential outliers. No outliers were identified in the data set.

The Sanitas™ software was then used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent eight sampling events. The tests were run with a per-test significance of $\alpha = 0.01$. Non-detect data was handled in accordance with the HMP for the purposes of calculating the confidence intervals.

[4] Confidence level is assessed for each individual comparison (i.e., per well and per constituent).

The Sanitas™ software generates an output that includes graphs of the parametric or non-parametric confidence intervals for each well along with notes data transformations, as appropriate.

Assessment Monitoring Statistical Evaluation

The assessment monitoring statistical evaluation is performed on the downgradient monitoring wells in accordance with the HMP. The downgradient monitoring wells include:

- JCW-MW-18001
- JCW-MW-18004
- JCW-MW-18005
- JCW-MW-18006
- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- OW-57R Out

The concentrations from each well were first compared directly to the GWPS, as shown on Table 1. Constituent-well combinations that included a direct exceedance of the GWPS within the past eight monitoring events were retained for further analysis (Attachment 1). Direct comparison GWPS exceedances include the following constituent well combinations:

- Boron in MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, MW-55, OW-57R OUT, JCW-MW-18001, JCW-MW-18005, and JCW-MW-18006;
- Calcium in JCW-MW-18001 and JCW-MW-18005;
- Sulfate in JCW-MW-18001;
- Arsenic in MW-55 and JCW-MW-18006; and
- Molybdenum in MW-55.

The purpose of assessment monitoring is to assess whether constituent concentrations in groundwater from prior operations are above a risk-based standard (i.e. GWPS). As detailed in the *Alternate Source Demonstration* (TRC, December 2019), the arsenic and molybdenum concentrations at MW-55 are not the result of a release from the unit; therefore, comparison of these concentrations to the GWPS is not appropriate and assessment monitoring confidence intervals were not calculated.

The software outputs for the assessment monitoring data evaluation are included in Attachment 1 along with data reports showing the values used for the evaluation. The percentage of non-detect observations are also included in Attachment 1. Visual trends were apparent in multiple wells for arsenic, boron, calcium, and sulfate. These data sets were tested further in Sanitas™ utilizing Sen's Slope to estimate the average rate of change in concentration over time and utilizing the Mann-Kendall trend test to test for significance of the trend at the 98% confidence level. The trend tests show that the trends for boron at MW-51 and sulfate at JCW-MW-18001 are statistically significant (Attachment 1). The trends are causing the confidence intervals to widen. Calculating a confidence interval around a trending data set incorporates not only variability present naturally in the underlying dataset, but also incorporates variability due to the trend itself. Based on the observed trends, confidence bands were selected as a more appropriate assessment for boron at MW-51 and sulfate at JCW-MW-18001. Confidence bands are selected by the Unified Guidance as the appropriate method for calculating confidence intervals on trending data. A confidence band calculates upper and lower confidence limits at each point along the trend to reduce variability and create a narrower confidence interval.

The Sanitas™ software generates an output that includes graphs of the confidence bands and parametric or non-parametric confidence intervals for each well along with notes on data transformations, as appropriate. The data distributions are as follows:

Distribution	Constituent-Well Combinations
Normal	Boron at JCW-MW-18001, JCW-MW-18006, MW-50, MW-52, MW-53, MW-54R, MW-55, and OW-57R OUT Calcium at JCW-MW-18005 and JCW-MW-18001 Arsenic at JCW-MW-18006
Normalized by power transformation	Boron at MW-53R (4)
Not normal (non-parametric test used)	Boron at JCW-MW-18005
Not Applicable – confidence bands used	Boron at MW-51 Sulfate at JCW-MW-18001

The confidence bands and interval tests compare the lower confidence limit to the GWPS. Arsenic concentrations at JCW-MW-18006 were previously considered statistically significant; however, the lower confidence limit has been at or below the GWPS since the second quarter 2021. Calcium concentrations at MW-51 were previously considered statistically significant; however, calcium concentrations are generally decreasing, the lower confidence limit has been below the GWPS since the first quarter 2022, and concentrations have been below the GWPS by direct comparison since first quarter 2022. Concentration trends will continue to be monitored. Statistically significant exceedances of the GWPS were noted for boron at JCW-MW-18001, JCW-MW-18005, JCW-MW-18006, MW-50, MW-52, MW-53, MW-53R, MW-54R, MW-55, and OW-57R OUT, calcium at JCW-MW-18001, and sulfate at JCW-MW-18001. Boron concentrations have been consistently above the GWPS since monitoring under the Weadock Landfill HMP began in first quarter 2021. Calcium at JCW-MW-18001 was a confirmed GWPS exceedance in first quarter 2023 resulting from increases in calcium concentration from first quarter 2021 through first quarter 2024. No trend in calcium concentrations was observed at JCW-MW-18001 as of second quarter 2024. Sulfate at JCW-MW-18001 was a confirmed GWPS exceedance in second quarter 2023 resulting from increases in sulfate concentrations. As noted in the Alternate Source Demonstration (Second Quarter 2023 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2024), multiple lines of evidence indicate that the increase in sulfate concentration is not a result of a change in flux from the landfill and is instead the result of changing groundwater conditions outside the slurry wall. Corrective action has been triggered for the site as a result of data collected during the initial May 2018 assessment monitoring event. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97 and will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

GSI Statistical Evaluation

Eight monitoring wells located along the surface water features adjacent to the Weadock Landfill are included in the GSI monitoring program to meet the requirements of Part 31:

- MW-50
- MW-51
- MW-52
- MW-53
- MW-53R
- MW-54R
- MW-55
- JCW-MW-18004

The concentrations from each well were first compared directly to the GSI criteria, as shown on Table 2. Constituent-well combinations that included a direct exceedance of the GSI criteria within the past eight monitoring events were retained for further analysis (Attachment 2). Direct comparison GSI criteria exceedances include the following constituent well combinations:

- Arsenic in MW-55

The purpose of the GSI statistical evaluation is to assess compliance with the GSI pathway. Although the *Alternate Source Demonstration* supports that the arsenic concentrations at MW-55 are not the result of a release from the unit, these concentrations still affect compliance with the GSI pathway. Therefore, it is appropriate to calculate confidence limits for arsenic at MW-55 for comparison to the GSI criteria.

The software outputs for the assessment monitoring data evaluation are included in Attachment 2 along with data reports showing the values used for the evaluation. The percentage of non-detect observations are also included in Attachment 2.

The Sanitas™ software generates an output that includes graphs of the parametric or non-parametric confidence intervals for each well along with notes on data transformations, as appropriate. The data distributions are as follows:

Distribution	Constituent-Well Combinations
Normal	Arsenic at MW-55

The confidence interval tests compare the lower confidence limit to the GSI. The statistical evaluation found that no constituents were present at statistically significant levels exceeding the site-specific GSI criteria. Arsenic concentrations at MW-55 were previously considered statistically significant; however, the arsenic concentrations decreased in 2022 and 2023. The lower confidence limits for arsenic continued to be below the GWPS in second quarter 2024.

Attachments

Table 1 Comparison of Groundwater Sampling Results to Groundwater Protection Standards
Table 2 Comparison of Groundwater Sampling Results to GSI

Attachment 1 Assessment Monitoring Sanitas™ Output Files
Attachment 2 GSI Evaluation Sanitas™ Output Files

Tables

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-50															
		Sample Date:	8/1/2022	8/1/2022	10/10/2022	10/10/2022	3/8/2023	3/8/2023	5/8/2023	5/8/2023	7/26/2023	7/26/2023	10/9/2023	10/9/2023	3/5/2024	3/5/2024	5/7/2024	5/7/2024
Constituent	Unit	GWPS																
Appendix III[1]				Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	**560**	**1,290**	**1,290**	**1,730**	**1,670**	**2,020**	**2,080**	**1,720**	**1,720**	**1,720**	**1,690**	**2,070**	**2,060**	**2,170**	**2,140**	**2,070**	**2,020**
Calcium	mg/L	**280**	161	164	186	181	152	--	142	144	188	187	205	206	199	196	184	191
Chloride	mg/L	2,300	54.2	54.9	47.7	47.6	35.9	36.7	31.5	31.9	37.4	39.1	37.6	37	40.1	38.6	37.1	38.1
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	324	325	376	376	341	315	314	316	392	385	470	472	449	448	425	421
Total Dissolved Solids	mg/L	4,700	1,080	1,040	1,120	1,150	939	984	878	880	1,100	1,110	1,170	1,190	1,180	1,190	1,250	1,160
pH, Field	SU	6.5 - 8.5	7.0	--	7.3	--	7.3	--	7.4	--	7.4	--	7.0	--	7.5	--	7.5	--
Appendix IV[1]																		
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	2	2	3	3	2	2	2	2	3	3	3	3	3	3	3	3
Barium	ug/L	2,000	90	94	106	108	89	92	114	87	114	113	135	136	187	179	176	180
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	64	61	62	62	65	65	55	54	58	59	59	59	69	68	61	62
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	6	6	6	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6	5	5
Radium-226	pCi/L	NA	--	--	0.158	0.343	--	--	0.155	0.144	--	--	0.291	0.320	--	--	0.27	0.349
Radium-228	pCi/L	NA	--	--	1.14	1.37	--	--	0.686	< 0.606	--	--	1.15	1.46	--	--	1.47	1.38
Radium-226/228	pCi/L	5.0	--	--	1.30	1.72	--	--	0.841	0.633	--	--	1.44	1.78	--	--	1.2	1.03
Selenium	ug/L	50	2	2	2	2	1	1	1	2	1	1	< 1	2	3	3	1	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]																		
Iron	ug/L	28,000	1,830	1,850	2,460	2,340	604	601	755	756	1,960	1,900	2,300	2,340	889	930	834	817
Copper	ug/L	1,000	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	2	2	1	1	1	1	2	2
Nickel	ug/L	100	6	7	4	7	< 2	< 2	3	< 2	2	< 2	< 2	2	8	8	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-51							
		Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/26/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,270**	**1,490**	**1,320**	**1,230**	**1,180**	**1,170**	**935**	**798**
Calcium	mg/L	**280**	211	211	169	166	162	132	132	128
Chloride	mg/L	2,300	102	101	98.4	99.9	97	91.6	78.3	79.9
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	404	394	360	356	308	267	266	262
Total Dissolved Solids	mg/L	4,700	1,450	1,380	1,180	1,240	1,100	952	902	958
pH, Field	SU	6.5 - 8.5	7.0	7.2	7.2	7.3	7.4	7.2	7.4	7.4
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	15	18	10	8	10	18	10	13
Barium	ug/L	2,000	169	188	178	180	141	141	127	117
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	2	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	53	50	46	40	40	34	31	28
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	< 0.397	--	0.143	--	0.285	--	0.181
Radium-228	pCi/L	NA	--	2.19	--	1.01	--	1.23	--	0.863
Radium-226/228	pCi/L	5.0	--	2.51	--	1.15	--	1.52	--	0.681
Selenium	ug/L	50	2	1	2	1	< 1	< 1	1	< 1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	1,860	2,880	514	450	1,290	1,660	446	760
Copper	ug/L	1,000	< 1	1	< 1	1	3	2	1	1
Nickel	ug/L	100	6	4	< 2	3	4	< 2	< 2	3
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	2	2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-52							
		Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,070**	**1,330**	**1,040**	**993**	**1,030**	**1,140**	**945**	**895**
Calcium	mg/L	**280**	222	224	228	217	247	234	237	236
Chloride	mg/L	2,300	45.1	40.4	36.3	32.4	31.5	30.2	33.8	33.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	663	603	581	581	569	572	540	550
Total Dissolved Solids	mg/L	4,700	1,580	1,670	1,430	1,430	1,520	1,440	1,380	1,430
pH, Field	SU	6.5 - 8.5	6.7	6.9	6.8	6.9	6.6	6.8	7.0	7.0
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	118	122	102	95	99	108	94	91
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	29	26	27	23	27	27	27	29
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	0.205	--	< 0.128	--	0.444	--	0.162
Radium-228	pCi/L	NA	--	< 0.694	--	< 0.594	--	1.64	--	1.19
Radium-226/228	pCi/L	5.0	--	0.805	--	< 0.594	--	2.08	--	1.03
Selenium	ug/L	50	2	2	1	< 1	< 1	< 1	2	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	5,020	6,340	2,820	2,720	6,720	7,560	3,120	3,680
Copper	ug/L	1,000	2	2	1	1	2	1	2	2
Nickel	ug/L	100	5	3	< 2	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-53							
		Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	GWPS								
Appendix III[(1)]										
Boron	ug/L	**560**	**4,300**	**4,140**	**2,150**	**2,620**	**4,370**	**5,530**	**5,740**	**6,110**
Calcium	mg/L	**280**	116	108	82.5	104	146	136	134	134
Chloride	mg/L	2,300	66.5	53	24.8	56.5	80.3	77.4	77.4	89.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	119	126	93.6	50.8	7.39	2.28	25.4	1.53
Total Dissolved Solids	mg/L	4,700	820	740	489	613	792	722	694	942
pH, Field	SU	6.5 - 8.5	7.1	7.3	7.3	7.4	7.1	7.3	7.5	7.5
Appendix IV[(1)]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	1	2	< 1	< 1	1	1	1	1
Barium	ug/L	2,000	313	285	202	272	692	719	654	582
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	42	38	33	34	44	42	50	50
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	7	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	0.269	--	0.198	--	0.679	--	0.561
Radium-228	pCi/L	NA	--	1.15	--	< 0.518	--	1.72	--	1.81
Radium-226/228	pCi/L	5.0	--	1.42	--	0.700	--	2.40	--	1.25
Selenium	ug/L	50	3	1	1	2	2	2	3	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[(2)]										
Iron	ug/L	28,000	1,240	1,140	403	569	1,390	1,080	947	665
Copper	ug/L	1,000	< 1	< 1	< 1	< 1	< 1	< 1	1	2
Nickel	ug/L	100	4	2	< 2	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-53R							
		Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,560**	**2,340**	**2,330**	**2,140**	**2,190**	**2,420**	**2,300**	**2,200**
Calcium	mg/L	**280**	219	203	195	202	220	206	173	166
Chloride	mg/L	2,300	50.4	39.2	27.2	30	34.6	35.5	34.7	32.5
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	533	250	101	185	217	221	53.2	47.6
Total Dissolved Solids	mg/L	4,700	1,530	1,160	960	1,060	1,150	1,090	862	880
pH, Field	SU	6.5 - 8.5	6.7	6.8	6.7	6.8	6.7	7.0	7.0	7.1
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	17	20	17	14	17	16	9	10
Barium	ug/L	2,000	97	118	179	174	144	110	165	164
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	180	70	63	59	56	62	61	56	53
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	0.239	--	0.275	--	0.174	--	0.155
Radium-228	pCi/L	NA	--	0.967	--	0.490	--	0.968	--	0.674
Radium-226/228	pCi/L	5.0	--	1.21	--	0.765	--	1.14	--	0.567
Selenium	ug/L	50	2	2	1	1	2	1	2	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	1,030	702	1,580	1,410	1,180	834	752	761
Copper	ug/L	1,000	2	1	1	1	1	1	2	1
Nickel	ug/L	100	5	3	< 2	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-54R							
		Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**4,970**	**5,310**	**5,660**	**5,240**	**6,170**	**5,520**	**5,940**	**5,580**
Calcium	mg/L	**280**	158	160	168	163	162	165	170	161
Chloride	mg/L	2,300	43.9	47.4	49.6	46.5	48.5	45	61.7	56.9
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	72.1	70.9	62	67.2	73.8	67.4	48.6	51.3
Total Dissolved Solids	mg/L	4,700	800	799	770	759	761	756	752	792
pH, Field	SU	6.5 - 8.5	6.9	6.9	6.8	6.9	6.8	7.0	7.0	7.2
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	2	2	1	< 1	< 1	1	1	1
Barium	ug/L	2,000	109	123	126	98	106	113	97	83
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	74	74	71	65	75	70	76	73
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	10	12	15	13	15	17	15	18
Radium-226	pCi/L	NA	--	0.208	--	< 0.141	--	0.160	--	0.18
Radium-228	pCi/L	NA	--	1.31	--	< 0.836	--	1.38	--	0.829
Radium-226/228	pCi/L	5.0	--	1.52	--	< 0.836	--	1.54	--	0.829
Selenium	ug/L	50	1	2	1	1	1	1	3	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	367	1,090	262	74	111	829	159	87
Copper	ug/L	1,000	1	1	2	1	6	2	2	3
Nickel	ug/L	100	2	< 2	< 2	< 2	< 2	2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	MW-55								
		Sample Date:	8/1/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024	5/8/2024
Constituent	Unit	GWPS									
Appendix III[1]				Field Dup							
Boron	ug/L	**560**	**709**	**687**	**976**	**1,110**	**1,140**	**1,290**	**1,200**	**825**	**729**
Calcium	mg/L	**280**	159	165	141	162	165	150	163	166	161
Chloride	mg/L	2,300	11.8	11.8	12.5	24.2	16.9	18.5	16.7	18.3	17.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	248	245	108	94.6	208	129	156	224	236
Total Dissolved Solids	mg/L	4,700	930	1,040	786	898	929	827	846	866	934
pH, Field	SU	6.5 - 8.5	6.9	--	7.0	6.8	6.9	6.9	7.0	6.9	6.9
Appendix IV[1]											
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	**80**	**78**	**126**	**68**	**44**	**75**	**75**	**46**	**39**
Barium	ug/L	2,000	232	231	223	287	267	240	248	260	235
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	29	28	30	27	24	27	26	26	26
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	**80**	**78**	**91**	50	30	33	56	27	25
Radium-226	pCi/L	NA	--	--	0.365	--	0.276	--	0.406	--	0.137
Radium-228	pCi/L	NA	--	--	0.966	--	< 0.916	--	1.26	--	1.11
Radium-226/228	pCi/L	5.0	--	--	1.33	--	< 0.916	--	1.67	--	0.971
Selenium	ug/L	50	3	4	< 1	3	< 1	1	1	1	4
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]											
Iron	ug/L	28,000	18,000	16,600	22,100	24,800	21,600	21,900	16,800	18,700	14,700
Copper	ug/L	1,000	< 1	1	1	< 1	< 1	< 1	< 1	1	1
Nickel	ug/L	100	6	6	4	4	5	22	3	< 2	6
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
pCi/L - picocuries per liter.
-- - not analyzed.
GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.
Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.
All metals were analyzed as total unless otherwise specified.
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.
(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	OW-57R OUT							
		Sample Date:	8/2/2022	10/11/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/6/2024	5/8/2024
Constituent	Unit	GWPS								
Appendix III[(1)]										
Boron	ug/L	**560**	**1,570**	**1,830**	**1,860**	**1,740**	**1,750**	**1,790**	**1,810**	**1,700**
Calcium	mg/L	**280**	113	114	116	117	124	120	123	119
Chloride	mg/L	2,300	52.0	47.6	59	64.2	53.7	50.6	68.1	72.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,230	1,090
Sulfate	mg/L	**780**	85.0	86.8	79.7	80.5	79	94.8	79.3	77.6
Total Dissolved Solids	mg/L	4,700	714	722	790	743	762	758	770	790
pH, Field	SU	6.5 - 8.5	6.8	6.9	6.9	7.1	6.9	7.0	7.2	7.2
Appendix IV[(1)]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	1	1
Barium	ug/L	2,000	67	75	75	72	72	77	81	75
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	1	< 1	4	< 1	< 1	< 1	2	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,230	1,090
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	23	22	26	23	24	23	28	26
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	7	8	6	6	6	7	6	6
Radium-226	pCi/L	NA	--	0.199	--	0.149	--	< 0.155	--	0.115
Radium-228	pCi/L	NA	--	< 0.711	--	< 0.663	--	0.586	--	0.845
Radium-226/228	pCi/L	5.0	--	0.870	--	< 0.663	--	0.680	--	0.731
Selenium	ug/L	50	1	2	2	2	1	< 1	< 1	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[(2)]										
Iron	ug/L	28,000	37	42	53	78	30	40	44	94
Copper	ug/L	1,000	1	2	1	1	1	2	2	2
Nickel	ug/L	100	17	16	15	15	13	15	12	15
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

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Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18001							
		Sample Date:	8/1/2022	10/10/2022	3/8/2023	5/8/2023	7/26/2023	10/5/2023	3/5/2024	5/7/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**1,470**	**1,790**	**1,440**	**1,380**	**1,470**	**1,620**	**1,420**	**1,330**
Calcium	mg/L	**280**	**389**	**465**	**486**	**496**	**555**	**562**	**557**	**537**
Chloride	mg/L	2,300	64.6	63.6	54.2	51.1	58.9	51.1	44.7	44.5
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	**1,180**	**1,400**	**1,640**	**1,670**	**1,770**	**1,890**	**1,880**	**1,790**
Total Dissolved Solids	mg/L	4,700	2,580	3,020	3,030	1,580	3,530	3,430	3,450	3,370
pH, Field	SU	6.5 - 8.5	6.6	6.8	6.7	6.7	6.8	6.5	6.8	6.8
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	1	< 1	2
Barium	ug/L	2,000	61	66	47	50	49	48	49	46
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	95	97	91	83	102	110	106	102
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	< 0.142	--	< 0.122	--	< 0.139	--	0.124
Radium-228	pCi/L	NA	--	0.852	--	< 0.547	--	0.783	--	0.525
Radium-226/228	pCi/L	5.0	--	0.893	--	< 0.547	--	0.886	--	0.506
Selenium	ug/L	50	3	1	2	2	2	1	2	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	196	818	830	1,180	2,790	3,840	3,570	2,630
Copper	ug/L	1,000	2	3	2	3	2	2	3	4
Nickel	ug/L	100	14	15	< 2	< 2	41	3	14	4
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	2	< 2	3	2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18004							
		Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024	5/8/2024
Constituent	Unit	GWPS								
Appendix III[(1)]										
Boron	ug/L	**560**	313	343	180	227	310	319	192	206
Calcium	mg/L	**280**	215	193	221	265	229	218	238	213
Chloride	mg/L	2,300	12.5	11.4	12.7	16.8	14.2	15.8	16.9	14.3
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	512	428	533	722	478	466	557	484
Total Dissolved Solids	mg/L	4,700	1,290	1,130	1,250	1,530	1,220	1,160	1,250	1,130
pH, Field	SU	6.5 - 8.5	6.7	6.8	6.8	6.8	6.8	7.0	7.0	6.9
Appendix IV[(1)]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	ug/L	2,000	31	37	24	28	30	34	26	26
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	51	46	39	42	50	49	43	43
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	< 0.135	--	< 0.131	--	< 0.155	--	0.102
Radium-228	pCi/L	NA	--	< 0.742	--	< 0.600	--	1.24	--	0.672
Radium-226/228	pCi/L	5.0	--	< 0.742	--	< 0.600	--	1.30	--	0.67
Selenium	ug/L	50	1	1	11	2	2	< 1	4	4
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[(2)]										
Iron	ug/L	28,000	45	< 20	46	67	24	36	98	73
Copper	ug/L	1,000	2	2	1	2	2	2	2	2
Nickel	ug/L	100	2	5	< 2	< 2	< 2	< 2	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18005							
		Sample Date:	8/2/2022	10/11/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/6/2024	5/8/2024
Constituent	Unit	GWPS								
Appendix III[1]										
Boron	ug/L	**560**	**981**	**1,290**	**930**	**992**	**1,170**	**1,470**	**1,000**	**960**
Calcium	mg/L	**280**	165	150	262	258	202	159	**335**	**302**
Chloride	mg/L	2,300	50.9	53.9	25.4	22.3	44.1	48.1	23.3	22.1
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	213	160	435	422	216	154	512	475
Total Dissolved Solids	mg/L	4,700	967	868	1,250	1,190	1,000	884	1,400	1390
pH, Field	SU	6.5 - 8.5	6.7	6.8	6.6	6.8	6.8	6.9	6.7	6.8
Appendix IV[1]										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	4	5	4	2	< 1	1	3	4
Barium	ug/L	2,000	71	80	115	105	76	74	136	127
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	32	32	36	33	33	32	43	41
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	5	6	5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	0.193	--	0.134	--	0.221	--	0.165
Radium-228	pCi/L	NA	--	< 0.800	--	< 0.573	--	1.17	--	1.23
Radium-226/228	pCi/L	5.0	--	< 0.800	--	< 0.573	--	1.39	--	1.07
Selenium	ug/L	50	< 1	2	3	2	2	1	2	< 1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]										
Iron	ug/L	28,000	2,810	3,220	1,720	676	171	948	4,020	6,550
Copper	ug/L	1,000	< 1	< 1	1	< 1	2	1	7	2
Nickel	ug/L	100	9	11	< 2	9	8	9	< 2	< 2
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 1
Comparison of Groundwater Sampling Results to Groundwater Protection Standards
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

		Sample Location:	JCW-MW-18006															
		Sample Date:	8/2/2022	10/11/2022	10/11/2022	3/9/2023	3/9/2023	5/9/2023	5/9/2023	7/31/2023	7/31/2023	10/9/2023	10/9/2023	3/6/2024	3/6/2024	5/8/2024	5/8/2024
Constituent	Unit	GWPS															
Appendix III[1]					Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	**560**	**2,260**	**2,720**	**2,650**	**1,730**	**1,760**	**2,450**	**2,480**	**2,100**	**2,140**	**2,280**	**2,470**	**2,650**	**2,700**	**2,740**	**2,830**
Calcium	mg/L	**280**	109	118	119	121	121	118	120	126	126	117	119	137	136	148	150
Chloride	mg/L	2,300	79.0	74.2	74.7	79.9	82.8	73.6	76.6	73	75.9	72.3	71.1	61.3	64.7	49.2	52
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**780**	14.9	21.6	23.0	32.5	33.9	34.2	36.1	39.4	37.9	46.9	47.6	69.7	71.6	122	129
Total Dissolved Solids	mg/L	4,700	709	720	746	715	753	734	751	765	770	738	748	748	776	864	878
pH, Field	SU	6.5 - 8.5	6.7	6.9	--	6.9	--	7.0	--	6.9	--	7.0	--	7.0	--	7.1	--
Appendix IV[1]																	
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	**21**	21	**25**	**25**	5	5	**23**	**23**	18	19	17	18	**22**	**23**	**29**	**29**
Barium	ug/L	2,000	452	480	499	232	238	464	465	354	346	342	381	445	464	390	387
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	52	52	52	21	23	45	47	36	36	37	39	52	54	59	61
Mercury	ug/L	2.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	**73**	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	--	0.516	0.259	--	--	0.337	< 0.192	--	--	0.506	0.431	--	--	0.218	0.280
Radium-228	pCi/L	NA	--	< 0.609	0.869	--	--	0.746	< 0.816	--	--	0.783	1.39	--	--	0.919	0.528
Radium-226/228	pCi/L	5.0	--	0.999	1.13	--	--	1.08	< 0.816	--	--	1.29	1.82	--	--	0.919	0.528
Selenium	ug/L	50	< 1	1	1	2	2	1	2	2	2	< 1	1	3	3	< 1	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters[2]																	
Iron	ug/L	28,000	7,670	7,620	7,630	2,930	2,910	6,890	7,210	6,910	6,860	5,660	5,930	7,970	7,890	10,400	10,800
Copper	ug/L	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	2	2	1	1
Nickel	ug/L	100	5	5	6	< 2	< 2	4	< 2	< 2	< 2	< 2	3	5	9	6	6
Silver	ug/L	34	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	3	3	4	< 2	2	2	3	3	3	2	2	4	4	3	3
Zinc	ug/L	2,400	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

-- - not analyzed.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL, applicable Michigan Part 201 criteria, and UTL as established in TRC's Technical Memorandum dated April 23, 2021.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules and the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

						Sample Location:	MW-50														
						Sample Date:	8/1/2022	8/1/2022	10/10/2022	10/10/2022	3/8/2023	3/8/2023	5/8/2023	5/8/2023	7/26/2023	7/26/2023	10/9/2023	10/9/2023	3/5/2024	3/5/2024	5/7/2024	5/7/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**																
Appendix III[(1)]								Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup	Field Dup
Boron	ug/L	4,000	44,000	69,000	44,000		1,290	1,290	1,730	1,670	2,020	2,080	1,720	1,720	1,720	1,690	2,070	2,060	2,170	2,140	2,070	2,020
Sulfate	mg/L	1,200[F]	NC	NC	1,200		324	325	376	376	341	315	314	316	392	385	470	472	449	448	425	421
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0		7.0	--	7.3	--	7.3	--	7.4	--	7.4	--	7.0	--	7.5	--	7.5	--
Appendix IV[(1)]																					
Arsenic	ug/L	10	100	680	**100**		2	2	3	3	2	2	2	2	3	3	3	3	3	3	3	3
Chromium	ug/L	11[H]	NC	NC	11		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	< 1	< 1
Lithium	ug/L	440	NC	NC	440		64	61	62	62	65	65	55	54	58	59	59	59	69	68	61	62
Molybdenum	ug/L	120	NC	NC	120		6	6	6	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6	5	5
Selenium	ug/L	5.0	55	120	55		2	2	2	2	1	1	1	2	1	1	< 1	2	3	3	1	2
MI Part 115 Parameters[(2)]																					
Iron	ug/L	500,000[EE]	NC	NC	500,000		1,830	1,850	2,460	2,340	604	601	755	756	1,960	1,900	2,300	2,340	889	930	834	817
Vanadium	ug/L	27	NC	NC	27		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-51							
					Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/26/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III(1)													
Boron	ug/L	4,000	44,000	69,000	44,000	1,270	1,490	1,320	1,230	1,180	1,170	935	798
Sulfate	mg/L	1,200[F]	NC	NC	1,200	404	394	360	356	308	267	266	262
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.0	7.2	7.2	7.3	7.4	7.2	7.4	7.4
Appendix IV(1)													
Arsenic	ug/L	10	100	680	**100**	15	18	10	8	10	18	10	13
Chromium	ug/L	11[H]	NC	NC	11	< 1	< 1	< 1	< 1	2	< 1	1	< 1
Lithium	ug/L	440	NC	NC	440	53	50	46	40	40	34	31	28
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55	2	1	2	1	< 1	< 1	1	< 1
MI Part 115 Parameters(2)													
Iron	ug/L	500,000[EE]	NC	NC	500,000	1,860	2,880	514	450	1,290	1,660	446	760
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	2	2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

						Sample Location:	MW-52						
						Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**									
Appendix III(1)														
Boron	ug/L	4,000	44,000	69,000	44,000		1,070	1,330	1,040	993	1,030	1,140	945	895
Sulfate	mg/L	1,200[F]	NC	NC	1,200		663	603	581	581	569	572	540	550
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0		6.7	6.9	6.8	6.9	6.6	6.8	7.0	7.0
Appendix IV(1)														
Arsenic	ug/L	10	100	680	**100**		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium	ug/L	11[H]	NC	NC	11		< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Lithium	ug/L	440	NC	NC	440		29	26	27	23	27	27	27	29
Molybdenum	ug/L	120	NC	NC	120		< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55		2	2	1	< 1	< 1	< 1	2	1
MI Part 115 Parameters(2)														
Iron	ug/L	500,000[EE]	NC	NC	500,000		5,020	6,340	2,820	2,720	6,720	7,560	3,120	3,680
Vanadium	ug/L	27	NC	NC	27		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

						Sample Location:	MW-53						
						Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**									
Appendix III[(1)]														
Boron	ug/L	4,000	44,000	69,000	44,000		4,300	4,140	2,150	2,620	4,370	5,530	5,740	6,110
Sulfate	mg/L	1,200[F]	NC	NC	1,200		119	126	93.6	50.8	7.39	2.28	25.4	1.53
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0		7.1	7.3	7.3	7.4	7.1	7.3	7.5	7.5
Appendix IV[(1)]														
Arsenic	ug/L	10	100	680	**100**		1	2	< 1	< 1	1	1	1	1
Chromium	ug/L	11[H]	NC	NC	11		< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Lithium	ug/L	440	NC	NC	440		42	38	33	34	44	42	50	50
Molybdenum	ug/L	120	NC	NC	120		< 5	< 5	7	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55		3	1	1	2	2	2	3	2
MI Part 115 Parameters[(2)]														
Iron	ug/L	500,000[EE]	NC	NC	500,000		1,240	1,140	403	569	1,390	1,080	947	665
Vanadium	ug/L	27	NC	NC	27		< 2	< 2	< 2	< 2	< 2	< 2	2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-53R							
					Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/8/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	1,560	2,340	2,330	2,140	2,190	2,420	2,300	2,200
Sulfate	mg/L	1,200[F]	NC	NC	1,200	533	250	101	185	217	221	53.2	47.6
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.7	6.8	6.7	6.8	6.7	7.0	7.0	7.1
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	17	20	17	14	17	16	9	10
Chromium	ug/L	11[H]	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Lithium	ug/L	440	NC	NC	440	70	63	59	56	62	61	56	53
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	<5	< 5	< 5
Selenium	ug/L	5.0	55	120	55	2	2	1	1	2	1	2	1
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	1,030	702	1,580	1,410	1,180	834	752	761
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	MW-54R							
					Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024	5/7/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	4,970	5,310	5,660	5,240	6,170	5,520	5,940	5,580
Sulfate	mg/L	1,200[F]	NC	NC	1,200	72.1	70.9	62	67.2	73.8	67.4	48.6	51.3
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.9	6.9	6.8	6.9	6.8	7.0	7.0	7.2
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	2	2	1	< 1	< 1	1	1	1
Chromium	ug/L	11[H]	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Lithium	ug/L	440	NC	NC	440	74	74	71	65	75	70	76	73
Molybdenum	ug/L	120	NC	NC	120	10	12	15	13	15	17	15	18
Selenium	ug/L	5.0	55	120	55	1	2	1	1	1	1	3	2
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	367	1,090	262	74	111	829	159	87
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

						Sample Location:	MW-55							
						Sample Date:	8/1/2022	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024	5/8/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**										
Appendix III(1)								Field Dup							
Boron	ug/L	4,000	44,000	69,000	44,000		709	687	976	1,110	1,140	1,290	1,200	825	729
Sulfate	mg/L	1,200[F]	NC	NC	1,200		248	245	108	94.6	208	129	156	224	236
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0		6.9	--	7.0	6.8	6.9	6.9	7.0	6.9	6.9
Appendix IV(1)															
Arsenic	ug/L	10	100	680	**100**		80	78	**126**	68	44	75	75	46	39
Chromium	ug/L	11[H]	NC	NC	11		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440		29	28	30	27	24	27	26	26	26
Molybdenum	ug/L	120	NC	NC	120		80	78	91	50	30	33	56	27	25
Selenium	ug/L	5.0	55	120	55		3	4	< 1	3	< 1	1	1	1	4
MI Part 115 Parameters(2)															
Iron	ug/L	500,000[EE]	NC	NC	500,000		18,000	16,600	22,100	24,800	21,600	21,900	16,800	18,700	14,700
Vanadium	ug/L	27	NC	NC	27		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Table 2
Comparison of Groundwater Sampling Results to GSI
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	JCW-MW-18004							
					Sample Date:	8/1/2022	10/10/2022	3/9/2023	5/9/2023	7/31/2023	10/9/2023	3/5/2024	5/8/2024
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III[(1)]													
Boron	ug/L	4,000	44,000	69,000	44,000	313	343	180	227	310	319	192	206
Sulfate	mg/L	1,200[F]	NC	NC	1,200	512	428	533	722	478	466	557	484
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.7	6.8	6.8	6.8	6.8	7.0	7.0	6.9
Appendix IV[(1)]													
Arsenic	ug/L	10	100	680	**100**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium	ug/L	11[H]	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1
Lithium	ug/L	440	NC	NC	440	51	46	39	42	50	49	43	43
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	5.0	55	120	55	1	1	11	2	2	< 1	4	4
MI Part 115 Parameters[(2)]													
Iron	ug/L	500,000[EE]	NC	NC	500,000	45	< 20	46	67	24	36	98	73
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

NC - no criteria.

-- - not analyzed.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}.

* Mixing Zone GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.

** GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.

[F] - Criterion is the Final Acute Value (FAV) .

[H] - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

[EE] - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

Bold value indicates an exceedance of the GSI. Data from downgradient monitoring wells are screened against the GSI for evaluation purposes only. Confidence intervals will be used to determine compliance per the HMP.

All metals were analyzed as total unless otherwise specified.

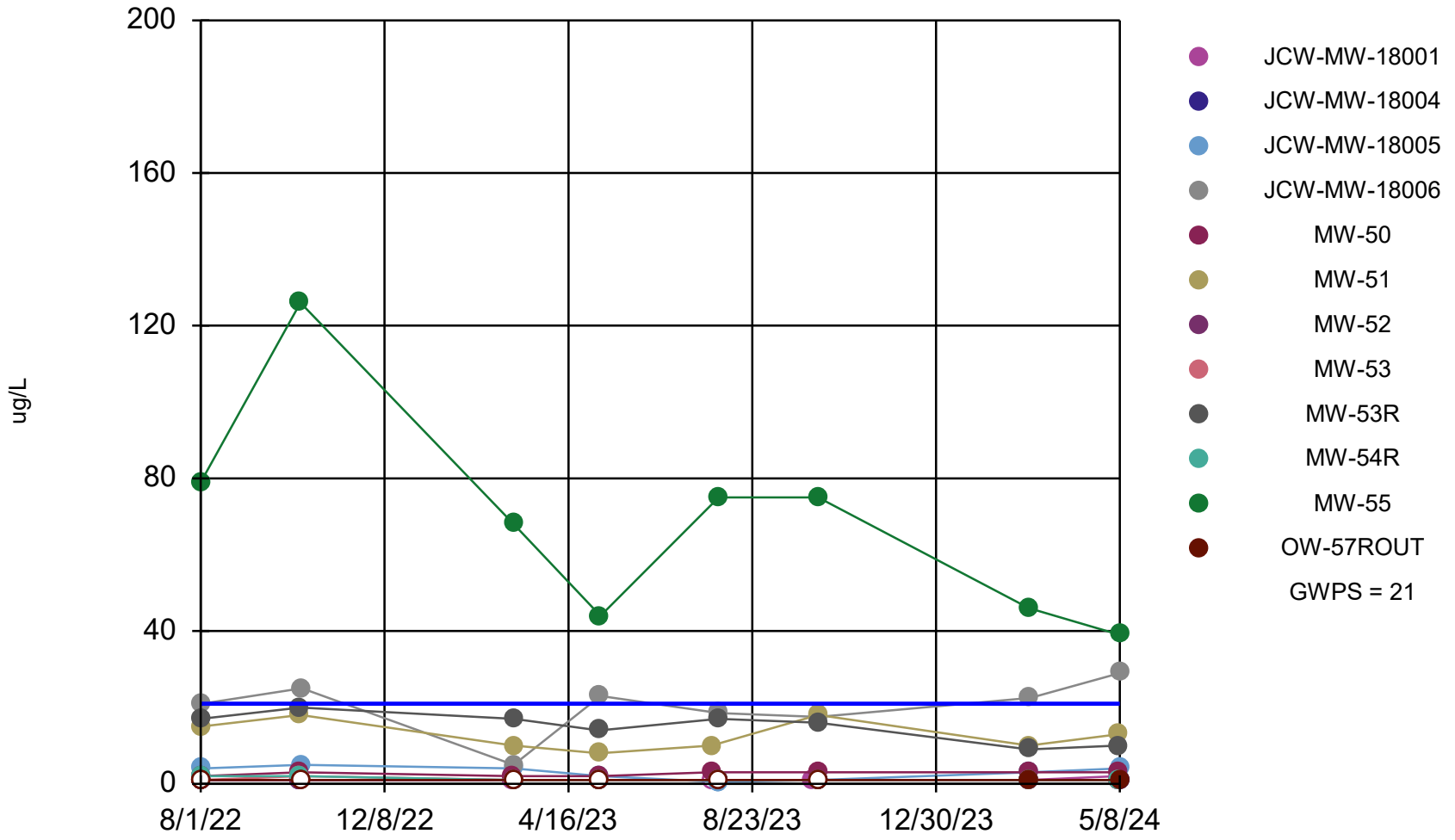
(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

(2) Per Michigan Part 115 Amendments - Public Act No. 640 of 2018 Section 11519b(2) addtional assessment monitoring constituents (vanadium and zinc) are reported.

Attachment 1
Assessment Monitoring Sanitas™ Output Files

Hollow symbols indicate censored values.

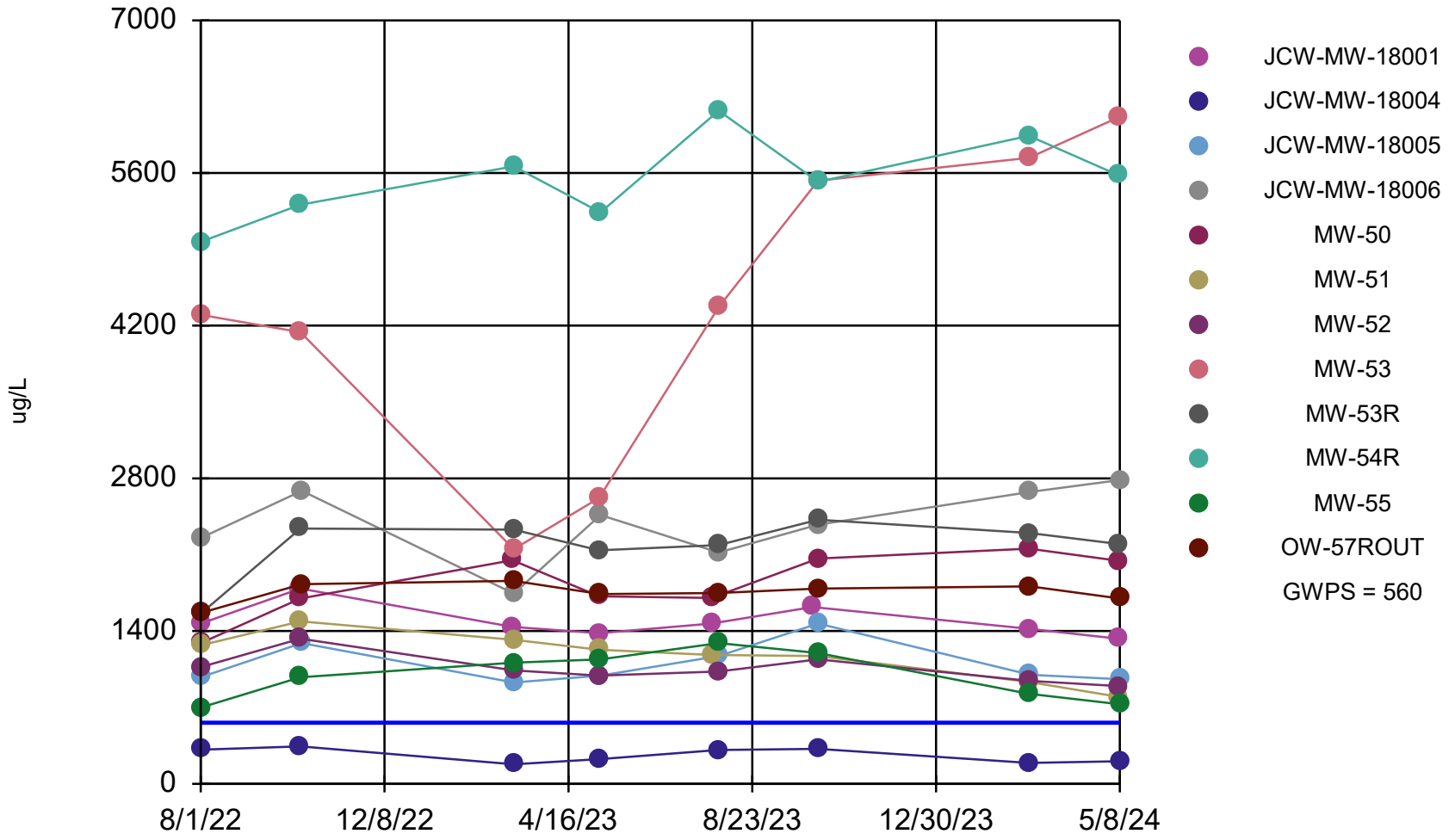
Arsenic Comparison to GWPS



Time Series Analysis Run 6/13/2024 3:14 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

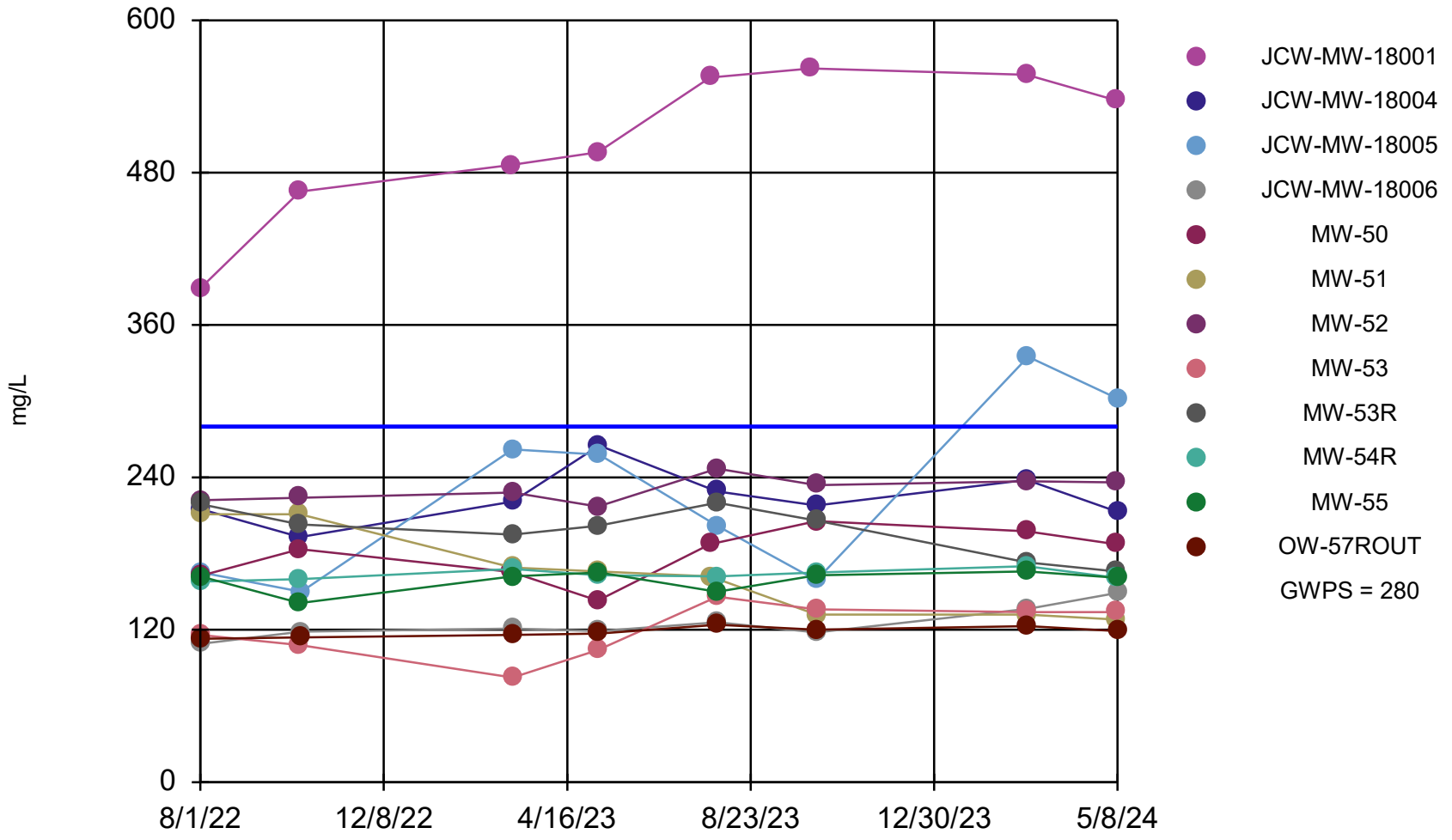
Boron Comparison to GWPS



Time Series Analysis Run 6/13/2024 3:20 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Calcium Comparison to GWPS

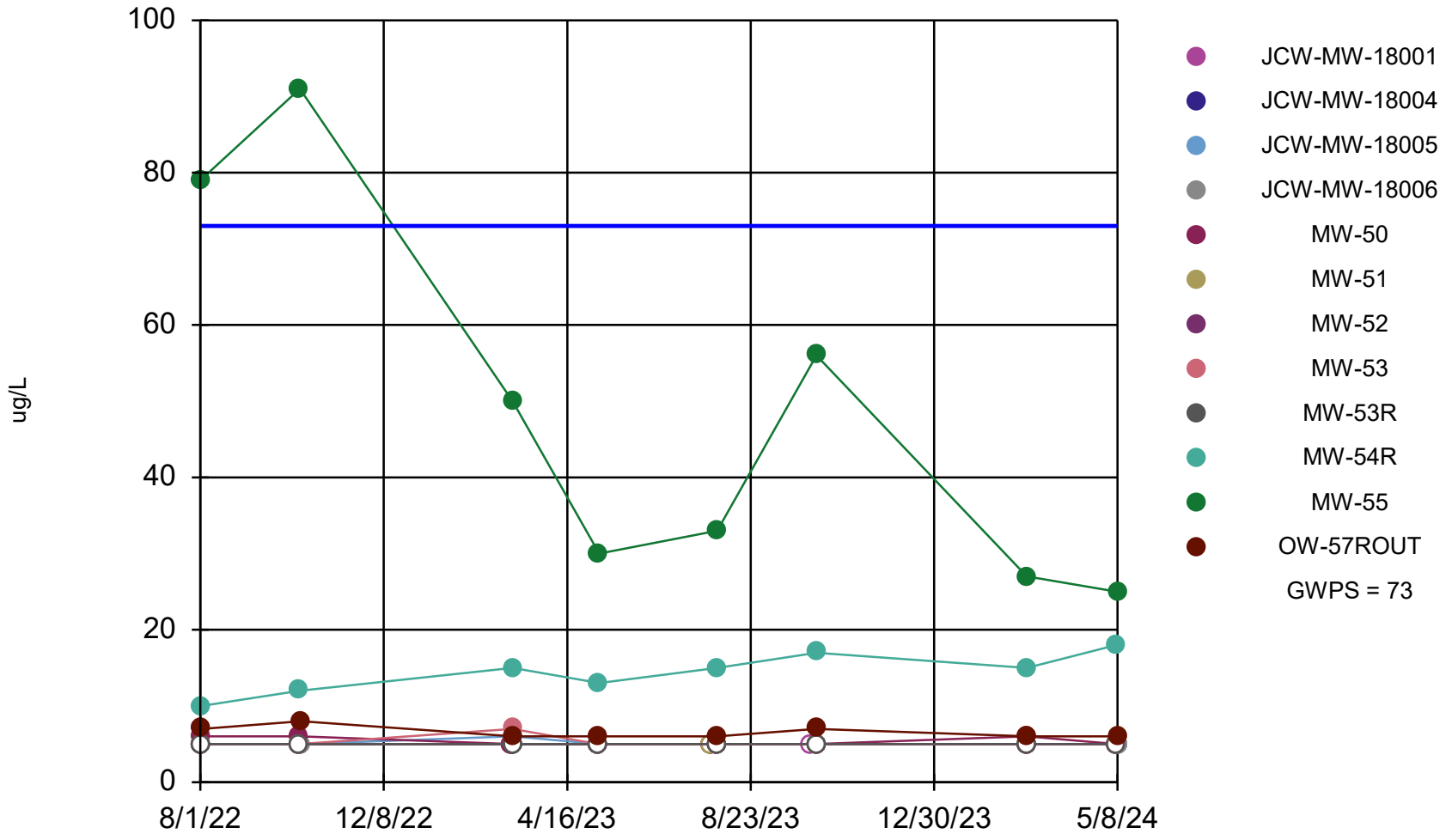


Time Series Analysis Run 6/13/2024 3:22 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Hollow symbols indicate censored values.

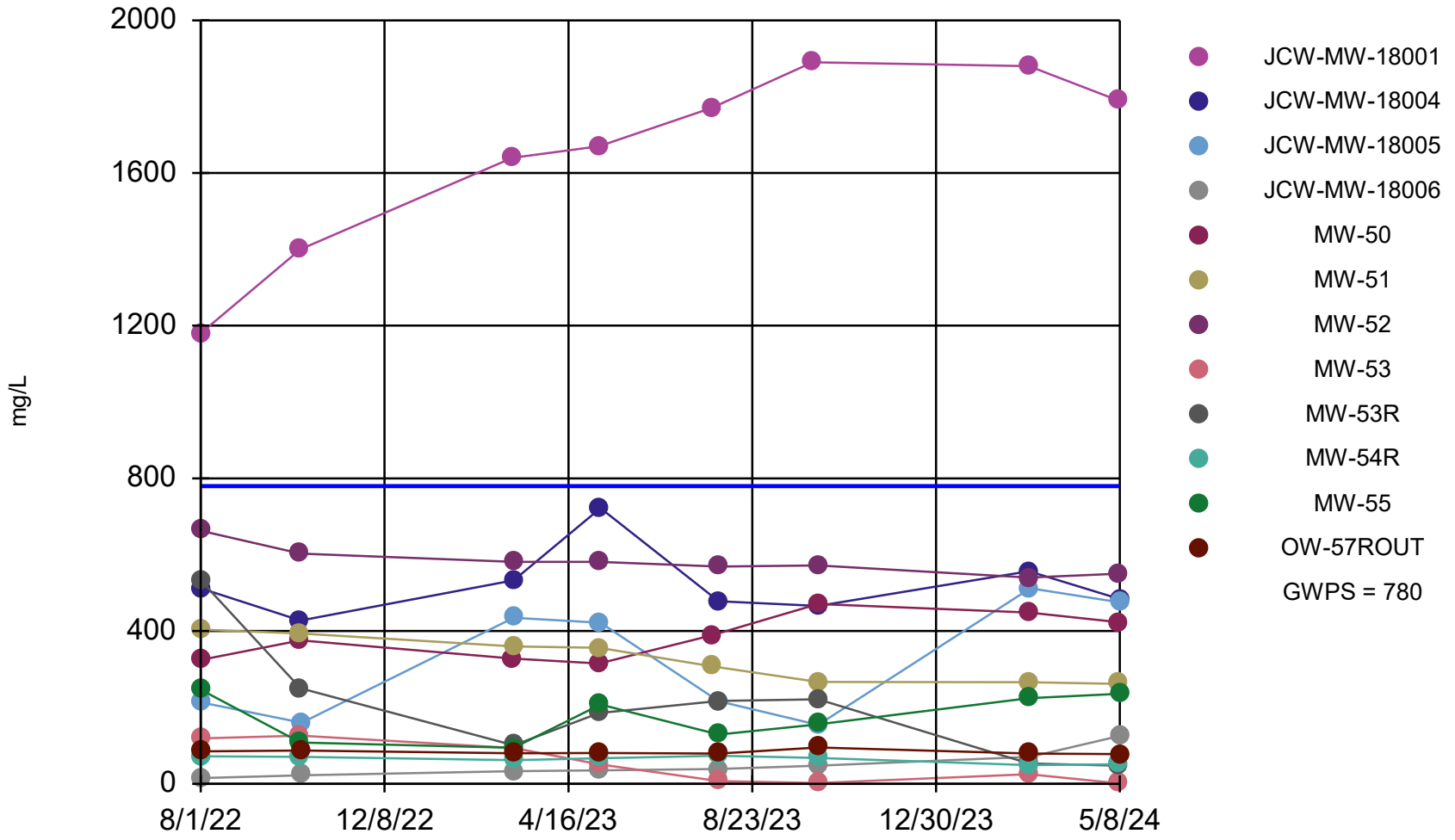
Molybdenum Comparison to GWPS



Time Series Analysis Run 6/13/2024 3:23 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sulfate Comparison to GWPS



Time Series Analysis Run 6/13/2024 3:25 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Summary Report

Constituent: Arsenic, Total Analysis Run 6/13/2024 3:27 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

For observations made between 8/1/2022 and 5/8/2024, a summary of the selected data set:

Observations = 96
NDs = 34%
Wells = 12
Minimum Value = 0.5
Maximum Value = 126
Mean Value = 10.75
Median Value = 2
Standard Deviation = 20.42
Coefficient of Variation = 1.899
Skewness = 3.276

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	75%	1	2	1.125	1	0.3536	0.3143	2.268
JCW-MW-18004	8	100%	1	1	1	1	0	0	NaN
JCW-MW-18005	8	12%	0.5	5	2.938	3.5	1.613	0.5492	-0.3713
JCW-MW-18006	8	0%	5	29	20.19	21.75	7.126	0.353	-1.138
MW-50	8	0%	2	3	2.625	3	0.5175	0.1972	-0.5164
MW-51	8	0%	8	18	12.75	11.5	3.882	0.3045	0.3426
MW-52	8	100%	1	1	1	1	0	0	NaN
MW-53	8	25%	1	2	1.125	1	0.3536	0.3143	2.268
MW-53R	8	0%	9	20	15	16.5	3.78	0.252	-0.5431
MW-54R	8	25%	1	2	1.25	1	0.4629	0.3703	1.155
MW-55	8	0%	39	126	69	71.5	27.97	0.4054	0.9202
OW-57ROUT	8	75%	1	1	1	1	0	0	NaN

Summary Report

Constituent: Boron, Total Analysis Run 6/13/2024 3:27 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

For observations made between 8/1/2022 and 5/8/2024, a summary of the selected data set:

Observations = 96
NDs = 0%
Wells = 12
Minimum Value = 180
Maximum Value = 6170
Mean Value = 2014
Median Value = 1565
Standard Deviation = 1521
Coefficient of Variation = 0.7554
Skewness = 1.473

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0%	1330	1790	1490	1455	147.7	0.09916	1.103
JCW-MW-18004	8	0%	180	343	261.3	268.5	66.22	0.2535	-0.04413
JCW-MW-18005	8	0%	930	1470	1099	996	193.5	0.1761	0.9888
JCW-MW-18006	8	0%	1745	2785	2389	2420	345.6	0.1447	-0.6521
MW-50	8	0%	1290	2155	1841	1883	290.5	0.1578	-0.7165
MW-51	8	0%	798	1490	1174	1205	217.8	0.1855	-0.4613
MW-52	8	0%	895	1330	1055	1035	133.9	0.1269	0.9921
MW-53	8	0%	2150	6110	4370	4335	1429	0.3271	-0.3616
MW-53R	8	0%	1560	2420	2185	2250	269	0.1231	-1.75
MW-54R	8	0%	4970	6170	5549	5550	385.5	0.06948	0.171
MW-55	8	0%	698	1290	996	1043	224.1	0.225	-0.1647
OW-57ROUT	8	0%	1570	1860	1756	1770	91.33	0.052	-0.9887

Summary Report

Constituent: Calcium, Total Analysis Run 6/13/2024 3:27 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

For observations made between 8/1/2022 and 5/8/2024, a summary of the selected data set:

Observations = 96
NDs = 0%
Wells = 12
Minimum Value = 82.5
Maximum Value = 562
Mean Value = 201.3
Median Value = 166
Standard Deviation = 104.5
Coefficient of Variation = 0.5191
Skewness = 2.185

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0%	389	562	505.9	516.5	59.72	0.1181	-0.8706
JCW-MW-18004	8	0%	193	265	224	219.5	21.08	0.0941	0.6474
JCW-MW-18005	8	0%	150	335	229.1	230	70.16	0.3062	0.2253
JCW-MW-18006	8	0%	109	149	124.6	120	12.58	0.1009	0.8902
MW-50	8	0%	143	205.5	179.1	185.5	20.56	0.1148	-0.4901
MW-51	8	0%	128	211	163.9	164	33.37	0.2036	0.4048
MW-52	8	0%	217	247	230.6	231	9.709	0.0421	0.2276
MW-53	8	0%	82.5	146	120.1	125	21.2	0.1766	-0.5137
MW-53R	8	0%	166	220	198	202.5	19.6	0.09897	-0.5644
MW-54R	8	0%	158	170	163.4	162.5	4.069	0.0249	0.4177
MW-55	8	0%	141	166	158.8	162	8.681	0.05468	-1.279
OW-57ROUT	8	0%	113	124	118.3	118	3.991	0.03375	0.164

Summary Report

Constituent: Molybdenum, Total Analysis Run 6/13/2024 3:27 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

For observations made between 8/1/2022 and 5/8/2024, a summary of the selected data set:

Observations = 96
NDs = 66%
Wells = 12
Minimum Value = 5
Maximum Value = 91
Mean Value = 9.625
Median Value = 5
Standard Deviation = 13.96
Coefficient of Variation = 1.451
Skewness = 4.132

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	100%	5	5	5	5	0	0	NaN
JCW-MW-18004	8	100%	5	5	5	5	0	0	NaN
JCW-MW-18005	8	62%	5	6	5.125	5	0.3536	0.06899	2.268
JCW-MW-18006	8	100%	5	5	5	5	0	0	NaN
MW-50	8	50%	5	6	5.375	5	0.5175	0.09629	0.5164
MW-51	8	100%	5	5	5	5	0	0	NaN
MW-52	8	100%	5	5	5	5	0	0	NaN
MW-53	8	87%	5	7	5.25	5	0.7071	0.1347	2.268
MW-53R	8	100%	5	5	5	5	0	0	NaN
MW-54R	8	0%	10	18	14.38	15	2.615	0.1819	-0.2842
MW-55	8	0%	25	91	48.88	41.5	25.05	0.5124	0.6577
OW-57ROUT	8	0%	6	8	6.5	6	0.7559	0.1163	1.061

Summary Report

Constituent: Sulfate Analysis Run 6/13/2024 3:27 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

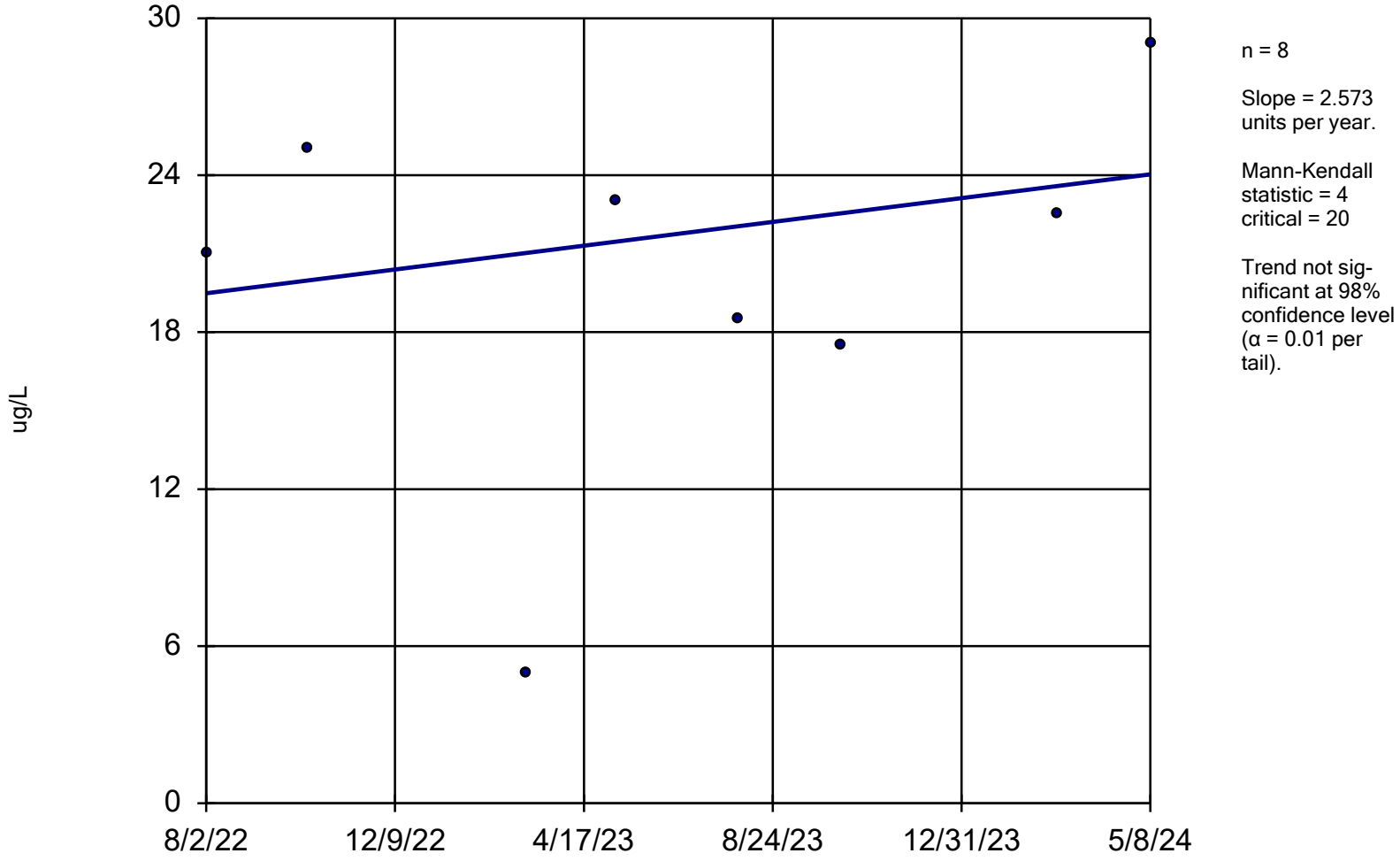
For observations made between 8/1/2022 and 5/8/2024, a summary of the selected data set:

Observations = 96
NDs = 0%
Wells = 12
Minimum Value = 1.53
Maximum Value = 1890
Mean Value = 368.1
Median Value = 230
Standard Deviation = 438.1
Coefficient of Variation = 1.19
Skewness = 2.204

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0%	1180	1890	1653	1720	247.4	0.1497	-0.9301
JCW-MW-18004	8	0%	428	722	522.5	498	90.08	0.1724	1.423
JCW-MW-18005	8	0%	154	512	323.4	319	151.1	0.4673	0.03297
JCW-MW-18006	8	0%	14.9	125.5	48.45	36.9	35.35	0.7296	1.404
MW-50	8	0%	315	471	384.3	382.3	59.49	0.1548	0.1797
MW-51	8	0%	262	404	327.1	332	58.86	0.1799	0.06294
MW-52	8	0%	540	663	582.4	576.5	37.91	0.06509	1.175
MW-53	8	0%	1.53	126	53.25	38.1	52.65	0.9887	0.3623
MW-53R	8	0%	47.6	533	201	201	155.3	0.7729	1.177
MW-54R	8	0%	48.6	73.8	64.16	67.3	9.512	0.1482	-0.7355
MW-55	8	0%	94.6	246.5	175.3	182	60.65	0.3461	-0.1361
OW-57ROUT	8	0%	77.6	94.8	82.84	80.1	5.775	0.06972	1.186

Arsenic, Total

JCW-MW-18006



n = 8

Slope = 2.573 units per year.

Mann-Kendall statistic = 4
critical = 20

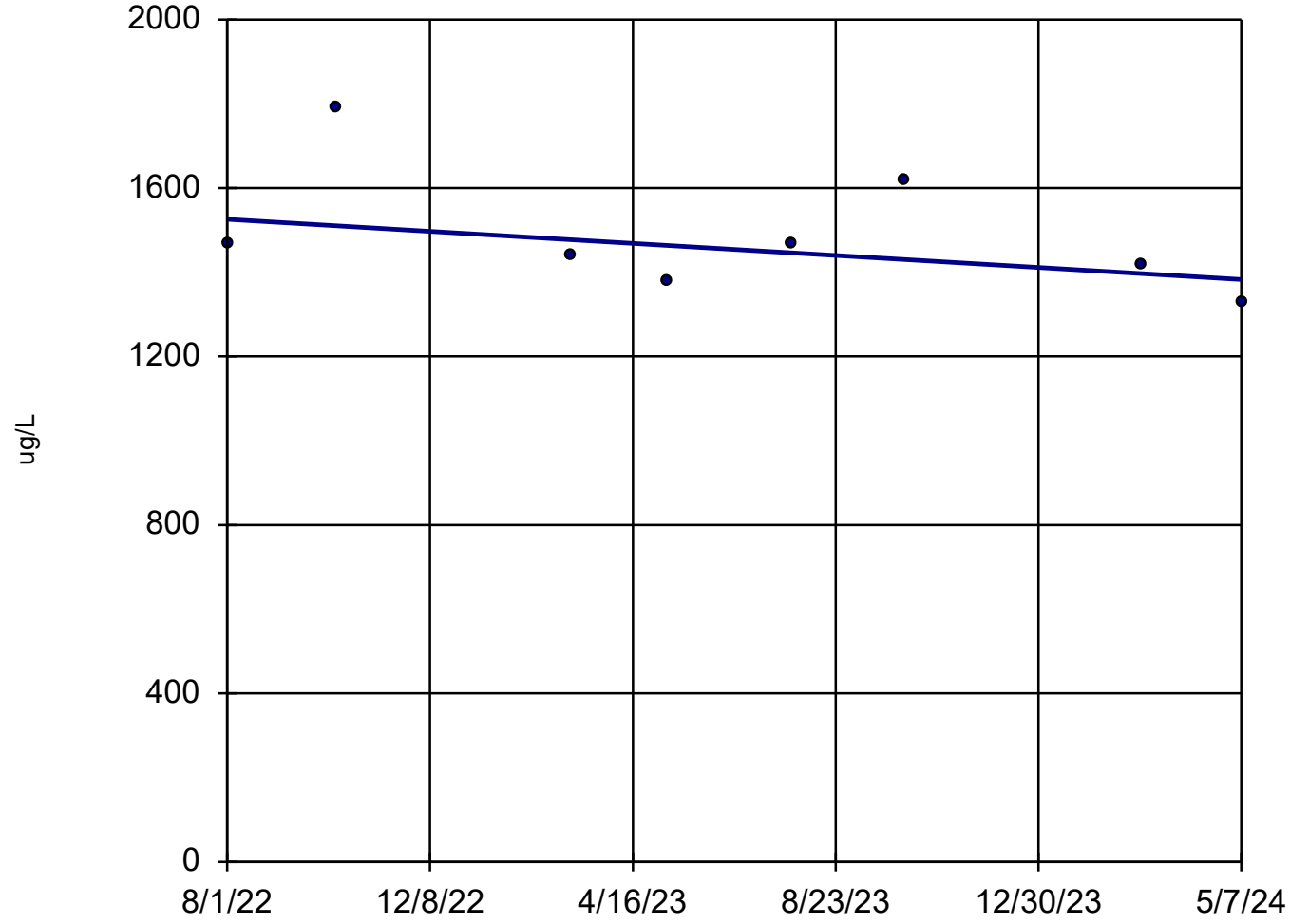
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:40 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

JCW-MW-18001



n = 8

Slope = -80.53 units per year.

Mann-Kendall statistic = -11
critical = -20

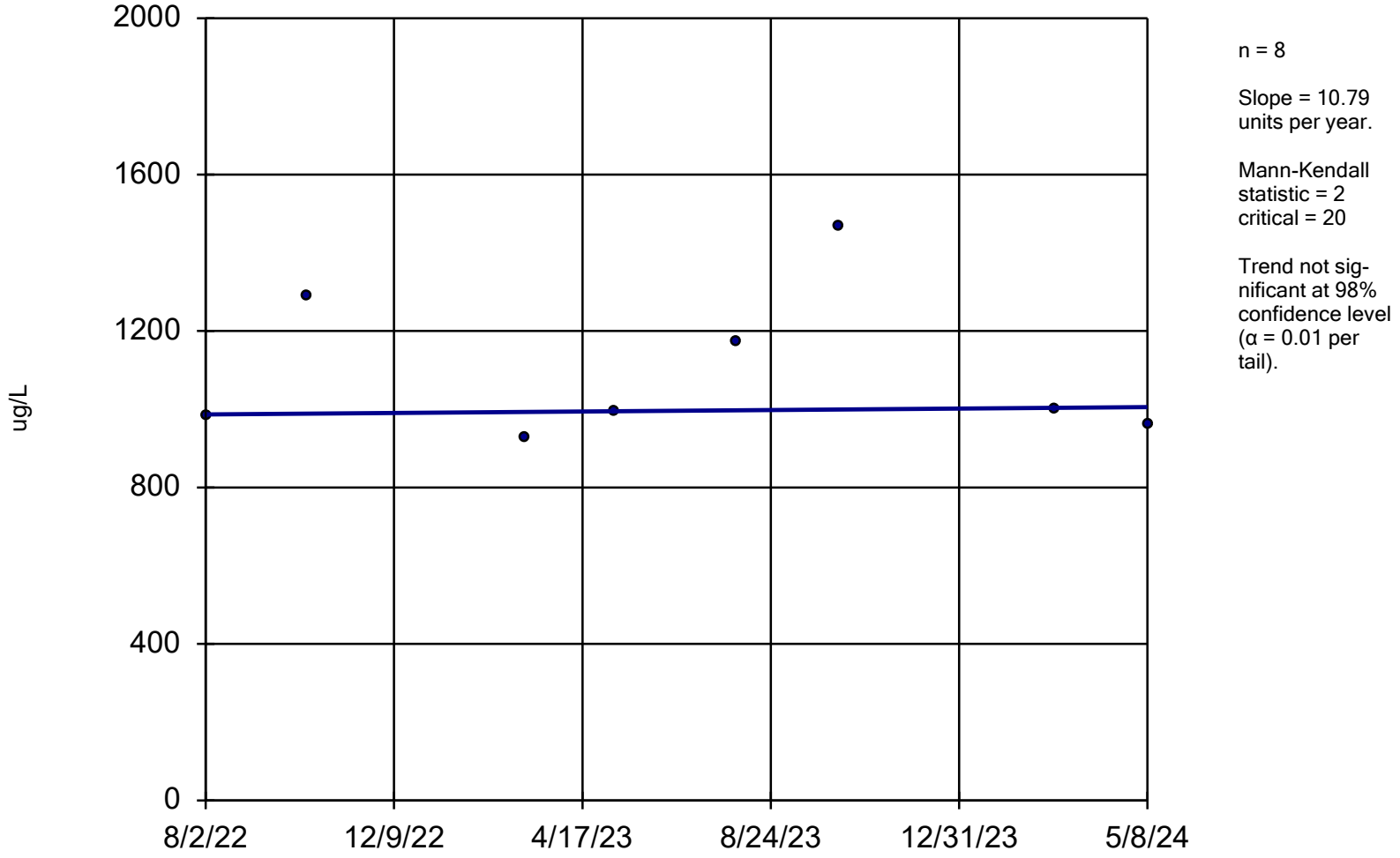
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

JCW-MW-18005



n = 8

Slope = 10.79 units per year.

Mann-Kendall statistic = 2
critical = 20

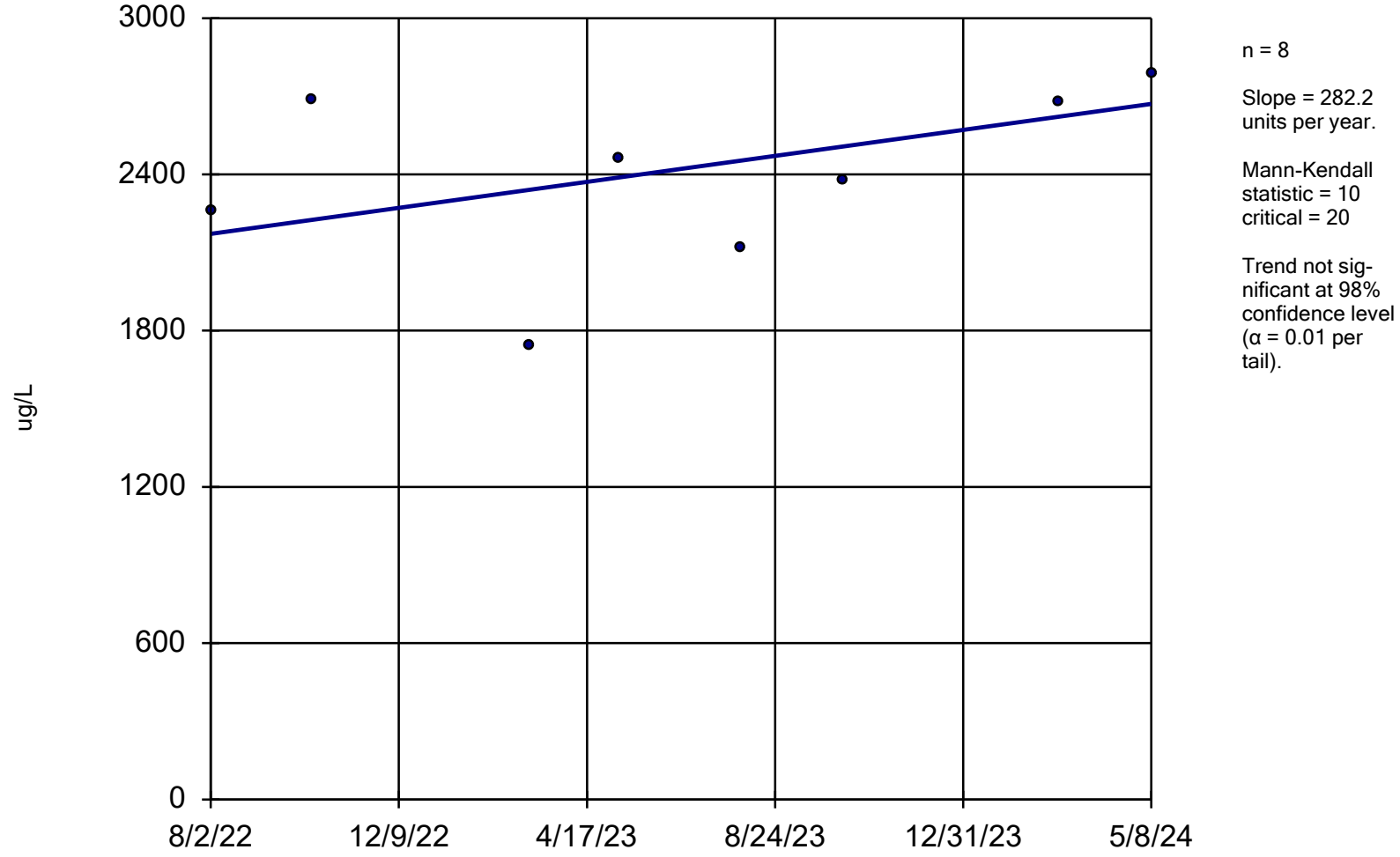
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

JCW-MW-18006



n = 8

Slope = 282.2 units per year.

Mann-Kendall statistic = 10
critical = 20

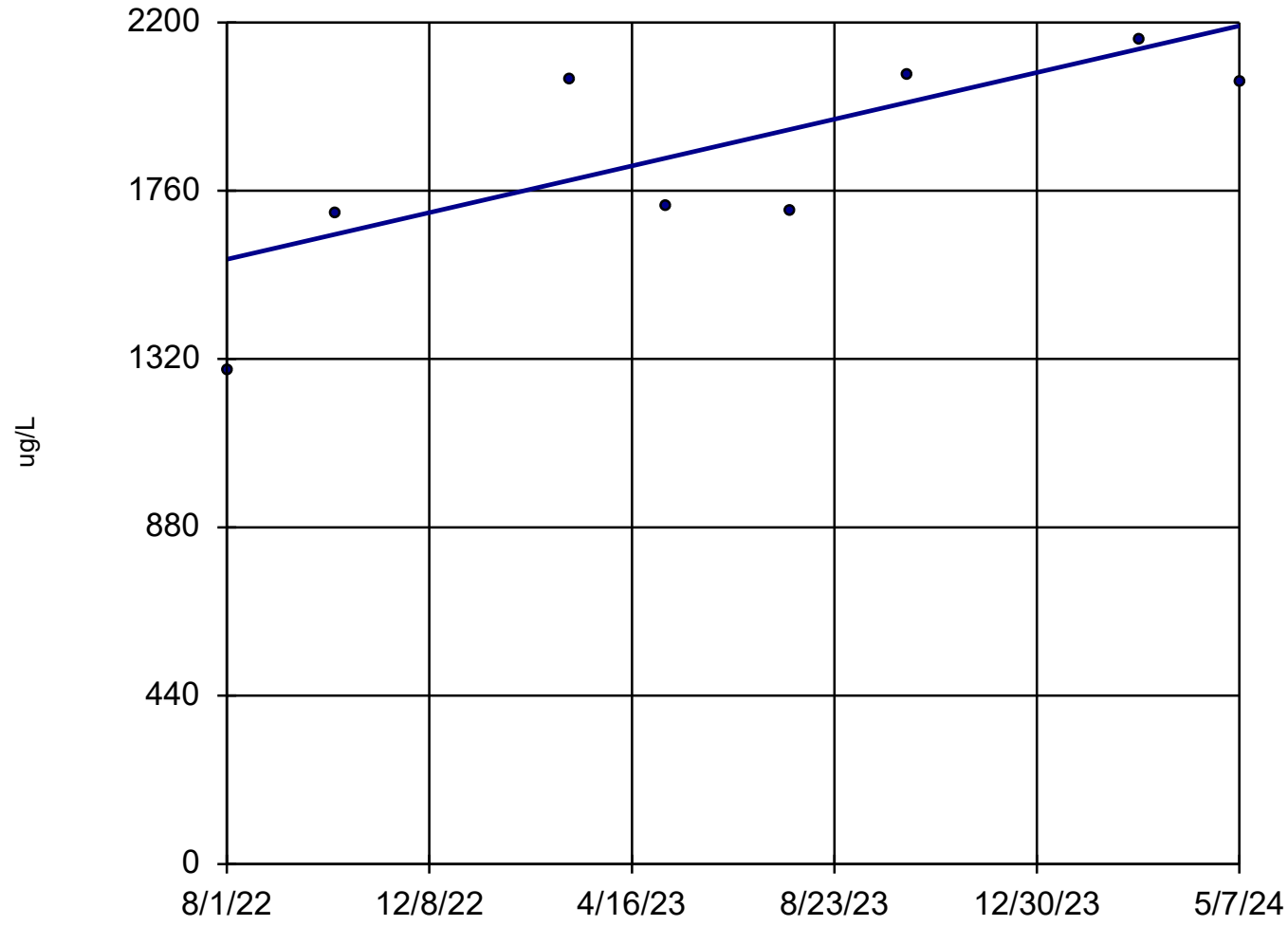
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-50



n = 8

Slope = 345.5 units per year.

Mann-Kendall statistic = 16
critical = 20

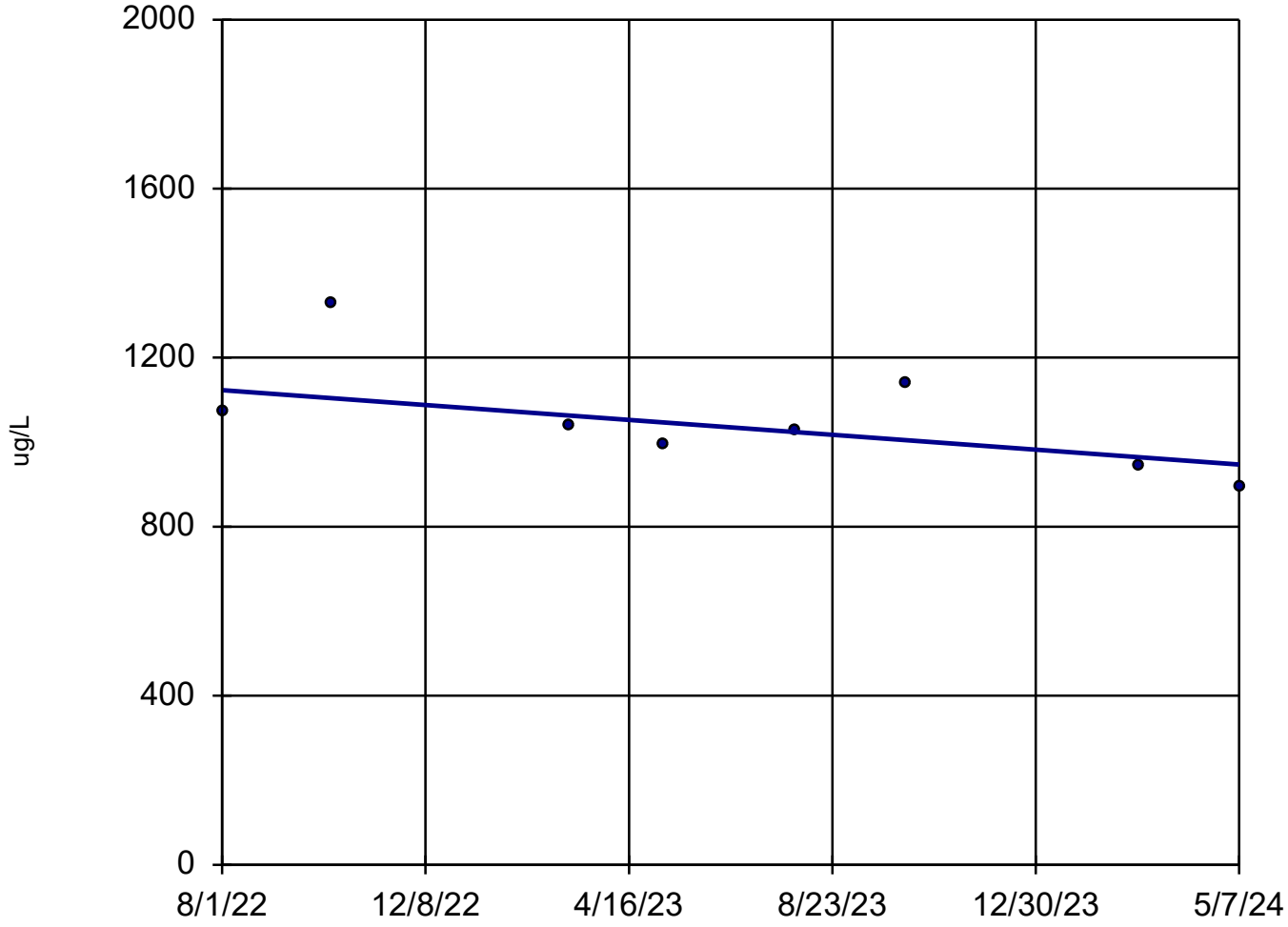
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-52



n = 8

Slope = -99.7 units per year.

Mann-Kendall statistic = -16
critical = -20

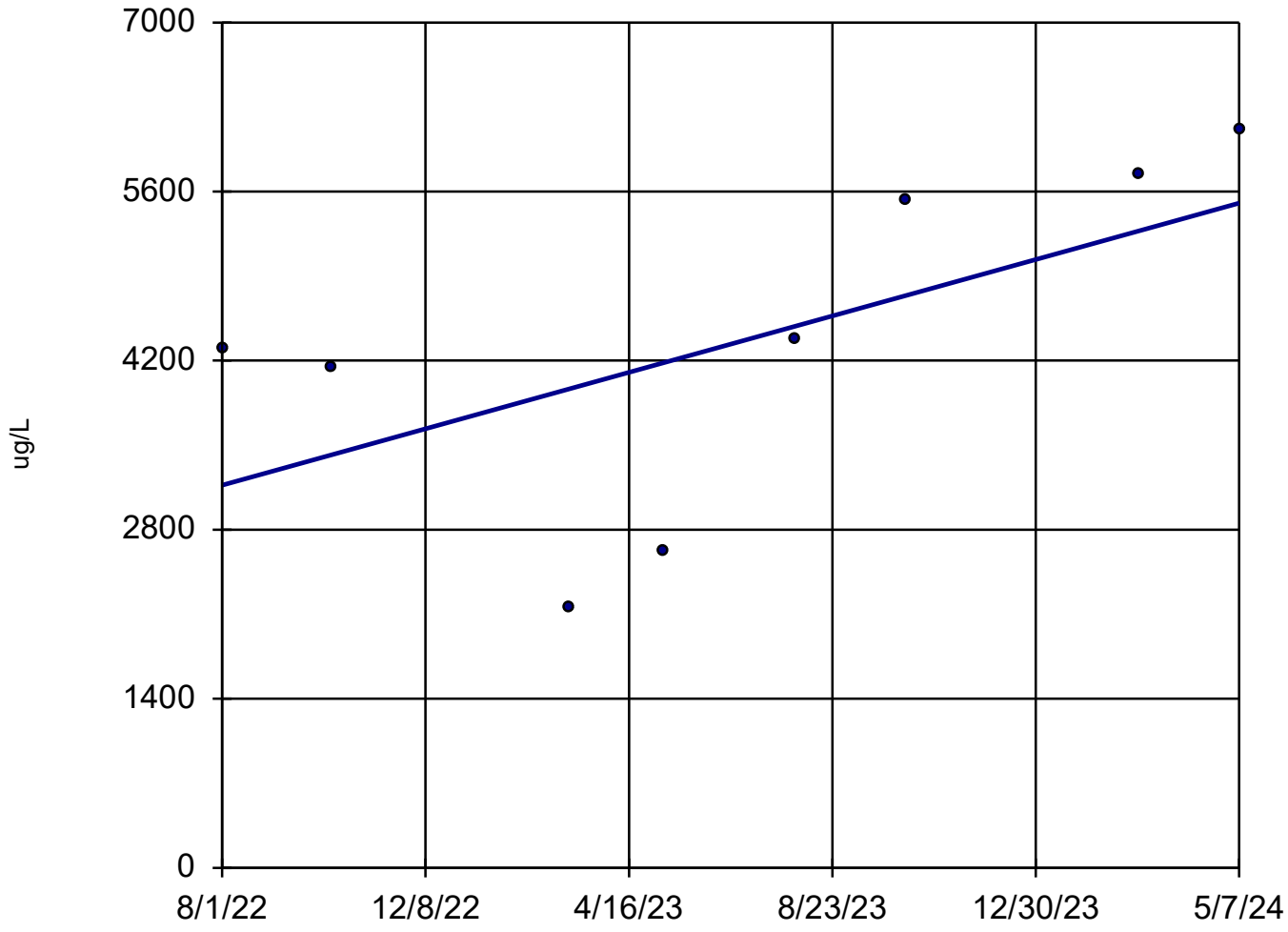
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-53



n = 8

Slope = 1322 units per year.

Mann-Kendall statistic = 18 critical = 20

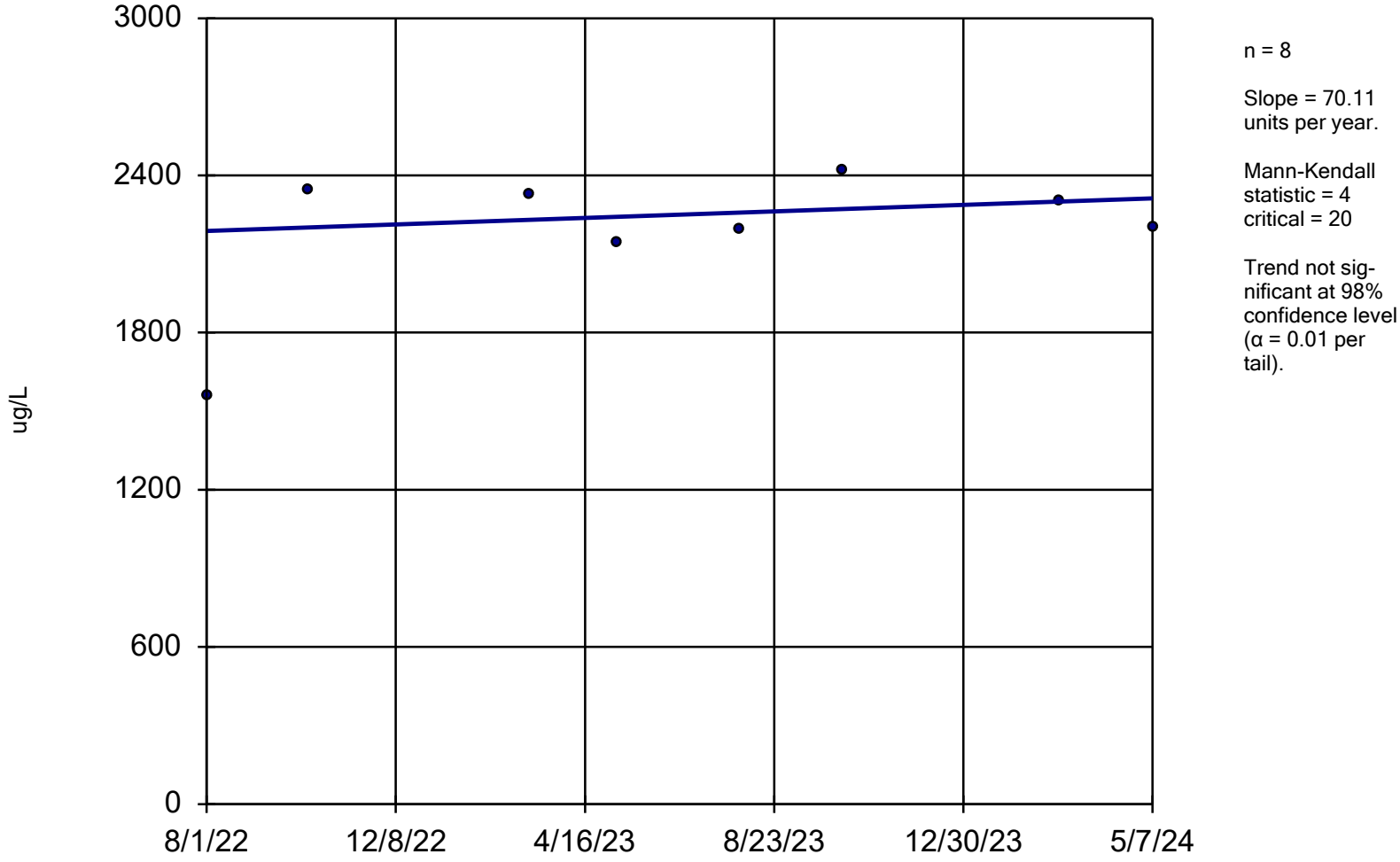
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-53R



n = 8

Slope = 70.11 units per year.

Mann-Kendall statistic = 4
critical = 20

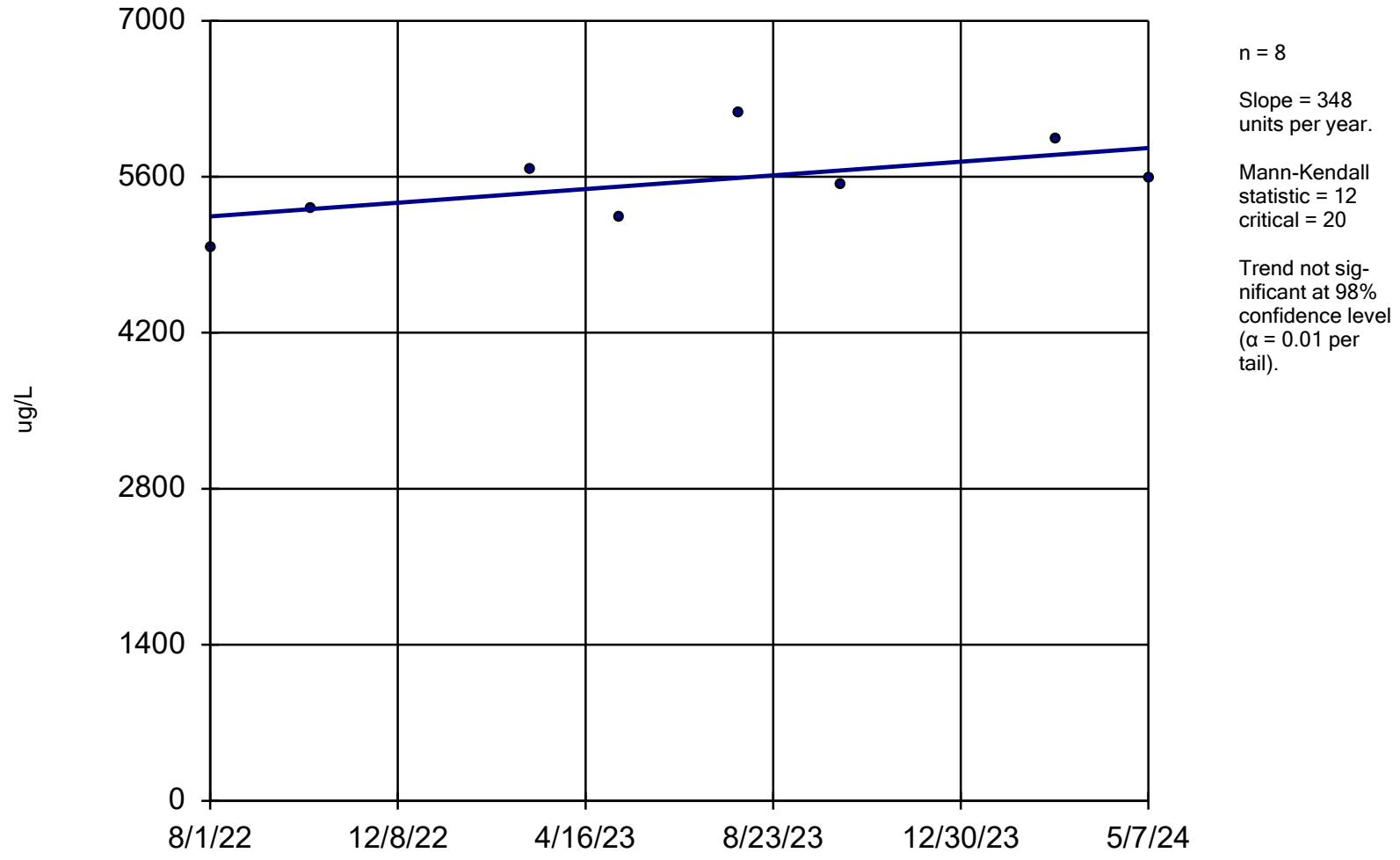
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-54R



n = 8

Slope = 348 units per year.

Mann-Kendall statistic = 12
critical = 20

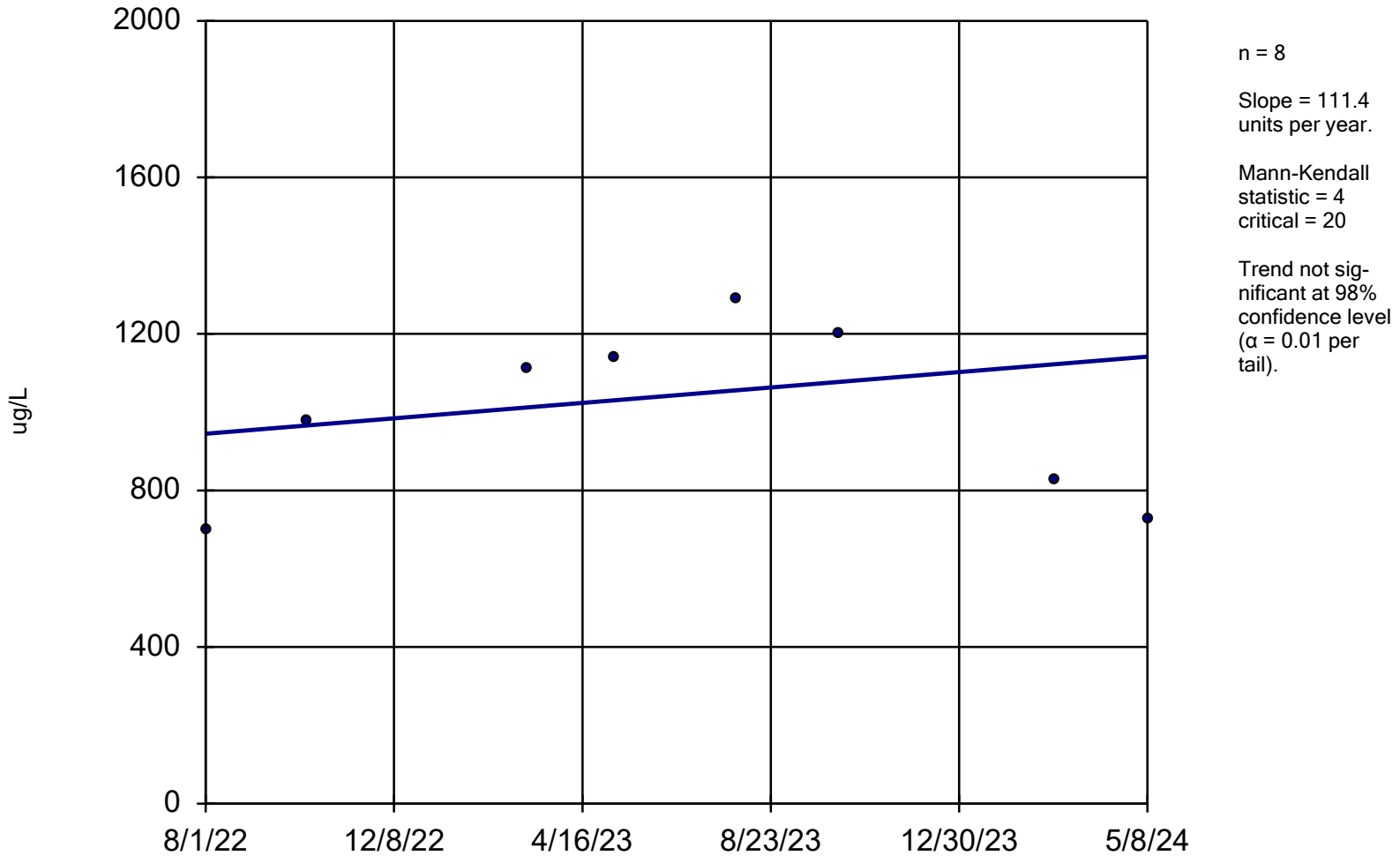
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-55



n = 8

Slope = 111.4 units per year.

Mann-Kendall statistic = 4
critical = 20

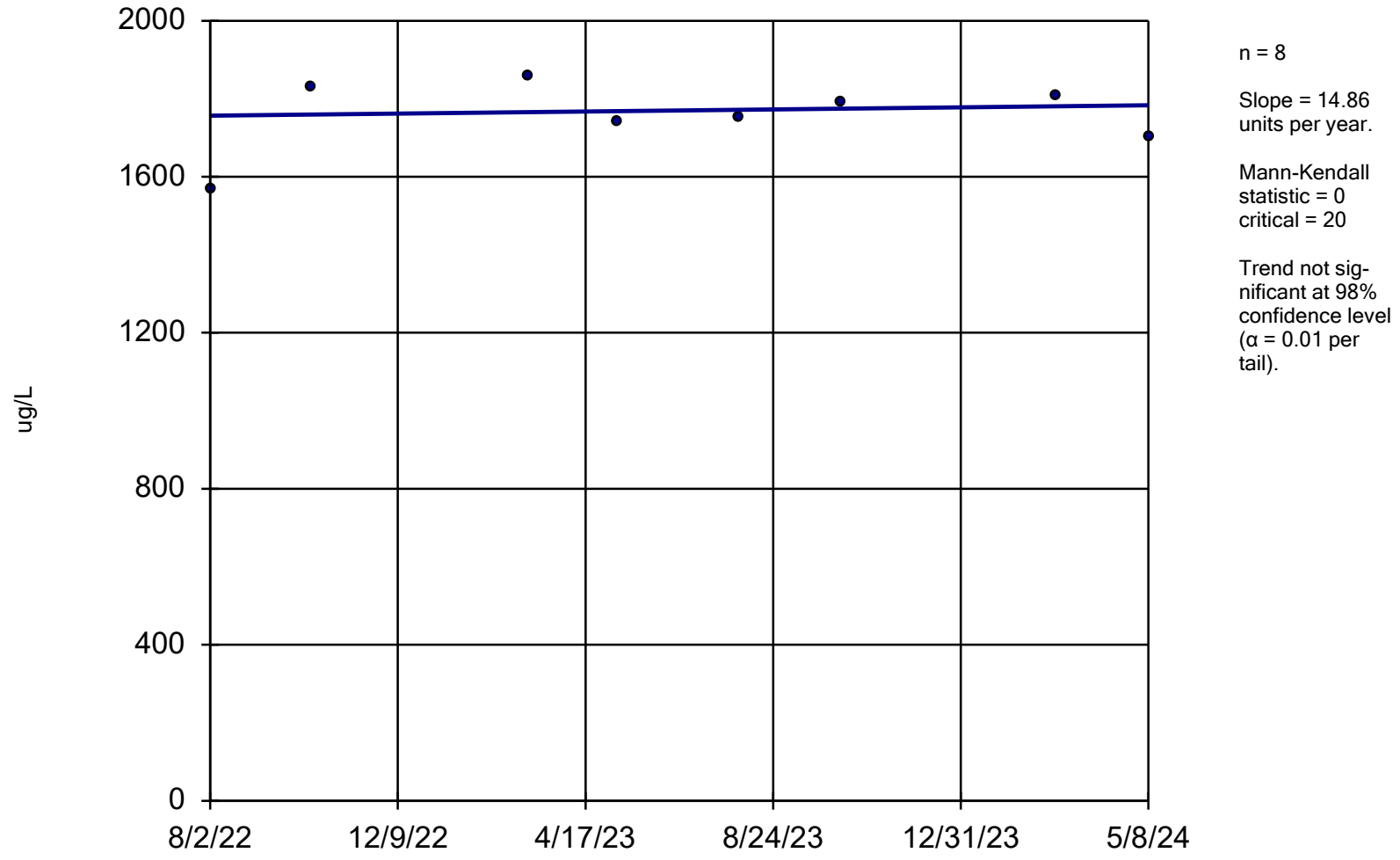
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

OW-57ROUT



n = 8

Slope = 14.86 units per year.

Mann-Kendall statistic = 0
critical = 20

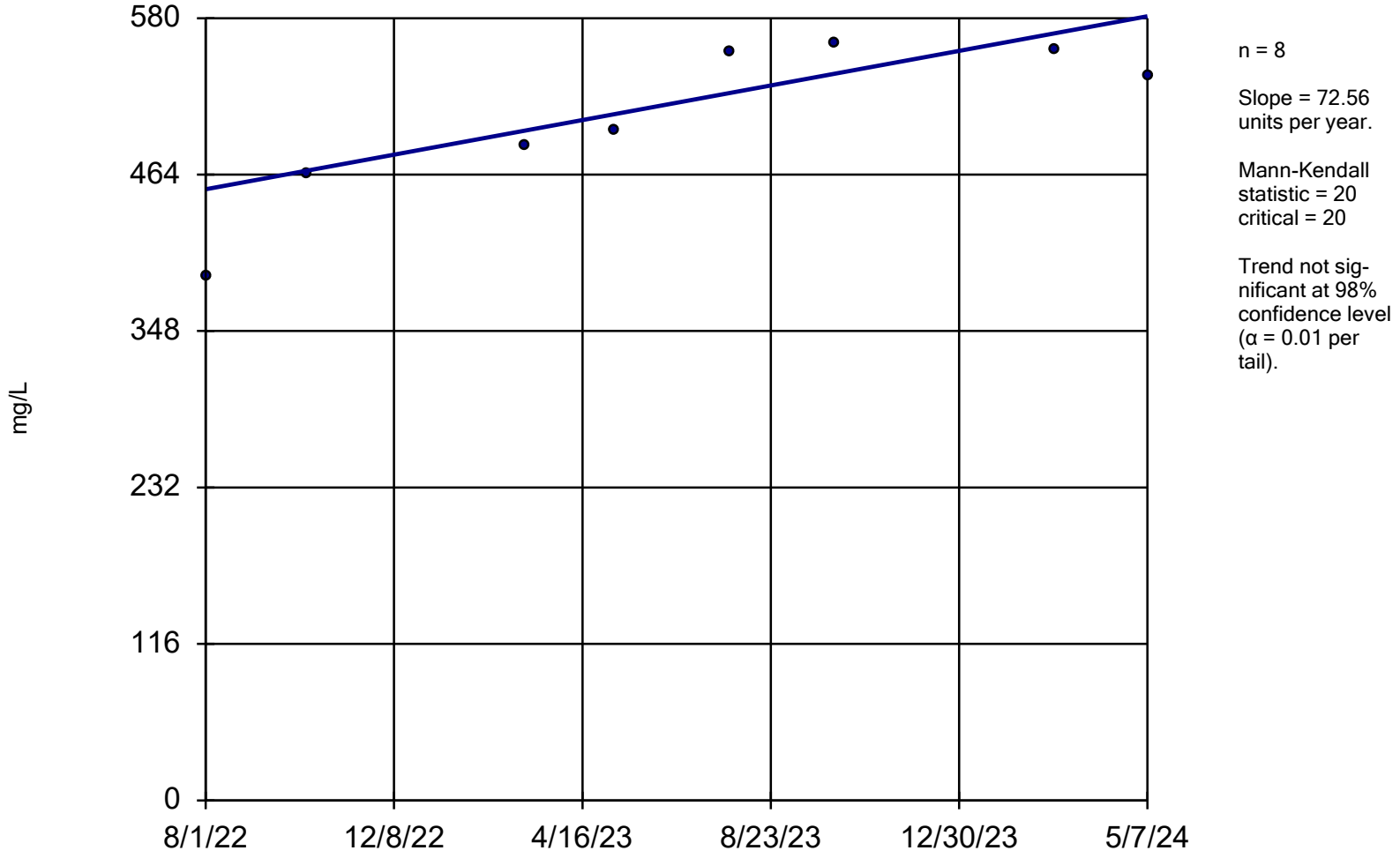
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/13/2024 3:45 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Calcium, Total

JCW-MW-18001



n = 8

Slope = 72.56 units per year.

Mann-Kendall statistic = 20
critical = 20

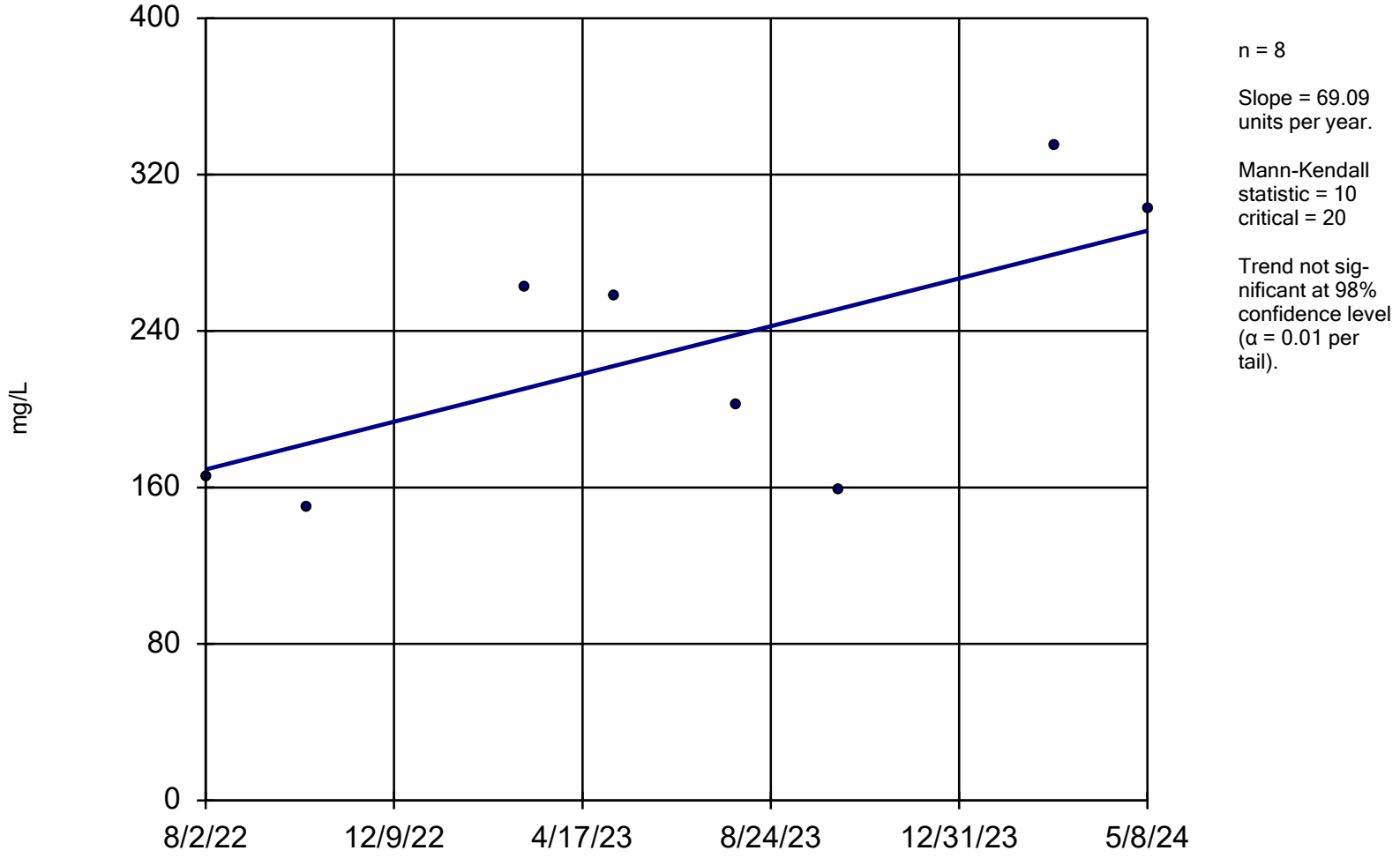
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 6/14/2024 12:19 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Calcium, Total

JCW-MW-18005

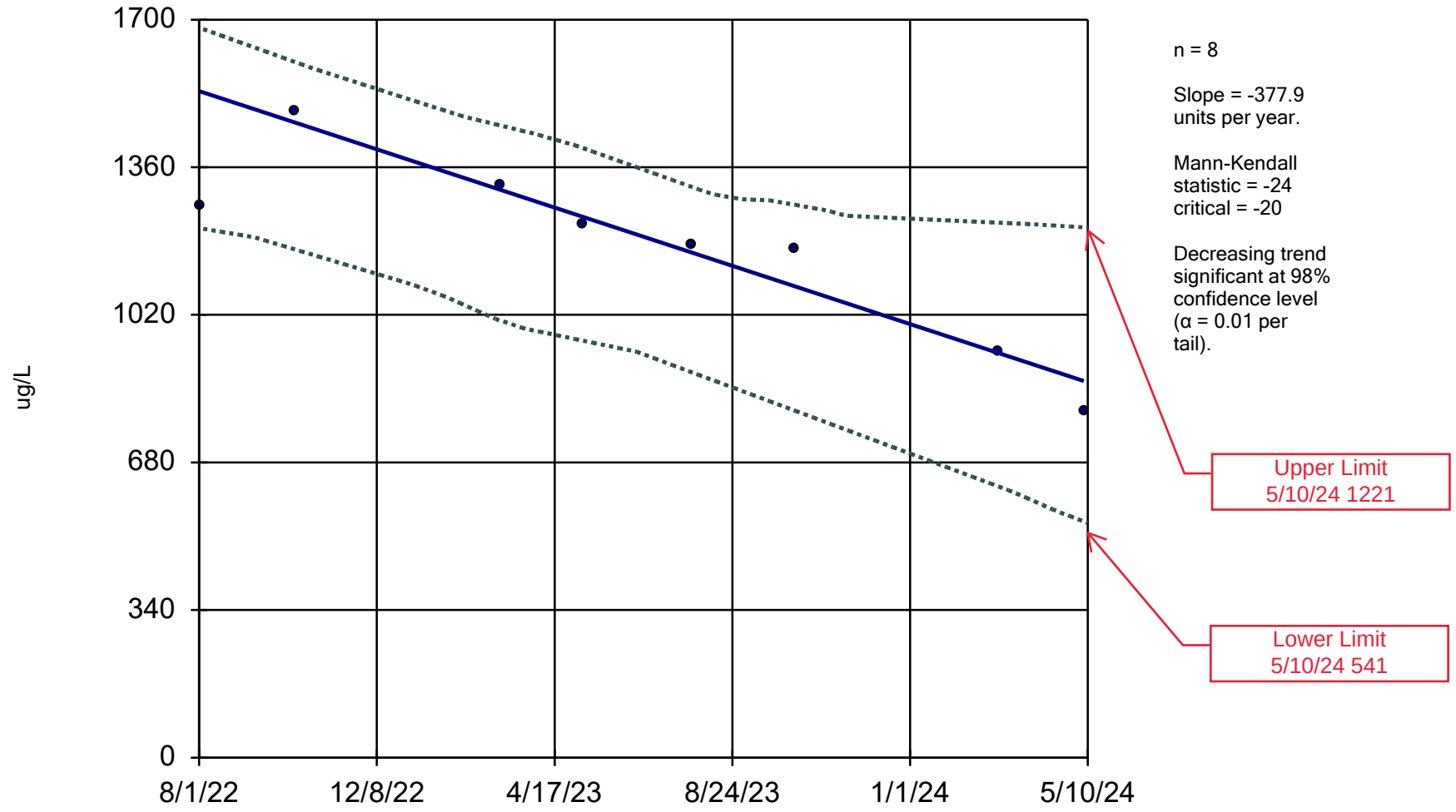


Sen's Slope and 98% Confidence Band Analysis Run 6/14/2024 12:19 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Boron, Total

MW-51

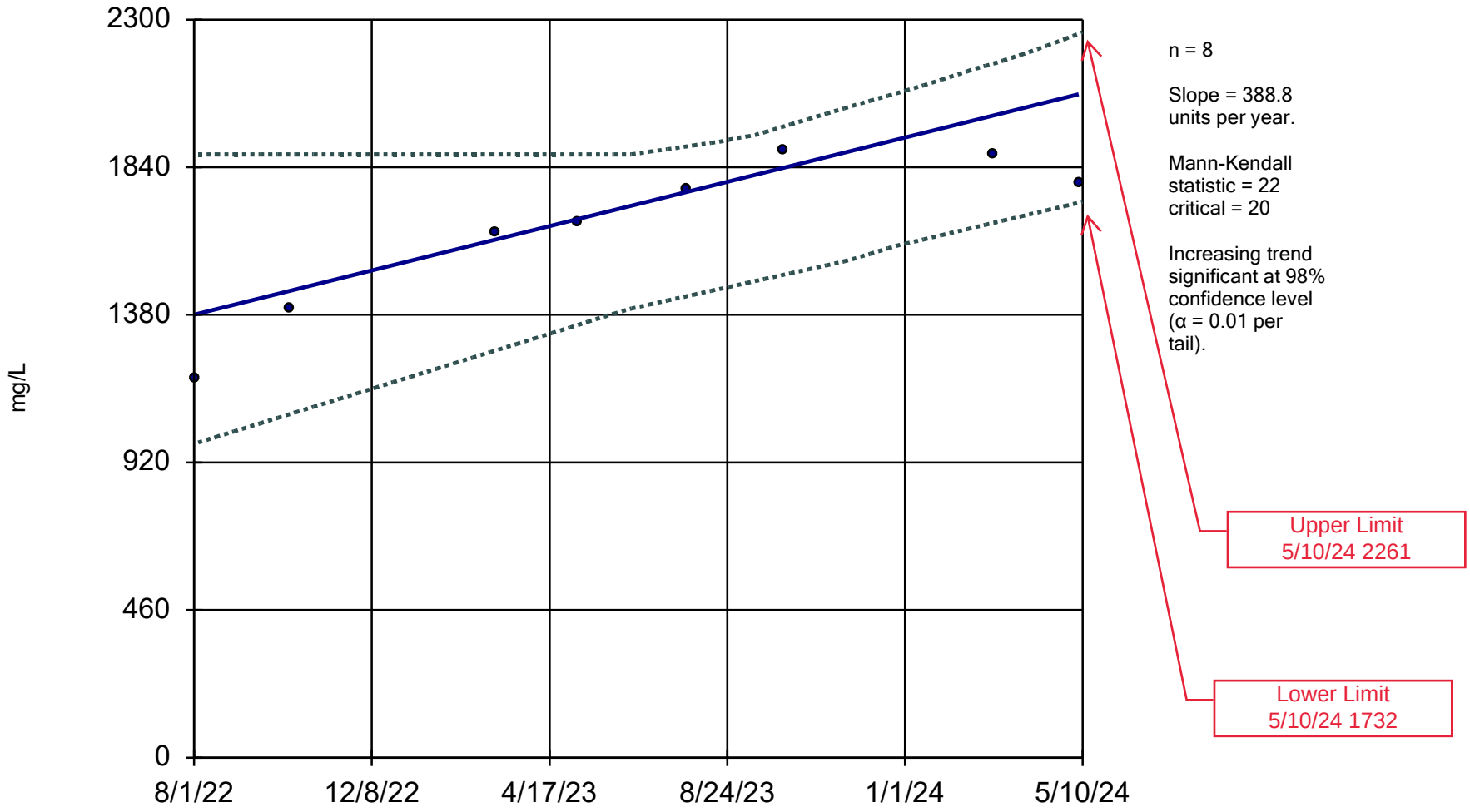


Sen's Slope and 98% Confidence Band Analysis Run 6/14/2024 11:49 AM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Sulfate

JCW-MW-18001

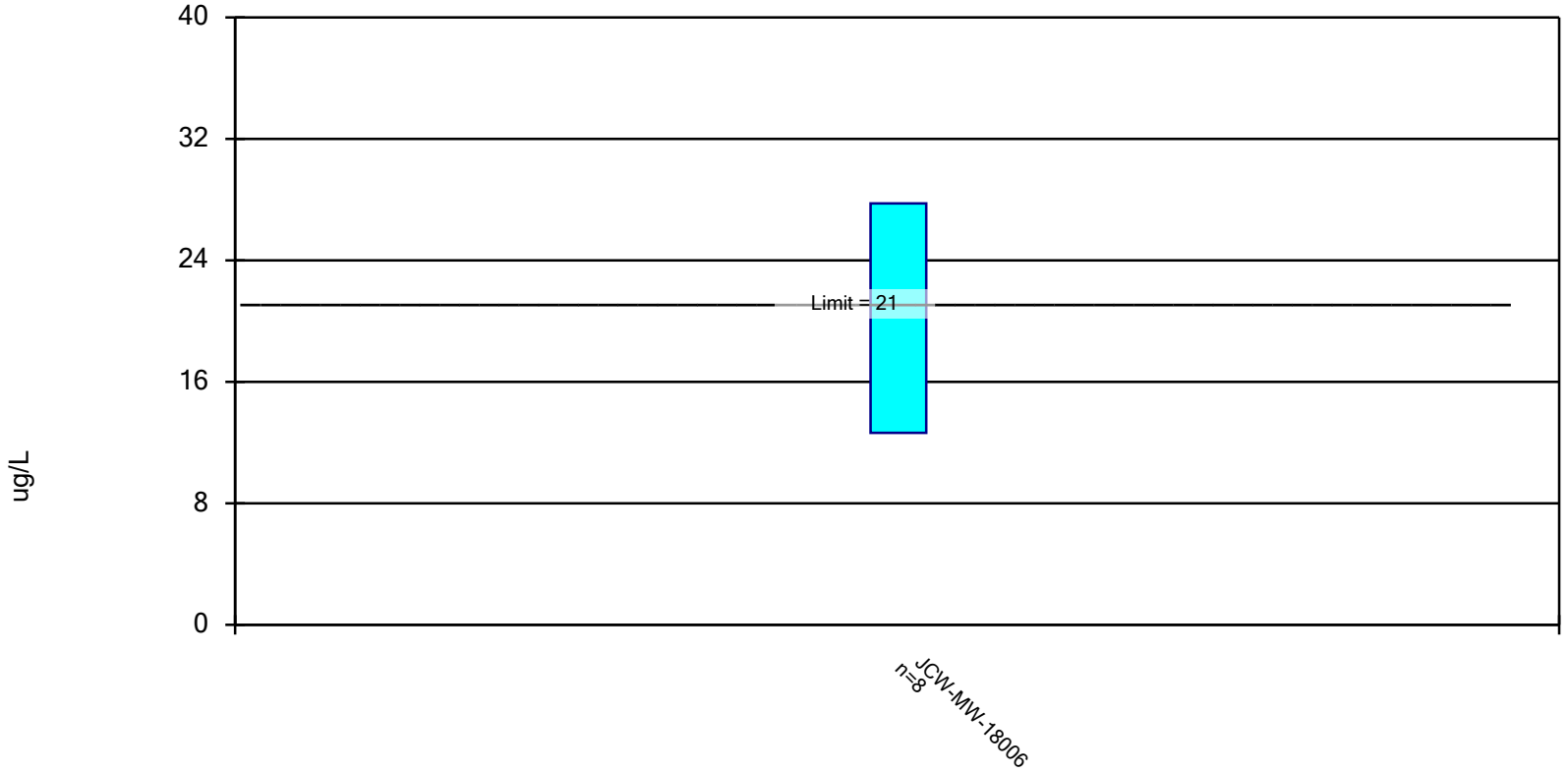


Sen's Slope and 98% Confidence Band Analysis Run 6/14/2024 12:21 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 6/14/2024 1:05 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Confidence Interval

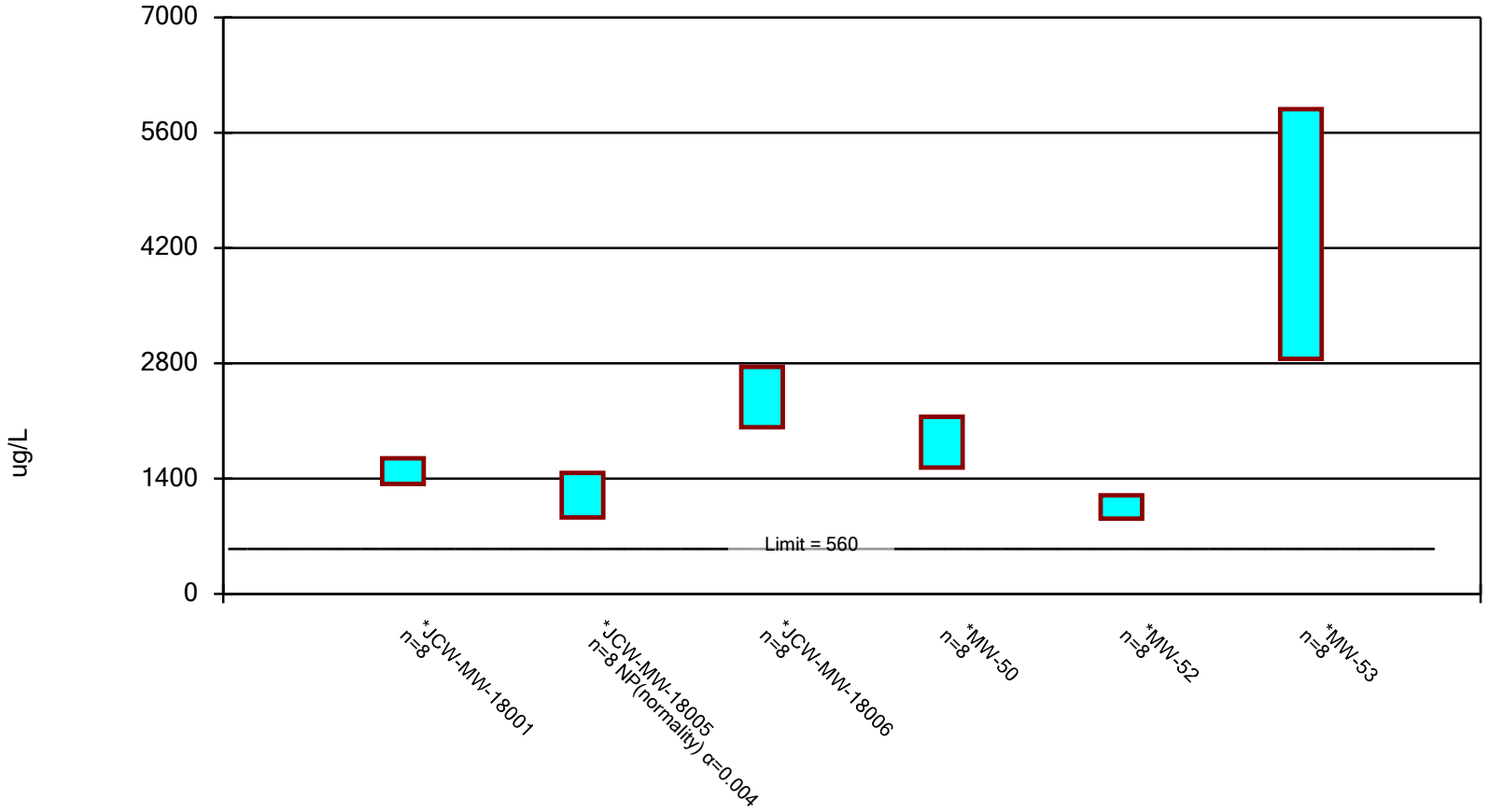
Constituent: Arsenic, Total (ug/L) Analysis Run 6/14/2024 1:05 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

	JCW-MW-18006
8/2/2022	21 (D)
10/11/2022	25 (D)
3/9/2023	5 (D)
5/9/2023	23 (D)
7/31/2023	18.5 (D)
10/9/2023	17.5 (D)
3/6/2024	22.5 (D)
5/8/2024	29 (D)
Mean	20.19
Std. Dev.	7.126
Upper Lim.	27.74
Lower Lim.	12.63

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron, Total Analysis Run 6/14/2024 1:03 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Confidence Interval

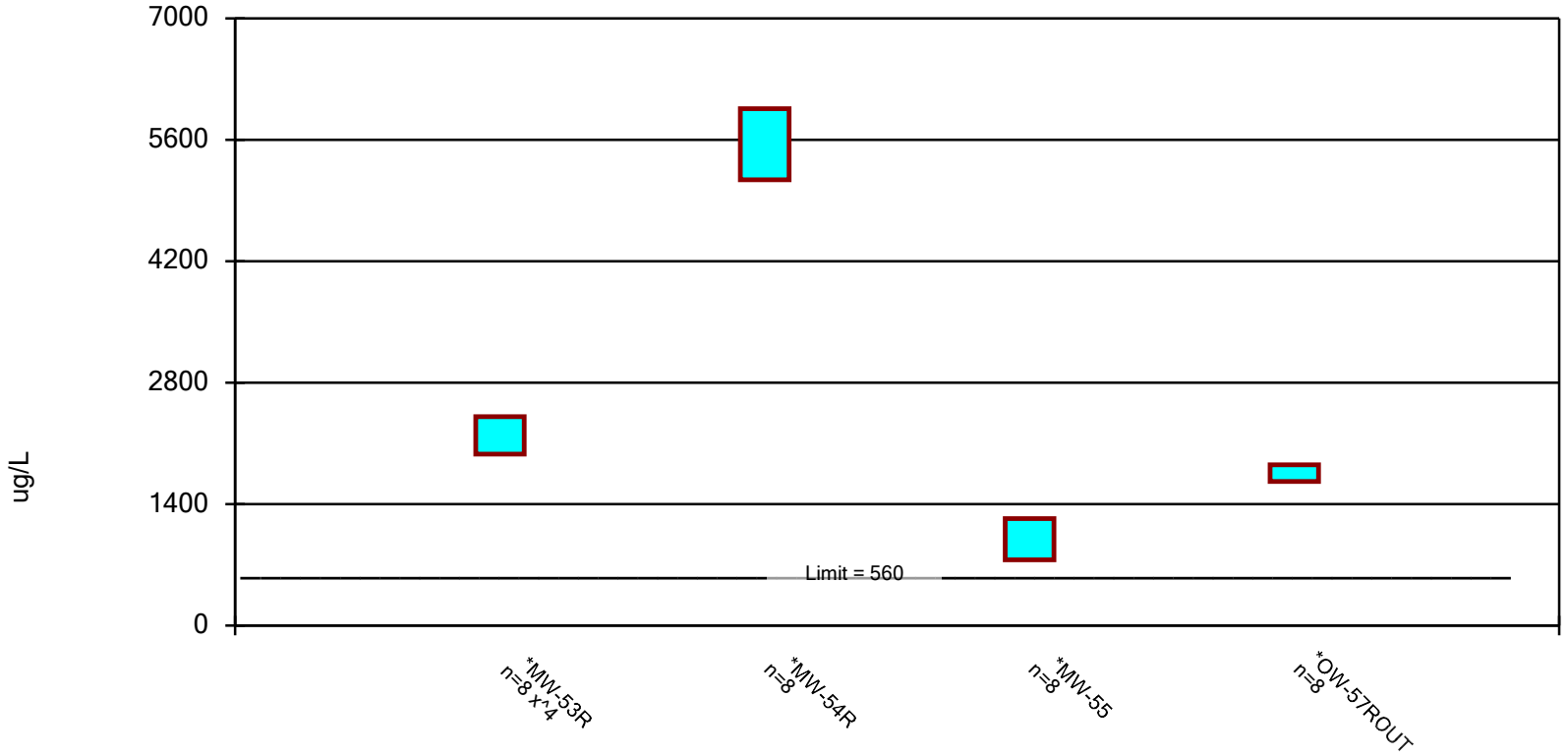
Constituent: Boron, Total (ug/L) Analysis Run 6/14/2024 1:04 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

	JCW-MW-18001	JCW-MW-18005	JCW-MW-18006	MW-50	MW-52	MW-53
8/1/2022	1470 (D)			1290 (D)	1070 (D)	4300 (D)
8/2/2022		981 (D)	2260 (D)			
10/10/2022	1790 (D)			1700 (D)	1330 (D)	4140 (D)
10/11/2022		1290 (D)	2685 (D)			
3/8/2023	1440 (D)			2050 (D)		
3/9/2023		930 (D)	1745 (D)		1040 (D)	2150 (D)
5/8/2023	1380 (D)			1720 (D)	993 (D)	2620 (D)
5/9/2023		992 (D)	2465 (D)			
7/26/2023	1470 (D)			1705 (D)		
7/31/2023		1170 (D)	2120 (D)		1030 (D)	4370 (D)
10/5/2023	1620 (D)					
10/9/2023		1470 (D)	2375 (D)	2065 (D)	1140 (D)	5530 (D)
3/5/2024	1420 (D)			2155 (D)	945 (D)	5740 (D)
3/6/2024		1000 (D)	2675 (D)			
5/7/2024	1330 (D)			2045 (D)	895 (D)	6110 (D)
5/8/2024		960 (D)	2785 (D)			
Mean	1490	1099	2389	1841	1055	4370
Std. Dev.	147.7	193.5	345.6	290.5	133.9	1429
Upper Lim.	1647	1470	2755	2149	1197	5885
Lower Lim.	1333	930	2022	1533	913.5	2855

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron, Total Analysis Run 6/14/2024 1:03 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Confidence Interval

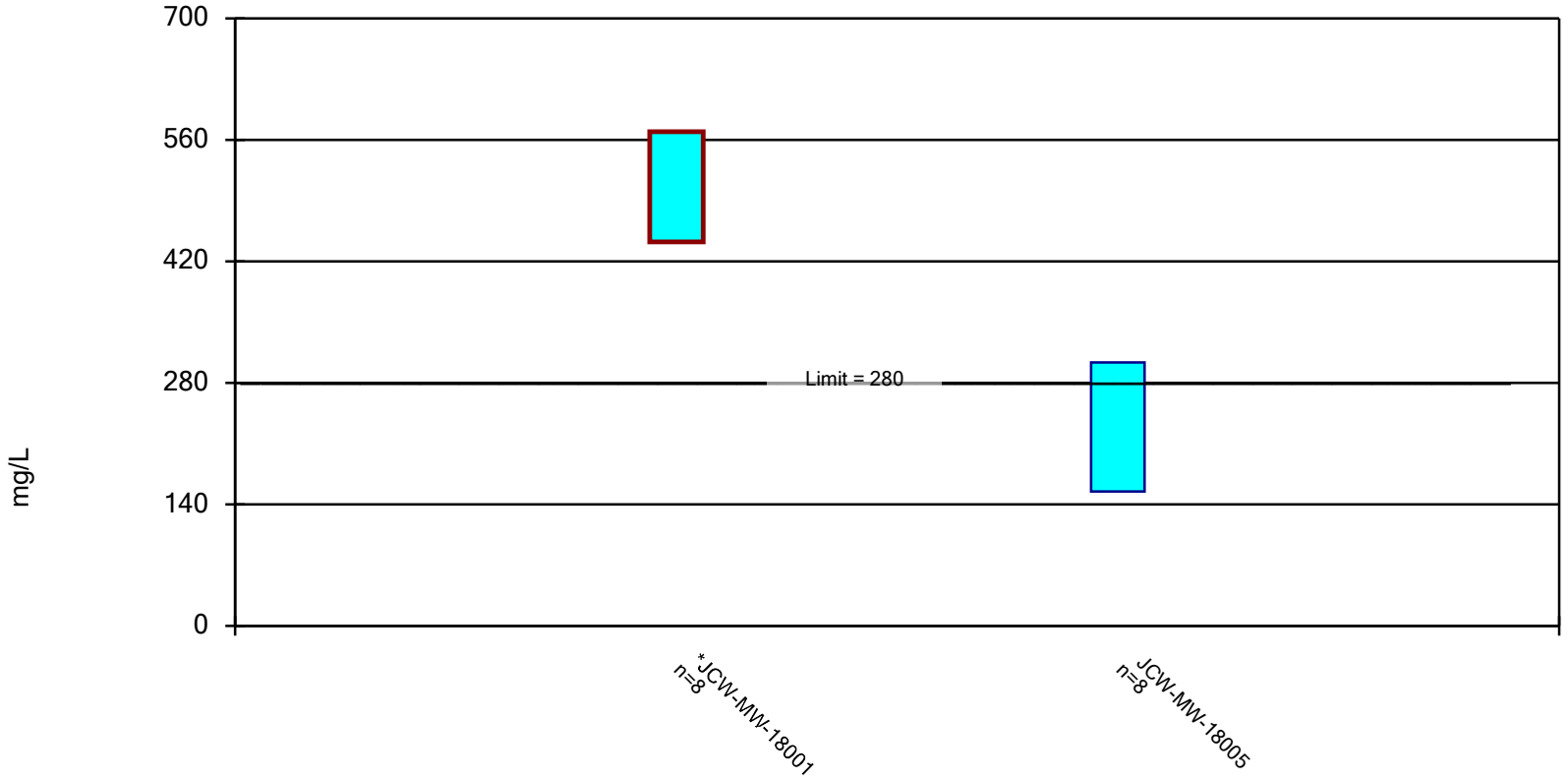
Constituent: Boron, Total (ug/L) Analysis Run 6/14/2024 1:04 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

	MW-53R	MW-54R	MW-55	OW-57ROUT
8/1/2022	1560 (D)	4970 (D)	698 (D)	
8/2/2022				1570 (D)
10/10/2022	2340 (D)	5310 (D)	976 (D)	
10/11/2022				1830 (D)
3/9/2023	2330 (D)	5660 (D)	1110 (D)	1860 (D)
5/8/2023	2140 (D)			
5/9/2023		5240 (D)	1140 (D)	1740 (D)
7/31/2023	2190 (D)	6170 (D)	1290 (D)	1750 (D)
10/9/2023	2420 (D)	5520 (D)	1200 (D)	1790 (D)
3/5/2024	2300 (D)	5940 (D)	825 (D)	
3/6/2024				1810 (D)
5/7/2024	2200 (D)	5580 (D)		
5/8/2024			729 (D)	1700 (D)
Mean	2185	5549	996	1756
Std. Dev.	269	385.5	224.1	91.33
Upper Lim.	2407	5957	1234	1853
Lower Lim.	1975	5140	758.5	1659

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium, Total Analysis Run 6/14/2024 1:02 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Confidence Interval

Constituent: Calcium, Total (mg/L) Analysis Run 6/14/2024 1:02 PM

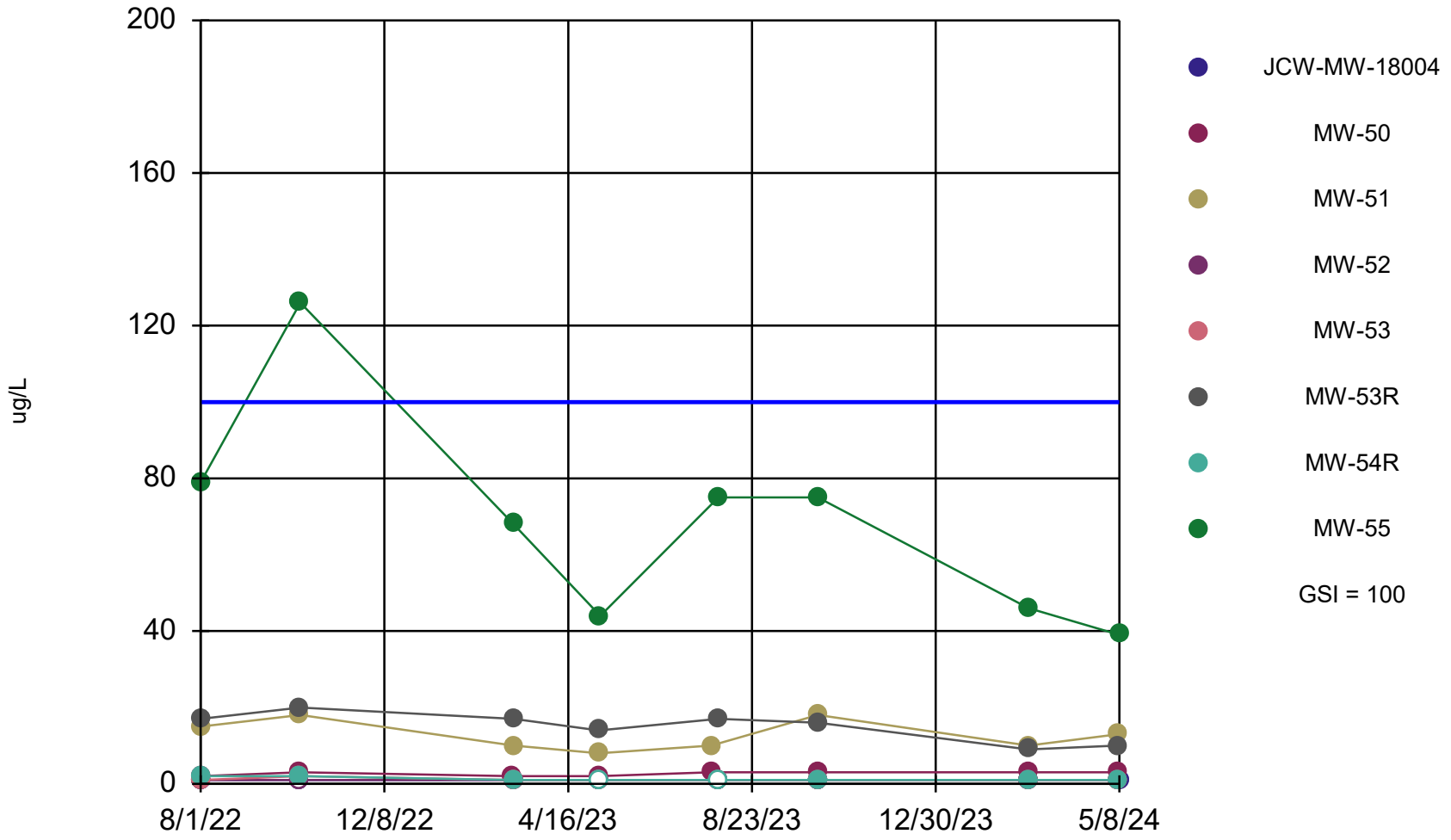
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

	JCW-MW-18001	JCW-MW-18005
8/1/2022	389 (D)	
8/2/2022		165 (D)
10/10/2022	465 (D)	
10/11/2022		150 (D)
3/8/2023	486 (D)	
3/9/2023		262 (D)
5/8/2023	496 (D)	
5/9/2023		258 (D)
7/26/2023	555 (D)	
7/31/2023		202 (D)
10/5/2023	562 (D)	
10/9/2023		159 (D)
3/5/2024	557 (D)	
3/6/2024		335 (D)
5/7/2024	537 (D)	
5/8/2024		302 (D)
Mean	505.9	229.1
Std. Dev.	59.72	70.16
Upper Lim.	569.2	303.5
Lower Lim.	442.6	154.8

Attachment 2
GSI Evaluation Sanitas™ Output Files

Hollow symbols indicate censored values.

Arsenic Comparison to GSI



Time Series Analysis Run 6/19/2024 2:02 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Summary Report

Constituent: Arsenic, Total Analysis Run 6/19/2024 2:04 PM
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

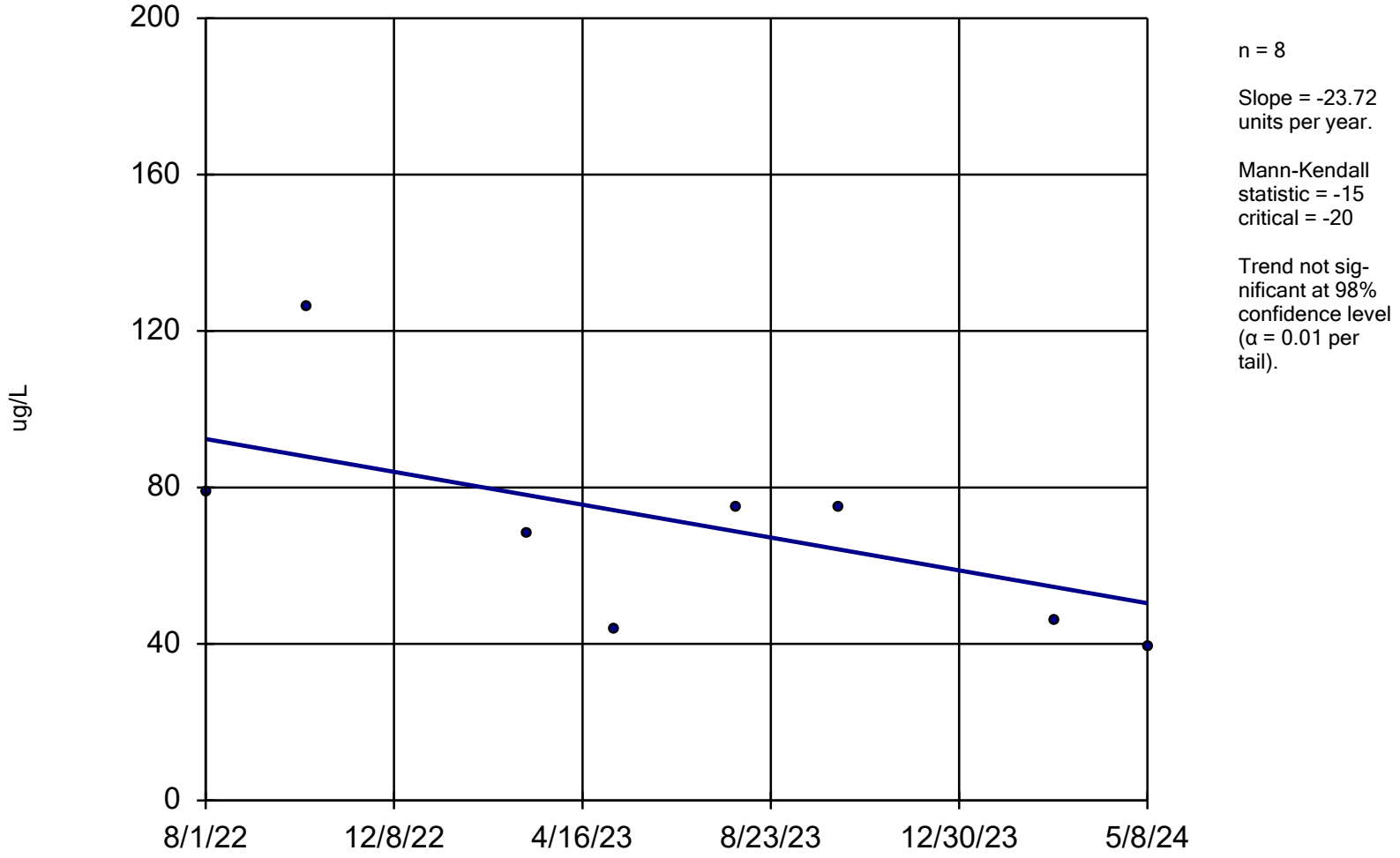
For observations made between 8/1/2022 and 5/8/2024, a summary of the selected data set:

Observations = 64
NDs = 31%
Wells = 8
Minimum Value = 1
Maximum Value = 126
Mean Value = 12.97
Median Value = 2
Standard Deviation = 23.97
Coefficient of Variation = 1.848
Skewness = 2.784

Well	#Obs.	NDs	Min	Max	Mean	Median	Std.Dev.	CV	Skewness
JCW-MW-18004	8	100%	1	1	1	1	0	0	NaN
MW-50	8	0%	2	3	2.625	3	0.5175	0.1972	-0.5164
MW-51	8	0%	8	18	12.75	11.5	3.882	0.3045	0.3426
MW-52	8	100%	1	1	1	1	0	0	NaN
MW-53	8	25%	1	2	1.125	1	0.3536	0.3143	2.268
MW-53R	8	0%	9	20	15	16.5	3.78	0.252	-0.5431
MW-54R	8	25%	1	2	1.25	1	0.4629	0.3703	1.155
MW-55	8	0%	39	126	69	71.5	27.97	0.4054	0.9202

Arsenic, Total

MW-55



n = 8

Slope = -23.72 units per year.

Mann-Kendall statistic = -15
critical = -20

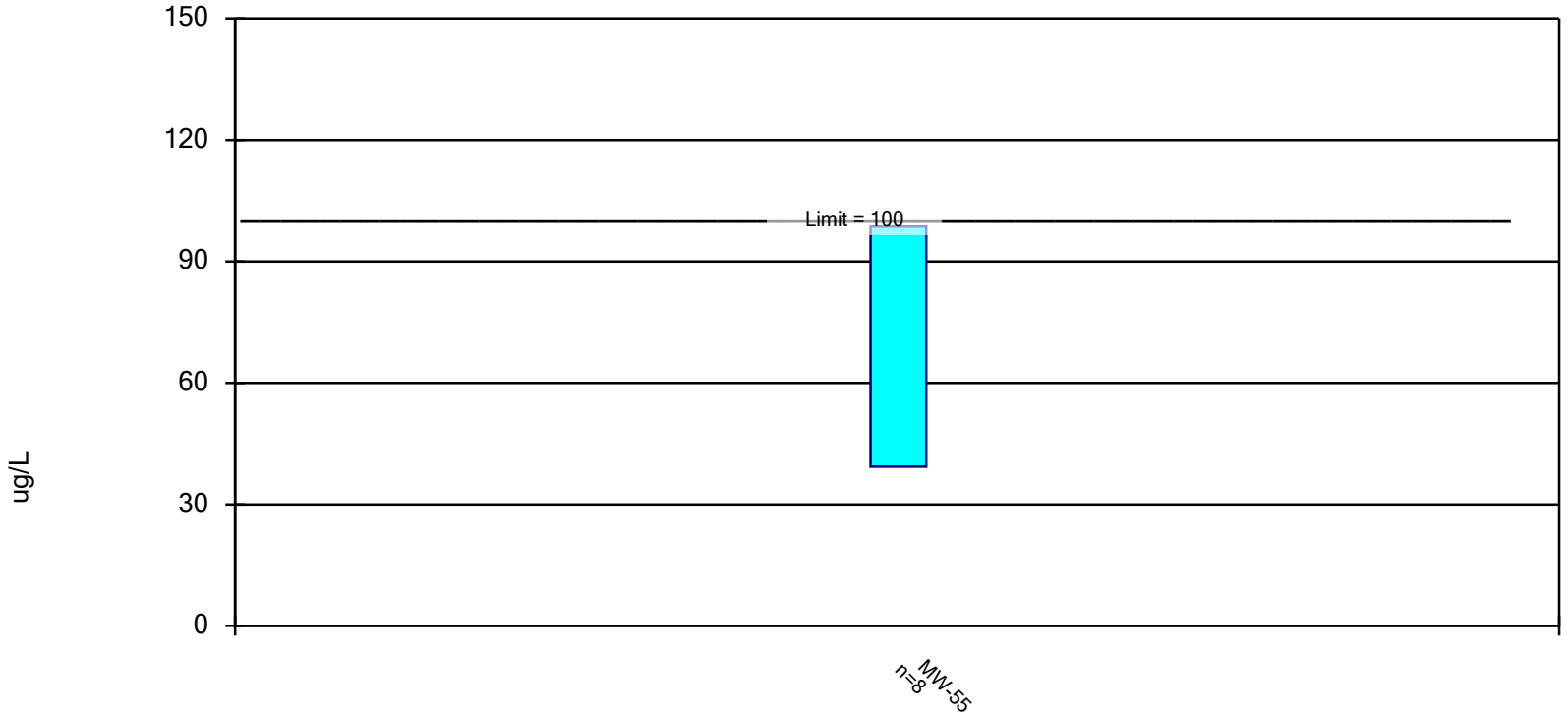
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope and 98% Confidence Band Analysis Run 6/19/2024 2:04 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 6/19/2024 2:07 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Confidence Interval

Constituent: Arsenic, Total (ug/L) Analysis Run 6/19/2024 2:07 PM

Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

	MW-55
8/1/2022	79 (D)
10/10/2022	126 (D)
3/9/2023	68 (D)
5/9/2023	44 (D)
7/31/2023	75 (D)
10/9/2023	75 (D)
3/5/2024	46 (D)
5/8/2024	39 (D)
Mean	69
Std. Dev.	27.97
Upper Lim.	98.65
Lower Lim.	39.35

Appendix E
Laboratory Analytical Report

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135 W. Trail St.
Jackson, MI 49201

phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: May 23, 2024

Subject: RCRA GROUNDWATER MONITORING – DEK-JCW BACKGROUND WELLS – 2024 Q2

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0343

TRC Environmental, Inc. conducted groundwater monitoring at the Karn/Weadock Background Wells area during the week of 05/06/2024 for the 2nd Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 05/10/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative, or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section, when applicable; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q2-2024 DEK-JCW Background Wells
Date Received: 5/10/2024
Chemistry Project: 24-0343

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0343-01	MW-15002	Groundwater	05/08/2024 14:51	DEK JCW Background
24-0343-02	MW-15008	Groundwater	05/08/2024 13:15	DEK JCW Background
24-0343-03	MW-15016	Groundwater	05/08/2024 14:47	DEK JCW Background
24-0343-04	MW-15019	Groundwater	05/08/2024 14:13	DEK JCW Background
24-0343-05	DUP-Background	Groundwater	05/08/2024 00:00	DEK JCW Background
24-0343-06	FB- Background	Water	05/08/2024 16:05	DEK JCW Background

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Analytical Report

Report Date: 05/23/24

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15002**
Lab Sample ID: 24-0343-01
Matrix: Groundwater

Laboratory Project: **24-0343**
Collect Date: 05/08/2024
Collect Time: 02:51 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0343-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Arsenic	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Barium	43		ug/L	5.0	05/14/2024	AB24-0515-01
Beryllium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Boron	21		ug/L	20.0	05/14/2024	AB24-0515-01
Cadmium	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Calcium	55900		ug/L	1000.0	05/14/2024	AB24-0515-01
Chromium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Cobalt	ND		ug/L	6.0	05/14/2024	AB24-0515-01
Copper	2		ug/L	1.0	05/14/2024	AB24-0515-01
Iron	526		ug/L	20.0	05/14/2024	AB24-0515-01
Lead	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Lithium	ND		ug/L	10.0	05/14/2024	AB24-0515-01
Magnesium	6360		ug/L	1000.0	05/14/2024	AB24-0515-01
Molybdenum	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Nickel	2		ug/L	2.0	05/14/2024	AB24-0515-01
Potassium	243		ug/L	100.0	05/14/2024	AB24-0515-01
Selenium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Silver	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Sodium	51500		ug/L	1000.0	05/14/2024	AB24-0515-01
Thallium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Vanadium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Zinc	ND		ug/L	10.0	05/14/2024	AB24-0515-01

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0343-01-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0343-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	28300		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	7530		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0343-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	358		mg/L	10.0	05/10/2024	AB24-0510-10

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Analytical Report

Report Date: 05/23/24

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15008**
Lab Sample ID: 24-0343-02
Matrix: Groundwater

Laboratory Project: **24-0343**
Collect Date: 05/08/2024
Collect Time: 01:15 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0343-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Arsenic	3		ug/L	1.0	05/14/2024	AB24-0515-01
Barium	93		ug/L	5.0	05/14/2024	AB24-0515-01
Beryllium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Boron	142		ug/L	20.0	05/14/2024	AB24-0515-01
Cadmium	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Calcium	121000		ug/L	1000.0	05/14/2024	AB24-0515-01
Chromium	1		ug/L	1.0	05/14/2024	AB24-0515-01
Cobalt	ND		ug/L	6.0	05/14/2024	AB24-0515-01
Copper	1		ug/L	1.0	05/14/2024	AB24-0515-01
Iron	16900		ug/L	20.0	05/14/2024	AB24-0515-01
Lead	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Lithium	22		ug/L	10.0	05/14/2024	AB24-0515-01
Magnesium	19300		ug/L	1000.0	05/14/2024	AB24-0515-01
Molybdenum	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Nickel	4		ug/L	2.0	05/14/2024	AB24-0515-01
Potassium	3180		ug/L	100.0	05/14/2024	AB24-0515-01
Selenium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Silver	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Sodium	221000		ug/L	1000.0	05/14/2024	AB24-0515-01
Thallium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Vanadium	9		ug/L	2.0	05/14/2024	AB24-0515-01
Zinc	ND		ug/L	10.0	05/14/2024	AB24-0515-01

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0343-02-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0343-02-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	395000		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	2570		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0343-02-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1280		mg/L	10.0	05/10/2024	AB24-0510-10

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Analytical Report

Report Date: 05/23/24

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15016**
Lab Sample ID: 24-0343-03
Matrix: Groundwater

Laboratory Project: **24-0343**
Collect Date: 05/08/2024
Collect Time: 02:47 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0343-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Arsenic	17		ug/L	1.0	05/14/2024	AB24-0515-01
Barium	157		ug/L	5.0	05/14/2024	AB24-0515-01
Beryllium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Boron	398		ug/L	20.0	05/14/2024	AB24-0515-01
Cadmium	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Calcium	243000		ug/L	1000.0	05/14/2024	AB24-0515-01
Chromium	1		ug/L	1.0	05/14/2024	AB24-0515-01
Cobalt	ND		ug/L	6.0	05/14/2024	AB24-0515-01
Copper	2		ug/L	1.0	05/14/2024	AB24-0515-01
Iron	21900		ug/L	20.0	05/14/2024	AB24-0515-01
Lead	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Lithium	68		ug/L	10.0	05/14/2024	AB24-0515-01
Magnesium	39200		ug/L	1000.0	05/14/2024	AB24-0515-01
Molybdenum	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Nickel	10		ug/L	2.0	05/14/2024	AB24-0515-01
Potassium	9050		ug/L	100.0	05/14/2024	AB24-0515-01
Selenium	1		ug/L	1.0	05/14/2024	AB24-0515-01
Silver	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Sodium	96000		ug/L	1000.0	05/14/2024	AB24-0515-01
Thallium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Vanadium	2		ug/L	2.0	05/14/2024	AB24-0515-01
Zinc	ND		ug/L	10.0	05/14/2024	AB24-0515-01

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0343-03-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0343-03-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	175000		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	194000		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0343-03-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1190		mg/L	10.0	05/10/2024	AB24-0510-10

Sample Site: **DEK JCW Background**
Field Sample ID: **MW-15019**
Lab Sample ID: 24-0343-04
Matrix: Groundwater

Laboratory Project: **24-0343**
Collect Date: 05/08/2024
Collect Time: 02:13 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0343-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Arsenic	2		ug/L	1.0	05/14/2024	AB24-0515-01
Barium	364		ug/L	5.0	05/14/2024	AB24-0515-01
Beryllium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Boron	241		ug/L	20.0	05/14/2024	AB24-0515-01
Cadmium	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Calcium	173000		ug/L	1000.0	05/14/2024	AB24-0515-01
Chromium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Cobalt	ND		ug/L	6.0	05/14/2024	AB24-0515-01
Copper	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Iron	23100		ug/L	20.0	05/14/2024	AB24-0515-01
Lead	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Lithium	14		ug/L	10.0	05/14/2024	AB24-0515-01
Magnesium	40900		ug/L	1000.0	05/14/2024	AB24-0515-01
Molybdenum	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Nickel	5		ug/L	2.0	05/14/2024	AB24-0515-01
Potassium	815		ug/L	100.0	05/14/2024	AB24-0515-01
Selenium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Silver	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Sodium	221000		ug/L	1000.0	05/14/2024	AB24-0515-01
Thallium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Vanadium	3		ug/L	2.0	05/14/2024	AB24-0515-01
Zinc	ND		ug/L	10.0	05/14/2024	AB24-0515-01

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0343-04-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0343-04-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	374000		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	93800		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0343-04-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1340		mg/L	10.0	05/10/2024	AB24-0510-10

Sample Site: **DEK JCW Background**
Field Sample ID: **DUP-Background**
Lab Sample ID: 24-0343-05
Matrix: Groundwater

Laboratory Project: **24-0343**
Collect Date: 05/08/2024
Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0343-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Arsenic	3		ug/L	1.0	05/14/2024	AB24-0515-01
Barium	92		ug/L	5.0	05/14/2024	AB24-0515-01
Beryllium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Boron	140		ug/L	20.0	05/14/2024	AB24-0515-01
Cadmium	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Calcium	124000		ug/L	1000.0	05/14/2024	AB24-0515-01
Chromium	1		ug/L	1.0	05/14/2024	AB24-0515-01
Cobalt	ND		ug/L	6.0	05/14/2024	AB24-0515-01
Copper	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Iron	17300		ug/L	20.0	05/14/2024	AB24-0515-01
Lead	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Lithium	22		ug/L	10.0	05/14/2024	AB24-0515-01
Magnesium	19400		ug/L	1000.0	05/14/2024	AB24-0515-01
Molybdenum	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Nickel	4		ug/L	2.0	05/14/2024	AB24-0515-01
Potassium	3970		ug/L	100.0	05/14/2024	AB24-0515-01
Selenium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Silver	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Sodium	223000		ug/L	1000.0	05/14/2024	AB24-0515-01
Thallium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Vanadium	8		ug/L	2.0	05/14/2024	AB24-0515-01
Zinc	ND		ug/L	10.0	05/14/2024	AB24-0515-01

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0343-05-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0343-05-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	395000		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	2520		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0343-05-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1210		mg/L	10.0	05/10/2024	AB24-0510-10

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Analytical Report

Report Date: 05/23/24

Sample Site: **DEK JCW Background**
Field Sample ID: **FB- Background**
Lab Sample ID: 24-0343-06
Matrix: Water

Laboratory Project: **24-0343**
Collect Date: 05/08/2024
Collect Time: 04:05 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0343-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Arsenic	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Barium	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Beryllium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Boron	ND		ug/L	20.0	05/14/2024	AB24-0515-01
Cadmium	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Calcium	ND		ug/L	1000.0	05/14/2024	AB24-0515-01
Chromium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Cobalt	ND		ug/L	6.0	05/14/2024	AB24-0515-01
Copper	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Iron	ND		ug/L	20.0	05/14/2024	AB24-0515-01
Lead	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Lithium	ND		ug/L	10.0	05/14/2024	AB24-0515-01
Magnesium	ND		ug/L	1000.0	05/14/2024	AB24-0515-01
Molybdenum	ND		ug/L	5.0	05/14/2024	AB24-0515-01
Nickel	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Potassium	ND		ug/L	100.0	05/14/2024	AB24-0515-01
Selenium	ND		ug/L	1.0	05/14/2024	AB24-0515-01
Silver	ND		ug/L	0.2	05/14/2024	AB24-0515-01
Sodium	ND		ug/L	1000.0	05/14/2024	AB24-0515-01
Thallium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Vanadium	ND		ug/L	2.0	05/14/2024	AB24-0515-01
Zinc	ND		ug/L	10.0	05/14/2024	AB24-0515-01

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0343-06-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0343

Inspection Date: 5/10/24 **Inspection By:** CIE

Sample Origin/Project Name: JCW-DEK Background

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/~~Hand~~ Carry (whom) TRC

Tracking Number: _____ Shipping Form Attached: Yes _____ No ____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer ____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 0.4 - 2.4°C Samples Received on Ice: Yes ✓ No ____

M&TE # and Expiration 015402 5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	11				
24 mL vial (glass)					
250 mL (plastic)	5				
Other					

FSP pit 0-14
13-640-508
Lot: 205522
exp: 2-15-25

PG. 2 & 2 not needed

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135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q2-2024 JCW-DEK Background Wells	PROJECT NUMBER: 24-0343	SAP CC or WO#:	ANALYSIS REQUESTED (Attach List if More Space is Needed)
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____
SEND REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register; TRC	MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste		

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	REMARKS
24-0343-01	5/8/24	1451	GW	MW-15002	3	2	1						x	x	x	
-02	5/8/24	1315	GW	MW-15008	3	2	1						x	x	x	
-03	5/8/24	1497	GW	MW-15016	3	2	1						x	x	x	
-04	5/8/24	1413	GW	MW-15019	3	2	1						x	x	x	
-05	5/8/24	—	GW	DUP-Background	3	2	1						x	x	x	
-06	5/8/24	1605	W	FB- Background	1								x			

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
	5/10/24 0700	
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015402

Temperature: 0.4-2.4 °C Cal. Due Date: 5-23-24

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Darby Litz
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Generated 6/14/2024 11:02:48 AM

JOB DESCRIPTION

Karn/Weadock CCR Background Well

JOB NUMBER

240-204358-1

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

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

Generated
6/14/2024 11:02:48 AM

Authorized for release by
Kris Brooks, Project Manager II
Kris.Brooks@et.eurofinsus.com
(330)966-9790

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Qualifiers

Rad

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

Glossary

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

Job ID: 240-204358-1 Eurofins Cleveland

Job Narrative
240-204358-1

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 5/11/2024 8:00 AM. 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 1.7°C, 3.4°C and 3.9°C.

Receipt Exceptions
The number of containers listed on the COC pages do not match what was received for the following: MW-15016 (240-204358-3) and EQ-BACKGROUND (240-204358-6). There is sufficient volume for the requested analyses.

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

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

Method Summary

Client: TRC Environmental Corporation.
Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-204358-1	MW-15002	Water	05/08/24 14:51	05/11/24 08:00
240-204358-2	MW-15008	Water	05/08/24 13:15	05/11/24 08:00
240-204358-3	MW-15016	Water	05/08/24 14:57	05/11/24 08:00
240-204358-4	MW-15019	Water	05/08/24 14:13	05/11/24 08:00
240-204358-5	DUP-BACKGROUND	Water	05/08/24 00:00	05/11/24 08:00
240-204358-6	EQ-BACKGROUND	Water	05/08/24 16:05	05/11/24 08:00

Client Sample ID: MW-15002 — Lab Sample ID: 240-204358-1

Date Collected: 05/08/24 14:51 — **Matrix: Water**
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0657	U	0.0534	0.0537	1.00	0.0742	pCi/L	05/16/24 09:22	06/12/24 10:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*05/16/24 09:22*	*06/12/24 10:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0468	U	0.277	0.277	1.00	0.512	pCi/L	05/16/24 09:27	05/22/24 16:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*
Y Carrier	*82.2*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.113	U	0.282	0.282	5.00	0.512	pCi/L		06/13/24 11:50	1

Client Sample ID: MW-15008 — Lab Sample ID: 240-204358-2

Date Collected: 05/08/24 13:15 — **Matrix: Water**
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.589**		0.166	0.175	1.00	0.123	pCi/L	05/16/24 09:22	06/12/24 10:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*73.6*		*30 - 110*	*05/16/24 09:22*	*06/12/24 10:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.438	U	0.514	0.516	1.00	0.847	pCi/L	05/16/24 09:27	05/22/24 16:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*73.6*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*
Y Carrier	*81.1*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.03**		0.540	0.545	5.00	0.847	pCi/L		06/13/24 11:50	1

Client Sample ID: MW-15016 — Lab Sample ID: 240-204358-3

Date Collected: 05/08/24 14:57 — **Matrix: Water**
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.143	U	0.104	0.105	1.00	0.149	pCi/L	05/16/24 09:22	06/12/24 10:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.3*		*30 - 110*	*05/16/24 09:22*	*06/12/24 10:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.229	U	0.413	0.414	1.00	0.715	pCi/L	05/16/24 09:27	05/22/24 16:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.3*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*
Y Carrier	*81.5*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.372	U	0.426	0.427	5.00	0.715	pCi/L		06/13/24 11:50	1

Client Sample ID: MW-15019 — Lab Sample ID: 240-204358-4

Date Collected: 05/08/24 14:13 — **Matrix: Water**
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.332**		0.116	0.120	1.00	0.0982	pCi/L	05/16/24 09:22	06/12/24 10:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*30 - 110*	*05/16/24 09:22*	*06/12/24 10:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.490	U	0.409	0.412	1.00	0.638	pCi/L	05/16/24 09:27	05/22/24 16:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*
Y Carrier	*87.1*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:22*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.822**		0.425	0.429	5.00	0.638	pCi/L		06/13/24 11:50	1

Client Sample ID: DUP-BACKGROUND
Lab Sample ID: 240-204358-5
Date Collected: 05/08/24 00:00
Matrix: Water
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.443		0.146	0.151	1.00	0.151	pCi/L	05/16/24 09:22	06/12/24 10:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*05/16/24 09:22*	*06/12/24 10:06*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.29		0.568	0.580	1.00	0.751	pCi/L	05/16/24 09:27	05/22/24 16:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:39*	*1*
Y Carrier	*83.4*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:39*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.73		0.586	0.599	5.00	0.751	pCi/L		06/13/24 11:50	1

Client Sample ID: EQ-BACKGROUND
Lab Sample ID: 240-204358-6

Date Collected: 05/08/24 16:05
Matrix: Water
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0109	U	0.0568	0.0568	1.00	0.111	pCi/L	05/16/24 09:22	06/12/24 10:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*75.6*		*30 - 110*	*05/16/24 09:22*	*06/12/24 10:06*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0753	U	0.394	0.394	1.00	0.712	pCi/L	05/16/24 09:27	05/22/24 16:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*75.6*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:39*	*1*
Y Carrier	*83.0*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:39*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0862	U	0.398	0.398	5.00	0.712	pCi/L		06/13/24 11:50	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.
Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
240-204358-1	MW-15002	85.1
240-204358-2	MW-15008	73.6
240-204358-3	MW-15016	83.3
240-204358-4	MW-15019	92.8
240-204358-5	DUP-BACKGROUND	85.1
240-204358-6	EQ-BACKGROUND	75.6
LCS 160-662015/2-A	Lab Control Sample	89.6
MB 160-662015/1-A	Method Blank	94.3

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
240-204358-1	MW-15002	85.1	82.2
240-204358-2	MW-15008	73.6	81.1
240-204358-3	MW-15016	83.3	81.5
240-204358-4	MW-15019	92.8	87.1
240-204358-5	DUP-BACKGROUND	85.1	83.4
240-204358-6	EQ-BACKGROUND	75.6	83.0
LCS 160-662016/2-A	Lab Control Sample	89.6	81.5
MB 160-662016/1-A	Method Blank	94.3	81.9

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-662015/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 665824 — **Prep Batch: 662015**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03763	U	0.0464	0.0466	1.00	0.0761	pCi/L	05/16/24 09:22	06/12/24 09:56	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.3*		*30 - 110*	*05/16/24 09:22*	*06/12/24 09:56*	*1*

Lab Sample ID: LCS 160-662015/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 665824 — **Prep Batch: 662015**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.29		1.15	1.00	0.0974	pCi/L	100	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*89.6*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-662016/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 662959 — **Prep Batch: 662016**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.02553	U	0.303	0.303	1.00	0.568	pCi/L	05/16/24 09:27	05/22/24 16:21	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.3*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:21*	*1*
Y Carrier	*81.9*		*30 - 110*	*05/16/24 09:27*	*05/22/24 16:21*	*1*

Lab Sample ID: LCS 160-662016/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 662959 — **Prep Batch: 662016**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.92	10.45		1.39	1.00	0.473	pCi/L	117	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*89.6*		*30 - 110*
Y Carrier	*81.5*		*30 - 110*

QC Association Summary

Client: TRC Environmental Corporation.
Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Rad

Prep Batch: 662015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204358-1	MW-15002	Total/NA	Water	PrecSep STD	
240-204358-2	MW-15008	Total/NA	Water	PrecSep STD	
240-204358-3	MW-15016	Total/NA	Water	PrecSep STD	
240-204358-4	MW-15019	Total/NA	Water	PrecSep STD	
240-204358-5	DUP-BACKGROUND	Total/NA	Water	PrecSep STD	
240-204358-6	EQ-BACKGROUND	Total/NA	Water	PrecSep STD	
MB 160-662015/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-662015/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	

Prep Batch: 662016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204358-1	MW-15002	Total/NA	Water	PrecSep_0	
240-204358-2	MW-15008	Total/NA	Water	PrecSep_0	
240-204358-3	MW-15016	Total/NA	Water	PrecSep_0	
240-204358-4	MW-15019	Total/NA	Water	PrecSep_0	
240-204358-5	DUP-BACKGROUND	Total/NA	Water	PrecSep_0	
240-204358-6	EQ-BACKGROUND	Total/NA	Water	PrecSep_0	
MB 160-662016/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-662016/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: MW-15002 Lab Sample ID: 240-204358-1

Date Collected: 05/08/24 14:51 **Matrix: Water**
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662015	MLT	EET SL	05/16/24 09:22
Total/NA	Analysis	903.0		1	665824	SWS	EET SL	06/12/24 10:00
Total/NA	Prep	PrecSep_0			662016	MLT	EET SL	05/16/24 09:27
Total/NA	Analysis	904.0		1	662959	SCB	EET SL	05/22/24 16:22
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:50

Client Sample ID: MW-15008 Lab Sample ID: 240-204358-2

Date Collected: 05/08/24 13:15 **Matrix: Water**
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662015	MLT	EET SL	05/16/24 09:22
Total/NA	Analysis	903.0		1	665824	SWS	EET SL	06/12/24 10:00
Total/NA	Prep	PrecSep_0			662016	MLT	EET SL	05/16/24 09:27
Total/NA	Analysis	904.0		1	662959	SCB	EET SL	05/22/24 16:22
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:50

Client Sample ID: MW-15016 Lab Sample ID: 240-204358-3

Date Collected: 05/08/24 14:57 **Matrix: Water**
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662015	MLT	EET SL	05/16/24 09:22
Total/NA	Analysis	903.0		1	665824	SWS	EET SL	06/12/24 10:00
Total/NA	Prep	PrecSep_0			662016	MLT	EET SL	05/16/24 09:27
Total/NA	Analysis	904.0		1	662959	SCB	EET SL	05/22/24 16:22
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:50

Client Sample ID: MW-15019 Lab Sample ID: 240-204358-4

Date Collected: 05/08/24 14:13 **Matrix: Water**
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662015	MLT	EET SL	05/16/24 09:22
Total/NA	Analysis	903.0		1	665824	SWS	EET SL	06/12/24 10:00
Total/NA	Prep	PrecSep_0			662016	MLT	EET SL	05/16/24 09:27
Total/NA	Analysis	904.0		1	662959	SCB	EET SL	05/22/24 16:22
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:50

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: DUP-BACKGROUND — Lab Sample ID: 240-204358-5

Date Collected: 05/08/24 00:00 — **Matrix: Water**
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662015	MLT	EET SL	05/16/24 09:22
Total/NA	Analysis	903.0		1	665832	SWS	EET SL	06/12/24 10:06
Total/NA	Prep	PrecSep_0			662016	MLT	EET SL	05/16/24 09:27
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:39
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:50

Client Sample ID: EQ-BACKGROUND — Lab Sample ID: 240-204358-6

Date Collected: 05/08/24 16:05 — **Matrix: Water**
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662015	MLT	EET SL	05/16/24 09:22
Total/NA	Analysis	903.0		1	665832	SWS	EET SL	06/12/24 10:06
Total/NA	Prep	PrecSep_0			662016	MLT	EET SL	05/16/24 09:27
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:39
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:50

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-204358-1
Project/Site: Karn/Weadock CCR Background Well

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-24
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	10-31-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing

Client Information	Sampler: Javier Jasso	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-120140-33282.1
Client Contact: Jacob Krenz	Phone: 734 904 3710	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes: D - HNO3
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #:			Other:
Project Name: Karn/Weadock CCR Background Well	Project #: 24024154			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
MW-15002	5/8/24	1451	G	Water	N	N	X	X	2	
MW-15008	5/8/24	1315	G	Water	N	N	X	X	2	
MW-15016	5/8/24	1457	G	Water	N	N	X	X	2	
MW-15019	5/8/24	1413	G	Water	N	N	X	X	2	
DUP-Background	5/8/24	—	G	Water	N	N	X	X	2	
EQ-Backgroud	5/8/24	1405	G	Water	N	N	X	X	2	
				Water						

240-204358 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		5/10/24 0815			5/10/24	FEXA
2		5/10/24 0815	FEXA	JESSE MOROSKO	05/11/24 0815	FEXA
3						

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

Cooler Temperature(s) °C and Other Remarks: —

Eurofins – Cleveland Sample Receipt Form/Narrative Login # :
Barberton Facility

Client TRC Site Name

Cooler unpacked by: JESSE MOROSKO

Cooler Received on 05/11/24 Opened on 05/11/24

FedEx. 1st Grd Exp UPS FAS Waypoint Client Drop Off Eurofins Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

Eurofins Cooler # EC Foam Box Client Cooler Box Other

Packing material used Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt [X] See Multiple Cooler Form

IR GUN # 18 (CF 1.0 °C) Observed Cooler Temp. °C Corrected Cooler Temp °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes No
	-Were tamper/custody seals intact and uncompromised?	Yes No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes No
4.	Did custody papers accompany the sample(s)?	Yes No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes No
6.	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes No
7	Did all bottles arrive in good condition (Unbroken)?	Yes No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10	Were correct bottle(s) used for the test(s) indicated?	Yes No
11	Sufficient quantity received to perform indicated analyses?	Yes No
12.	Are these work share samples and all listed on the COC?	Yes No
	If yes, Questions 13-17 have been checked at the originating laboratory	
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes No NA pH Strip Lot# HC439975
14.	Were VOAs on the COC?	Yes No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes No NA
16.	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes No
17	Was a LL Hg or Me Hg trip blank present?	Yes No

Tests that are not checked for pH by Receiving.

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19 SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container
Sample(s) were received with bubble >6 mm in diameter (Notify PM)

20 SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory
Time preserved Preservative(s) added/Lot number(s)

VOA Sample Preservation Date/Time VOAs Frozen.

Login # ____________

Eurofins - Cleveland Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
EC Client Box Other	IR GUN #: 18	1.7	1.7	Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: 18	3.4	3.4	Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: 18	3.9	3.9	Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #: ______			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

5/11/2024

Login Container Summary Report

240-204358

6/14/2024

Temperature readings _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservation Added	Preservation Lot Number
MW 15002	240-204358 A-1	Plastic 1 liter - Nitric Acid	<2			
MW-15002	240-204358-B-1	Plastic 1 liter - Nitric Acid	<2			
MW-15008	240-204358-A-2	Plastic 1 liter - Nitric Acid	<2			
MW-15008	240-204358-B-2	Plastic 1 liter - Nitric Acid	<2			
MW-15016	240-204358 A-3	Plastic 1 liter - Nitric Acid	<2			
MW-15016	240-204358-B-3	Plastic 1 liter - Nitric Acid	<2			
MW 15019	240 204358-A-4	Plastic 1 liter - Nitric Acid	<2			
MW-15019	240-204358-B-4	Plastic 1 liter - Nitric Acid	<2			
DUP-BACKGROUND	240-204358-A-5	Plastic 1 liter - Nitric Acid	<2			
DUP-BACKGROUND	240-204358-B-5	Plastic 1 liter - Nitric Acid	<2			
EQ-BACKGROUND	240-204358-A-6	Plastic 1 liter - Nitric Acid	<2			
EQ-BACKGROUND	240-204358-B-6	Plastic 1 liter - Nitric Acid	<2			

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-184582.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-204358-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/12/2024			Preservation Codes: -
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Karn/Weadock CCR Background Well	Project #: 24024154			Other:
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-15002 (240-204358-1)	5/8/24	14:51 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-15008 (240-204358-2)	5/8/24	13:15 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-15016 (240-204358-3)	5/8/24	14:57 Eastern		Water			X	X	X	1	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-15019 (240-204358-4)	5/8/24	14:13 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
DUP-BACKGROUND (240-204358-5)	5/8/24	Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
EQ-BACKGROUND (240-204358-6)	5/8/24	16:05 Eastern		Water			X	X	X	1	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

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	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by: MALISSA LOAR					
	Relinquished by:	Date/Time:	Company	Received by: M. Pinette	Date/Time: MAY 14 2024 0950	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:

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-204358-1

Login Number: 204358
List Number: 2
Creator: Thornley, Richard W

List Source: Eurofins St. Louis
List Creation: 05/14/24 05:18 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.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
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	

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-204358-1

Login Number: 204358
List Number: 3
Creator: Thornley, Richard W

List Source: Eurofins St. Louis
List Creation: 05/15/24 08:08 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
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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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: May 29, 2024

Subject: HMP GROUNDWATER MONITORING – JCW POREWATER – 2024 Q2

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0344R

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site during the week of 05/06/2024 for the 2nd Quarter requirements, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 05/10/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, latest edition.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q2-2024 Weadock Porewater Wells
Date Received: 5/10/2024
Chemistry Project: 24-0344

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0344-01	JCW-MW-18001	Groundwater	05/07/2024 06:20	JCW Solid Waste Disposal Area, Porewater
24-0344-02	JCW-MW-18004	Groundwater	05/08/2024 08:08	JCW Solid Waste Disposal Area, Porewater
24-0344-03	JCW-MW-18005	Groundwater	05/08/2024 09:02	JCW Solid Waste Disposal Area, Porewater
24-0344-04	JCW-MW-18006	Groundwater	05/08/2024 10:55	JCW Solid Waste Disposal Area, Porewater
24-0344-05	MW-50	Groundwater	05/07/2024 08:07	JCW Solid Waste Disposal Area, Porewater
24-0344-06	MW-51	Groundwater	05/07/2024 09:20	JCW Solid Waste Disposal Area, Porewater
24-0344-07	MW-52	Groundwater	05/07/2024 10:21	JCW Solid Waste Disposal Area, Porewater
24-0344-08	MW-53	Groundwater	05/07/2024 11:30	JCW Solid Waste Disposal Area, Porewater
24-0344-09	MW-53R	Groundwater	05/07/2024 12:27	JCW Solid Waste Disposal Area, Porewater
24-0344-10	MW-54R	Groundwater	05/07/2024 13:25	JCW Solid Waste Disposal Area, Porewater
24-0344-11	MW-55	Groundwater	05/08/2024 07:12	JCW Solid Waste Disposal Area, Porewater
24-0344-12	OW-57ROUT	Groundwater	05/08/2024 09:47	JCW Solid Waste Disposal Area, Porewater
24-0344-13	MW-58	Groundwater	05/08/2024 11:51	JCW Solid Waste Disposal Area, Porewater
24-0344-14	DUP-JCW-LF-01	Groundwater	05/07/2024 00:00	JCW Solid Waste Disposal Area, Porewater
24-0344-15	DUP-JCW-LF-02	Groundwater	05/08/2024 00:00	JCW Solid Waste Disposal Area, Porewater
24-0344-16	JCW-MW-18001 MS	Groundwater	05/07/2024 06:20	JCW Solid Waste Disposal Area, Porewater
24-0344-17	JCW-MW-18001 MSD	Groundwater	05/07/2024 06:20	JCW Solid Waste Disposal Area, Porewater
24-0344-18	FB-01	Water	05/08/2024 12:15	JCW Solid Waste Disposal Area, Porewater
24-0344-19	EB-01	Water	05/07/2024 12:20	JCW Solid Waste Disposal Area, Porewater

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18001**
Lab Sample ID: 24-0344-01
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 06:20 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	2		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	46		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	1330		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	537000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	4		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	2630		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	102		ug/L	10.0	05/16/2024	AB24-0516-03
Magnesium	133000		ug/L	1000.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	4		ug/L	2.0	05/16/2024	AB24-0516-03
Potassium	16100		ug/L	100.0	05/16/2024	AB24-0516-03
Selenium	2		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	238000		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	2		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-01-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	44500		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	1790000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	3370		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18001**
Lab Sample ID: 24-0344-01
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 06:20 AM

Alkalinity by SM 2320B

Aliquot #: 24-0344-01-C04-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	723000		ug/L	10000.0	05/15/2024	AB24-0515-04
Alkalinity Bicarbonate	723000		ug/L	10000.0	05/15/2024	AB24-0515-04
Alkalinity Carbonate	ND		ug/L	10000.0	05/15/2024	AB24-0515-04

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18004**
Lab Sample ID: 24-0344-02
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 08:08 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	26		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	206		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	213000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	73		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	43		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	4		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	22400		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-02-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-02-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	14300		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	484000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-02-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1130		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18005**
Lab Sample ID: 24-0344-03
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 09:02 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	4		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	127		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	960		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	302000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	6550		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	41		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	14300		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-03-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-03-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	22100		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	475000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-03-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1390		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **JCW-MW-18006**
Lab Sample ID: 24-0344-04
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 10:55 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	29		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	390		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	2740		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	148000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	1		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	10400		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	59		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	6		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	84000		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	3		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-04-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-04-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	49200		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	122000		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-04-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	864		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-50**
Lab Sample ID: 24-0344-05
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 08:07 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	3		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	176		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	2070		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	184000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	834		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	61		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	5		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	1		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	56500		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-05-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-05-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	37100		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	425000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-05-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1250		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-51**
Lab Sample ID: 24-0344-06
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 09:20 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	13		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	117		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	798		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	128000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	1		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	760		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	28		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	3		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	99700		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	2		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-06-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-06-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	79900		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	262000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-06-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	958		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-52**
Lab Sample ID: 24-0344-07
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 10:21 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	91		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	895		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	236000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	3680		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	29		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	1		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	51200		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-07-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-07-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	33300		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	550000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-07-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1430		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-53**
Lab Sample ID: 24-0344-08
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 11:30 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	1		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	582		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	6110		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	134000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	665		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	50		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	2		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	63300		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-08-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-08-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	89300		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	1530		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-08-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	942		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-53R**
Lab Sample ID: 24-0344-09
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 12:27 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	10		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	164		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	2200		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	166000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	1		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	761		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	1		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	53		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	1		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	53700		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-09-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-09-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	32500		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	47600		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-09-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	880		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-54R**
Lab Sample ID: 24-0344-10
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 01:25 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	1		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	83		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	5580		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	161000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	3		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	87		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	73		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	18		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	2		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	29900		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-10-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-10-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	56900		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	51300		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-10-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	792		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-55**
Lab Sample ID: 24-0344-11
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 07:12 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-11-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	39		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	235		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	729		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	161000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	1		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	14700		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	26		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	25		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	6		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	4		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	82300		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-11-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-11-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	17300		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	236000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-11-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	934		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **OW-57ROUT**
Lab Sample ID: 24-0344-12
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 09:47 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-12-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	1		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	75		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	1700		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	119000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	94		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	26		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	6		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	15		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	1		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	59900		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-12-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-12-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	72300		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	1090		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	77600		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-12-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	790		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **MW-58**
Lab Sample ID: 24-0344-13
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 11:51 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-13-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	156		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	114		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	115000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	1		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	16800		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	23		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	5		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	355000		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	9		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-13-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-13-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	638000		ug/L	1000.0	05/20/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	10900		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-13-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1540		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **DUP-JCW-LF-01**
Lab Sample ID: 24-0344-14
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-14-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	3		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	180		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	2020		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	191000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	817		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	62		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	5		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	2		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	57700		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-14-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-14-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	38100		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	421000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-14-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1160		mg/L	10.0	05/10/2024	AB24-0510-09

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **DUP-JCW-LF-02**
Lab Sample ID: 24-0344-15
Matrix: Groundwater

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-15-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	29		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	387		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	2830		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	150000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	1		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	10800		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	61		ug/L	10.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	6		ug/L	2.0	05/16/2024	AB24-0516-03
Selenium	1		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	85400		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	3		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-15-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-15-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	52000		ug/L	1000.0	05/15/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/15/2024	AB24-0514-08
Sulfate	129000		ug/L	1000.0	05/15/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0344-15-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	878		mg/L	10.0	05/10/2024	AB24-0510-09

Sample Site:	**JCW Solid Waste Disposal Area, Porewater (395457)**	Laboratory Project:	**24-0344**
Field Sample ID:	**JCW-MW-18001 MS**	Collect Date:	05/07/2024
Lab Sample ID:	24-0344-16	Collect Time:	06:20 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-16-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	106		%	1.0	05/16/2024	AB24-0516-03
Arsenic	107		%	1.0	05/16/2024	AB24-0516-03
Barium	103		%	5.0	05/16/2024	AB24-0516-03
Beryllium	91		%	1.0	05/16/2024	AB24-0516-03
Boron	110		%	20.0	05/16/2024	AB24-0516-03
Cadmium	103		%	0.2	05/16/2024	AB24-0516-03
Calcium	115		%	1000.0	05/16/2024	AB24-0516-03
Chromium	104		%	1.0	05/16/2024	AB24-0516-03
Cobalt	100		%	6.0	05/16/2024	AB24-0516-03
Copper	92		%	1.0	05/16/2024	AB24-0516-03
Iron	116		%	20.0	05/16/2024	AB24-0516-03
Lead	97		%	1.0	05/16/2024	AB24-0516-03
Lithium	91		%	10.0	05/16/2024	AB24-0516-03
Magnesium	108		%	1000.0	05/16/2024	AB24-0516-03
Molybdenum	113		%	5.0	05/16/2024	AB24-0516-03
Nickel	98		%	2.0	05/16/2024	AB24-0516-03
Potassium	106		%	100.0	05/16/2024	AB24-0516-03
Selenium	109		%	1.0	05/16/2024	AB24-0516-03
Silver	98.0		%	0.2	05/16/2024	AB24-0516-03
Sodium	114		%	1000.0	05/16/2024	AB24-0516-03
Thallium	97		%	2.0	05/16/2024	AB24-0516-03
Vanadium	109		%	2.0	05/16/2024	AB24-0516-03
Zinc	97		%	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-16-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	97.0		%	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-16-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	105		%	1000.0	05/16/2024	AB24-0514-08
Fluoride	95		%	1000.0	05/16/2024	AB24-0514-08
Sulfate	112		%	1000.0	05/16/2024	AB24-0514-08

Sample Site:	**JCW Solid Waste Disposal Area, Porewater (395457)**	Laboratory Project:	**24-0344**
Field Sample ID:	**JCW-MW-18001 MSD**	Collect Date:	05/07/2024
Lab Sample ID:	24-0344-17	Collect Time:	06:20 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-17-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	105		%	1.0	05/16/2024	AB24-0516-03
Arsenic	107		%	1.0	05/16/2024	AB24-0516-03
Barium	102		%	5.0	05/16/2024	AB24-0516-03
Beryllium	90		%	1.0	05/16/2024	AB24-0516-03
Boron	111		%	20.0	05/16/2024	AB24-0516-03
Cadmium	102		%	0.2	05/16/2024	AB24-0516-03
Calcium	110		%	1000.0	05/16/2024	AB24-0516-03
Chromium	106		%	1.0	05/16/2024	AB24-0516-03
Cobalt	102		%	6.0	05/16/2024	AB24-0516-03
Copper	93		%	1.0	05/16/2024	AB24-0516-03
Iron	111		%	20.0	05/16/2024	AB24-0516-03
Lead	96		%	1.0	05/16/2024	AB24-0516-03
Lithium	90		%	10.0	05/16/2024	AB24-0516-03
Magnesium	106		%	1000.0	05/16/2024	AB24-0516-03
Molybdenum	113		%	5.0	05/16/2024	AB24-0516-03
Nickel	99		%	2.0	05/16/2024	AB24-0516-03
Potassium	104		%	100.0	05/16/2024	AB24-0516-03
Selenium	108		%	1.0	05/16/2024	AB24-0516-03
Silver	96.2		%	0.2	05/16/2024	AB24-0516-03
Sodium	113		%	1000.0	05/16/2024	AB24-0516-03
Thallium	97		%	2.0	05/16/2024	AB24-0516-03
Vanadium	110		%	2.0	05/16/2024	AB24-0516-03
Zinc	97		%	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-17-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	96.0		%	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-17-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	102		%	1000.0	05/16/2024	AB24-0514-08
Fluoride	95		%	1000.0	05/16/2024	AB24-0514-08
Sulfate	114		%	1000.0	05/16/2024	AB24-0514-08

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **FB-01**
Lab Sample ID: 24-0344-18
Matrix: Water

Laboratory Project: **24-0344**
Collect Date: 05/08/2024
Collect Time: 12:15 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-18-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	ND		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	ND		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	ND		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	ND		ug/L	10.0	05/16/2024	AB24-0516-03
Magnesium	ND		ug/L	1000.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Potassium	ND		ug/L	100.0	05/16/2024	AB24-0516-03
Selenium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	ND		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-18-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-18-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/16/2024	AB24-0514-08
Sulfate	ND		ug/L	1000.0	05/16/2024	AB24-0514-08

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Analytical Report

Report Date: 05/29/24

Sample Site: **JCW Solid Waste Disposal Area, Porewater (395457)**
Field Sample ID: **EB-01**
Lab Sample ID: 24-0344-19
Matrix: Water

Laboratory Project: **24-0344**
Collect Date: 05/07/2024
Collect Time: 12:20 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0344-19-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	ND		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	ND		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	3		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	ND		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	ND		ug/L	10.0	05/16/2024	AB24-0516-03
Magnesium	ND		ug/L	1000.0	05/16/2024	AB24-0516-03
Molybdenum	ND		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Potassium	ND		ug/L	100.0	05/16/2024	AB24-0516-03
Selenium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	ND		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0344-19-C01-A03 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/16/2024	AB24-0516-09

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0344-19-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/16/2024	AB24-0514-08
Sulfate	ND		ug/L	1000.0	05/16/2024	AB24-0514-08

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0344

Inspection Date: 05/10/24 **Inspection By:** CLE

Sample Origin/Project Name: JCW Porewater

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/~~Hand Carry~~ (whom) TRC

Tracking Number: _____ Shipping Form Attached: Yes _____ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 2.1-4.2°C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015402 5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or (60mL))	2				
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	38				
24 mL vial (glass)					
250 ~~500~~ mL (plastic)	15				
Other _____					

FSP
PH 0-14
13.1640-508
Cot: 205522
EXP: 2.16.25

PG. 2&2 not needed

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q2-2024 JC Weadock Porewater Wells

PROJECT NUMBER: **24-0344**

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	Alkalinity	REMARKS
24-0344-01	5/7/24	0620	GW	JCW-MW-18001	5	4	1						x	x	x	x	
-02	5/8/24	0808	GW	JCW-MW-18004	3	2	1						x	x	x		
-03	5/8/24	0903	GW	JCW-MW-18005	3	2	1						x	x	x		
-04	5/8/24	DUP	GW	JCW-MW-18006	3	2	1						x	x	x		
-05	5/7/24	0807	GW	MW-50	3	2	1						x	x	x		
-06	5/7/24	0932	GW	MW-51	3	2	1						x	x	x		
-07	5/7/24	1021	GW	MW-52	3	2	1						x	x	x		
-08	5/7/24	1130	GW	MW-53	3	2	1						x	x	x		
-09	5/7/24	1227	GW	MW-53R	3	2	1						x	x	x		
-10	5/7/24	1321	GW	MW-54R	3	2	1						x	x	x		
-11	5/8/24	0713	GW	MW-55	3	2	1						x	x	x		
-12	5/8/24	0947	GW	OW-57ROUT	3	2	1						x	x	x		

RELINQUISHED BY: — DATE/TIME: 5/10/24 0700 — RECEIVED BY:

RELINQUISHED BY: — DATE/TIME: — RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No — M&TE #: 015402

Temperature: 2.1 - 4.2 °C — Cal. Due Date: 5-23-24

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135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q2-2024 JC Weadock Porewater Wells	PROJECT NUMBER: 24-0344	SAP CC or WO#:	ANALYSIS REQUESTED (Attach List if More Space is Needed)
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register / TRC	MATRIX CODES: GW = Groundwater, WW = Wastewater, W = Water / Aqueous Liquid, S = Soil / General Solid, O = Oil, OX = Other _____, SL = Sludge, A = Air, WP = Wipe, WT = General Waste		

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	Alkalinity	REMARKS
24-0344-13	5/8/24	1151	GW	MW-58	3	2	1						x	x	x		
-14	5/7/24	—	GW	DUP-JCW-LF-01	3	2	1						x	x	x		
-15	5/8/24	—	GW	DUP-JCW-LF-02	3	2	1						x	x	x		
-16	5/7/24	0602	GW	JCW-MW-18001 MS	2	1	1						x	x			
-17	5/7/24	0602	GW	JCW-MW-18001 MSD	2	1	1						x	x			
-18	5/8/24	1215	W	FB-01	2	1	1						x	x			
-19	5/8/24	1220	W	EB-01	2	1	1						x	x			

RELINQUISHED BY: _____ DATE/TIME: 5/10/24 0710 RECEIVED BY: _____

RELINQUISHED BY: _____ DATE/TIME: _____ RECEIVED BY: _____

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015902

Temperature: 2.1-4.2 °C Cal. Due Date: 5-23-24

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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: May 23, 2024

Subject: HMP GROUNDWATER MONITORING – JCWEADOCK ASD – 2024 Q2

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 24-0345

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site during the week of 05/06/2024 for the 2nd Quarter requirements, as specified in the Hydrogeological Monitoring Plan for the site. The sample was received for analysis by the Chemistry department of Laboratory Services on 05/10/2024.

The report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative, or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, latest edition.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI Analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q2-2024 Weadock ASD
Date Received: 5/10/2024
Chemistry Project: 24-0345

Sample #	Field Sample ID	Matrix	Sample Date	Site
24-0345-01	JCW-OW-18001	Groundwater	05/07/2024 07:20	JC Weadock ASD

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Analytical Report

Report Date: 05/23/24

Sample Site: **JC Weadock ASD**
Field Sample ID: **JCW-OW-18001**
Lab Sample ID: 24-0345-01
Matrix: Groundwater

Laboratory Project: **24-0345**
Collect Date: 05/07/2024
Collect Time: 07:20 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 24-0345-01-C01-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/20/2024	AB24-0515-05

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 24-0345-01-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Arsenic	166		ug/L	1.0	05/16/2024	AB24-0516-03
Barium	79		ug/L	5.0	05/16/2024	AB24-0516-03
Beryllium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Boron	1550		ug/L	20.0	05/16/2024	AB24-0516-03
Cadmium	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Calcium	230000		ug/L	1000.0	05/16/2024	AB24-0516-03
Chromium	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Cobalt	ND		ug/L	6.0	05/16/2024	AB24-0516-03
Copper	2		ug/L	1.0	05/16/2024	AB24-0516-03
Iron	11800		ug/L	20.0	05/16/2024	AB24-0516-03
Lead	ND		ug/L	1.0	05/16/2024	AB24-0516-03
Lithium	59		ug/L	10.0	05/16/2024	AB24-0516-03
Magnesium	50700		ug/L	1000.0	05/16/2024	AB24-0516-03
Molybdenum	6		ug/L	5.0	05/16/2024	AB24-0516-03
Nickel	4		ug/L	2.0	05/16/2024	AB24-0516-03
Potassium	10900		ug/L	100.0	05/16/2024	AB24-0516-03
Selenium	2		ug/L	1.0	05/16/2024	AB24-0516-03
Silver	ND		ug/L	0.2	05/16/2024	AB24-0516-03
Sodium	63500		ug/L	1000.0	05/16/2024	AB24-0516-03
Thallium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Vanadium	ND		ug/L	2.0	05/16/2024	AB24-0516-03
Zinc	ND		ug/L	10.0	05/16/2024	AB24-0516-03

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 24-0345-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	60200		ug/L	1000.0	05/16/2024	AB24-0514-08
Fluoride	ND		ug/L	1000.0	05/16/2024	AB24-0514-08
Sulfate	524000		ug/L	1000.0	05/16/2024	AB24-0514-08

Total Dissolved Solids by SM 2540C

Aliquot #: 24-0345-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1370		mg/L	10.0	05/10/2024	AB24-0510-10

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Analytical Report

Report Date: 05/23/24

Sample Site: **JC Weadock ASD**
Field Sample ID: **JCW-OW-18001**
Lab Sample ID: 24-0345-01
Matrix: Groundwater

Laboratory Project: **24-0345**
Collect Date: 05/07/2024
Collect Time: 07:20 AM

Alkalinity by SM 2320B

Aliquot #: 24-0345-01-C04-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	384000		ug/L	10000.0	05/15/2024	AB24-0515-04
Alkalinity Bicarbonate	384000		ug/L	10000.0	05/15/2024	AB24-0515-04
Alkalinity Carbonate	ND		ug/L	10000.0	05/15/2024	AB24-0515-04

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 24-0345

Inspection Date: 5/10/24 **Inspection By:** CLE

Sample Origin/Project Name: JCW ASD

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/(Hand Carry) (whom) TRC

Tracking Number:_____ Shipping Form Attached: Yes _____ No ____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box_____ Custom Case _____ Envelope/Mailer ____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet_____ Other_____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 2.3°C Samples Received on Ice: Yes ✓ No____

M&TE # and Expiration 015402
5.23.24

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	2				
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	2				
24 mL vial (glass)					
250 500 mL (plastic)	1				
Other					

FSP 0-14
#13-640-508
lot: 205522
exp: 2-15-25

PG. 2 02 not needed

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q4-2024 JC Weadock ASD	PROJECT NUMBER: 24-0345	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	
SEND REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register / TRC	MATRIX CODES: GW = Groundwater, WW = Wastewater, W = Water / Aqueous Liquid, S = Soil / General Solid, O = Oil, OX = Other _____, SL = Sludge, A = Air, WP = Wipe, WT = General Waste		

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT:

☐ NPDES
☒ TNI
☐ ISO 17025
☐ 10 CFR 50 APP. B
☐ INTERNAL INFO
☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	Alkalinity	REMARKS
24-0345-01	5/7/24	0730	GW	JCW-OW-18001	5	4	1						x	x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 5/10/24 0702 RECEIVED BY: [signature]

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015402

Temperature: 2.3 °C Cal. Due Date: 5-23-24

ANALYTICAL REPORT

PREPARED FOR

Attn: Darby Litz
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Generated 6/14/2024 11:08:52 AM

JOB DESCRIPTION

Karn/Weadock CCR JCW Landfill

JOB NUMBER

240-204359-1

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

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

Generated
6/14/2024 11:08:52 AM

Authorized for release by
Kris Brooks, Project Manager II
Kris.Brooks@et.eurofinsus.com
(330)966-9790

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-204359-1
Project/Site: Karn/Weadock CCR JCW Landfill

Qualifiers

Rad

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

Glossary

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

Job ID: 240-204359-1 Eurofins Cleveland

Job Narrative
240-204359-1

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 5/11/2024 8:00 AM. 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 1.7°C, 3.4°C and 3.9°C.

Receipt Exceptions
The number of containers listed on the COC pages do not match what was received for the following: JCW-MW-18001 (240-204359-1), JCW-MW-18006 (240-204359-4), MW-50 (240-204359-5), MW-51 (240-204359-6), MW-52 (240-204359-7), DUP-02 (240-204359-15) and MW-58 (240-204359-16). There is sufficient volume for the requested analyses.

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

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

Method Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Job ID: 240-204359-1
Project/Site: Karn/Weadock CCR JCW Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-204359-1	JCW-MW-18001	Water	05/07/24 06:00	05/11/24 08:00
240-204359-2	JCW-MW-18004	Water	05/08/24 06:08	05/11/24 08:00
240-204359-3	JCW-MW-18005	Water	05/08/24 09:02	05/11/24 08:00
240-204359-5	MW-50	Water	05/07/24 08:07	05/11/24 08:00
240-204359-6	MW-51	Water	05/07/24 09:20	05/11/24 08:00
240-204359-7	MW-52	Water	05/07/24 10:21	05/11/24 08:00
240-204359-8	MW-53	Water	05/07/24 11:20	05/11/24 08:00
240-204359-9	MW-53R	Water	05/07/24 12:27	05/11/24 08:00
240-204359-10	MW-54R	Water	05/07/24 12:25	05/11/24 08:00
240-204359-11	MW-55	Water	05/08/24 07:12	05/11/24 08:00
240-204359-12	OW-57ROUT	Water	05/08/24 09:47	05/11/24 08:00
240-204359-13	DUP-01	Water	05/07/24 00:00	05/11/24 08:00
240-204359-14	EB-1	Water	05/08/24 12:20	05/11/24 08:00
240-204359-15	DUP-02	Water	05/08/24 00:00	05/11/24 08:00
240-204359-16	MW-58	Water	05/08/24 11:51	05/11/24 08:00

Client Sample ID: JCW-MW-18001

Date Collected: 05/07/24 06:00
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-1

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.124**		0.0697	0.0706	1.00	0.0883	pCi/L	05/16/24 09:14	06/12/24 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*30 - 110*	*05/16/24 09:14*	*06/12/24 07:48*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.400	U	0.326	0.328	1.00	0.506	pCi/L	05/16/24 09:20	05/22/24 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*
Y Carrier	*81.9*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.525**		0.333	0.336	5.00	0.506	pCi/L		06/13/24 11:27	1

Client Sample ID: JCW-MW-18004 — Lab Sample ID: 240-204359-2

Date Collected: 05/08/24 06:08 — **Matrix: Water**
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0313	U	0.0576	0.0576	1.00	0.102	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.402	U	0.415	0.417	1.00	0.672	pCi/L	05/16/24 09:20	05/22/24 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*
Y Carrier	*78.1*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.434	U	0.419	0.421	5.00	0.672	pCi/L		06/13/24 11:27	1

Client Sample ID: JCW-MW-18005
Lab Sample ID: 240-204359-3

Date Collected: 05/08/24 09:02
Matrix: Water
Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.165		0.0869	0.0881	1.00	0.106	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.4*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.07		0.487	0.497	1.00	0.643	pCi/L	05/16/24 09:20	05/22/24 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.4*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*
Y Carrier	*77.4*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.23		0.495	0.505	5.00	0.643	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-50

Date Collected: 05/07/24 08:07
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-5

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.270		0.0980	0.101	1.00	0.102	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.3*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.20		0.429	0.443	1.00	0.512	pCi/L	05/16/24 09:20	05/22/24 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.3*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*
Y Carrier	*81.5*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.47		0.440	0.454	5.00	0.512	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-51
Date Collected: 05/07/24 09:20
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-6
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.181		0.0812	0.0828	1.00	0.0916	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.8*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.681		0.366	0.371	1.00	0.509	pCi/L	05/16/24 09:20	05/22/24 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.8*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*
Y Carrier	*81.5*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.863		0.375	0.380	5.00	0.509	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-52

Date Collected: 05/07/24 10:21
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-7

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.162		0.0853	0.0866	1.00	0.110	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.3*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.03		0.462	0.471	1.00	0.631	pCi/L	05/16/24 09:20	05/22/24 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.3*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*
Y Carrier	*82.6*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.19		0.470	0.479	5.00	0.631	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-53

Date Collected: 05/07/24 11:20
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-8

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.561		0.131	0.140	1.00	0.0930	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.25		0.447	0.461	1.00	0.543	pCi/L	05/16/24 09:20	05/22/24 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*
Y Carrier	*83.7*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.81		0.466	0.482	5.00	0.543	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-53R

Date Collected: 05/07/24 12:27
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-9

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.155**		0.0763	0.0775	1.00	0.0852	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.8*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.518	U	0.375	0.378	1.00	0.567	pCi/L	05/16/24 09:20	05/22/24 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.8*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*
Y Carrier	*81.1*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.674**		0.383	0.386	5.00	0.567	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-54R
Date Collected: 05/07/24 12:25
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-10
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.180		0.0842	0.0858	1.00	0.0916	pCi/L	05/16/24 09:14	06/12/24 10:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.9*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:06*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.184	U	0.476	0.476	1.00	0.829	pCi/L	05/16/24 09:20	05/22/24 16:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.9*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*
Y Carrier	*81.1*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:46*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.364	U	0.483	0.484	5.00	0.829	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-55
Date Collected: 05/08/24 07:12
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-11
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.137		0.0722	0.0733	1.00	0.0875	pCi/L	05/16/24 09:14	06/12/24 10:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.3*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:06*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.971		0.419	0.428	1.00	0.550	pCi/L	05/16/24 09:20	05/22/24 16:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.3*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*
Y Carrier	*80.0*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.11		0.425	0.434	5.00	0.550	pCi/L		06/13/24 11:27	1

Client Sample ID: OW-57ROUT

Date Collected: 05/08/24 09:47
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-12

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.115		0.0784	0.0791	1.00	0.109	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.731		0.434	0.439	1.00	0.636	pCi/L	05/16/24 09:20	05/22/24 16:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.1*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*
Y Carrier	*77.8*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.845		0.441	0.446	5.00	0.636	pCi/L		06/13/24 11:27	1

Client Sample ID: DUP-01

Date Collected: 05/07/24 00:00
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-13

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.349		0.102	0.107	1.00	0.0800	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.8*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.03		0.410	0.421	1.00	0.527	pCi/L	05/16/24 09:20	05/22/24 16:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.8*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*
Y Carrier	*84.9*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.38		0.422	0.434	5.00	0.527	pCi/L		06/13/24 11:27	1

Client Sample ID: EB-1
Date Collected: 05/08/24 12:20
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-14
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0331	U	0.0591	0.0592	1.00	0.129	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.6*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0161	U	0.289	0.289	1.00	0.539	pCi/L	05/16/24 09:20	05/22/24 16:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.6*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*
Y Carrier	*83.0*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0170	U	0.295	0.295	5.00	0.539	pCi/L		06/13/24 11:27	1

Client Sample ID: DUP-02
Date Collected: 05/08/24 00:00
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-15
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.280		0.106	0.109	1.00	0.118	pCi/L	05/16/24 09:14	06/12/24 10:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.0*		*30 - 110*	*05/16/24 09:14*	*06/12/24 10:05*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0881	U	0.294	0.295	1.00	0.528	pCi/L	05/16/24 09:20	05/22/24 16:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.0*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*
Y Carrier	*83.4*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.368	U	0.313	0.314	5.00	0.528	pCi/L		06/13/24 11:27	1

Client Sample ID: MW-58

Date Collected: 05/08/24 11:51
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-16

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.591		0.137	0.147	1.00	0.109	pCi/L	05/16/24 09:14	06/12/24 09:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.8*		*30 - 110*	*05/16/24 09:14*	*06/12/24 09:57*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.777		0.452	0.458	1.00	0.658	pCi/L	05/16/24 09:20	05/22/24 16:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.8*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*
Y Carrier	*80.4*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:43*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.37		0.472	0.481	5.00	0.658	pCi/L		06/13/24 11:27	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.
Job ID: 240-204359-1
Project/Site: Karn/Weadock CCR JCW Landfill

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
240-204359-1	JCW-MW-18001	96.8
240-204359-2	JCW-MW-18004	85.1
240-204359-3	JCW-MW-18005	76.4
240-204359-5	MW-50	93.3
240-204359-6	MW-51	95.8
240-204359-7	MW-52	90.3
240-204359-8	MW-53	88.1
240-204359-9	MW-53R	86.8
240-204359-10	MW-54R	77.9
240-204359-10 DU	MW-54R	91.3
240-204359-11	MW-55	90.3
240-204359-12	OW-57ROUT	88.1
240-204359-13	DUP-01	91.8
240-204359-14	EB-1	88.6
240-204359-15	DUP-02	93.0
240-204359-16	MW-58	81.8
LCS 160-662013/2-A	Lab Control Sample	93.8
MB 160-662013/1-A	Method Blank	90.0

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
240-204359-1	JCW-MW-18001	96.8	81.9
240-204359-2	JCW-MW-18004	85.1	78.1
240-204359-3	JCW-MW-18005	76.4	77.4
240-204359-5	MW-50	93.3	81.5
240-204359-6	MW-51	95.8	81.5
240-204359-7	MW-52	90.3	82.6
240-204359-8	MW-53	88.1	83.7
240-204359-9	MW-53R	86.8	81.1
240-204359-10	MW-54R	77.9	81.1
240-204359-10 DU	MW-54R	91.3	83.0
240-204359-11	MW-55	90.3	80.0
240-204359-12	OW-57ROUT	88.1	77.8
240-204359-13	DUP-01	91.8	84.9
240-204359-14	EB-1	88.6	83.0
240-204359-15	DUP-02	93.0	83.4
240-204359-16	MW-58	81.8	80.4
LCS 160-662014/2-A	Lab Control Sample	93.8	80.7
MB 160-662014/1-A	Method Blank	90.0	80.7

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-662013/1-A
Matrix: Water
Analysis Batch: 665830

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 662013

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.04940	U	0.0715	0.0717	1.00	0.122	pCi/L	05/16/24 09:14	06/12/24 07:58	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.0*		*30 - 110*	*05/16/24 09:14*	*06/12/24 07:58*	*1*

Lab Sample ID: LCS 160-662013/2-A
Matrix: Water
Analysis Batch: 665832

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 662013

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.77		1.10	1.00	0.0949	pCi/L	95	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*93.8*		*30 - 110*

Lab Sample ID: 240-204359-10 DU
Matrix: Water
Analysis Batch: 665830

Client Sample ID: MW-54R
Prep Type: Total/NA
Prep Batch: 662013

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.180			0.1486		0.0848	1.00	0.108	pCi/L			0.19	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*91.3*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-662014/1-A
Matrix: Water
Analysis Batch: 662961

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 662014

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4879	U	0.348	0.351	1.00	0.522	pCi/L	05/16/24 09:20	05/22/24 16:45	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.0*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*
Y Carrier	*80.7*		*30 - 110*	*05/16/24 09:20*	*05/22/24 16:45*	*1*

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

Lab Sample ID: LCS 160-662014/2-A
Matrix: Water
Analysis Batch: 662961

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 662014

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.92	10.33		1.37	1.00	0.468	pCi/L	116	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*93.8*		*30 - 110*
Y Carrier	*80.7*		*30 - 110*

Lab Sample ID: 240-204359-10 DU
Matrix: Water
Analysis Batch: 662960

Client Sample ID: MW-54R
Prep Type: Total/NA
Prep Batch: 662014

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.184	U		0.3497	U	0.348	1.00	0.558	pCi/L			0.20	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*91.3*		*30 - 110*
Y Carrier	*83.0*		*30 - 110*

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Prep Batch: 662013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204359-1	JCW-MW-18001	Total/NA	Water	PrecSep STD	
240-204359-2	JCW-MW-18004	Total/NA	Water	PrecSep STD	
240-204359-3	JCW-MW-18005	Total/NA	Water	PrecSep STD	
240-204359-5	MW-50	Total/NA	Water	PrecSep STD	
240-204359-6	MW-51	Total/NA	Water	PrecSep STD	
240-204359-7	MW-52	Total/NA	Water	PrecSep STD	
240-204359-8	MW-53	Total/NA	Water	PrecSep STD	
240-204359-9	MW-53R	Total/NA	Water	PrecSep STD	
240-204359-10	MW-54R	Total/NA	Water	PrecSep STD	
240-204359-11	MW-55	Total/NA	Water	PrecSep STD	
240-204359-12	OW-57ROUT	Total/NA	Water	PrecSep STD	
240-204359-13	DUP-01	Total/NA	Water	PrecSep STD	
240-204359-14	EB-1	Total/NA	Water	PrecSep STD	
240-204359-15	DUP-02	Total/NA	Water	PrecSep STD	
240-204359-16	MW-58	Total/NA	Water	PrecSep STD	
MB 160-662013/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-662013/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
240-204359-10 DU	MW-54R	Total/NA	Water	PrecSep STD	

Prep Batch: 662014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204359-1	JCW-MW-18001	Total/NA	Water	PrecSep_0	
240-204359-2	JCW-MW-18004	Total/NA	Water	PrecSep_0	
240-204359-3	JCW-MW-18005	Total/NA	Water	PrecSep_0	
240-204359-5	MW-50	Total/NA	Water	PrecSep_0	
240-204359-6	MW-51	Total/NA	Water	PrecSep_0	
240-204359-7	MW-52	Total/NA	Water	PrecSep_0	
240-204359-8	MW-53	Total/NA	Water	PrecSep_0	
240-204359-9	MW-53R	Total/NA	Water	PrecSep_0	
240-204359-10	MW-54R	Total/NA	Water	PrecSep_0	
240-204359-11	MW-55	Total/NA	Water	PrecSep_0	
240-204359-12	OW-57ROUT	Total/NA	Water	PrecSep_0	
240-204359-13	DUP-01	Total/NA	Water	PrecSep_0	
240-204359-14	EB-1	Total/NA	Water	PrecSep_0	
240-204359-15	DUP-02	Total/NA	Water	PrecSep_0	
240-204359-16	MW-58	Total/NA	Water	PrecSep_0	
MB 160-662014/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-662014/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
240-204359-10 DU	MW-54R	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-1

Client Sample ID: JCW-MW-18001

Lab Sample ID: 240-204359-1

Date Collected: 05/07/24 06:00
Matrix: Water
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665832	SWS	EET SL	06/12/24 07:48
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:45
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: JCW-MW-18004

Lab Sample ID: 240-204359-2

Date Collected: 05/08/24 06:08
Matrix: Water
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:45
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: JCW-MW-18005

Lab Sample ID: 240-204359-3

Date Collected: 05/08/24 09:02
Matrix: Water
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:45
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: MW-50

Lab Sample ID: 240-204359-5

Date Collected: 05/07/24 08:07
Matrix: Water
Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:45
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-1

Client Sample ID: MW-51
Date Collected: 05/07/24 09:20
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:46
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: MW-52
Date Collected: 05/07/24 10:21
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:46
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: MW-53
Date Collected: 05/07/24 11:20
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:46
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: MW-53R
Date Collected: 05/07/24 12:27
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:46
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-1

Client Sample ID: MW-54R
Date Collected: 05/07/24 12:25
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:06
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662961	SCB	EET SL	05/22/24 16:46
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: MW-55
Date Collected: 05/08/24 07:12
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:06
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662960	SCB	EET SL	05/22/24 16:43
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: OW-57ROUT
Date Collected: 05/08/24 09:47
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662960	SCB	EET SL	05/22/24 16:43
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: DUP-01
Date Collected: 05/07/24 00:00
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662960	SCB	EET SL	05/22/24 16:43
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-1

Client Sample ID: EB-1

Lab Sample ID: 240-204359-14

Date Collected: 05/08/24 12:20

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662960	SCB	EET SL	05/22/24 16:43
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: DUP-02

Lab Sample ID: 240-204359-15

Date Collected: 05/08/24 00:00

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665830	SWS	EET SL	06/12/24 10:05
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662960	SCB	EET SL	05/22/24 16:43
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Client Sample ID: MW-58

Lab Sample ID: 240-204359-16

Date Collected: 05/08/24 11:51

Matrix: Water

Date Received: 05/11/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			662013	MLT	EET SL	05/16/24 09:14
Total/NA	Analysis	903.0		1	665832	SWS	EET SL	06/12/24 09:57
Total/NA	Prep	PrecSep_0			662014	MLT	EET SL	05/16/24 09:20
Total/NA	Analysis	904.0		1	662960	SCB	EET SL	05/22/24 16:43
Total/NA	Analysis	Ra226_Ra228		1	666196	FLC	EET SL	06/13/24 11:27

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-204359-1
Project/Site: Karn/Weadock CCR JCW Landfill

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-24
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	10-31-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing

Client Information	Sampler: JACOB JASSE	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-120141-29048.1
Client Contact: Jacob Krenz	Phone: 734 904 3316	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes: D - HNO3
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #: 5533828.0000			
Project Name: Karn/Weadock CCR JCW Lanfill	Project #: 24024154			
Site:	SSOW#:			Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	904.0, Ra226Ra228_GFPC	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
JCW-MW-18001	5/7/24	0620	G	Water	N	N	X	X	2	
JCW-MW-18004	5/8/24	0608	G	Water	N	N	X	X	2	
JCW-MW-18005	5/8/24	0902	G	Water	N	N	X	X	2	
JCW-MW-18006	5/8/24	1055	G	Water						
MW-50	5/7/24	0807	G	Water	N	N	X	X	2	
MW-51	5/7/24	0932	G	Water	N	N	X	X	2	
MW-52	5/7/24	1021	G	Water	N	N	X	X	2	
MW-53	5/7/24	1130	G	Water	N	N	X	X	2	
MW-53R	5/7/24	1227	G	Water	N	N	X	X	2	
MW-54R	5/7/24	1325	G	Water	N	N	X	X	2	
MW-55	5/8/24	0717	G	Water	N	N	X	X	2	

240-204359 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 5/10/24 0905	Company: C	Received by:	Date/Time: 5/10/24	Company: EENA
Relinquished by:	Date/Time: 5/10/24 0915	Company: EENA	Received by: JESSE MOROSKO	Date/Time: 05/11/24 0800	Company: Bone
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:

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing

Client Information	Sampler: Jake / Jesse	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-120141-29048.2
Client Contact: Jacob Krenz	Phone: 734 904 3716	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes: D - HNO3
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #: 5533828.0000			
Project Name: Karn/Weadock CCR JCW Lanfill	Project #: 24024154			
Site:	SSOW#:			Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	904.0, Ra226Ra228_GFPC	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
OW-57ROUT	5/8/24	0947	G	Water	N	N	X	X	2	
DUP-01	5/7/24	—	G	Water	N	N	X	X	2	
EB--1	5/8/24	1220	G	Water	N	N	X	X	2	
DUP-02	5/8/24	—	G	Water	N	N	X	X	2	
MW-58	5/8/24	1151	G	Water	N	N	X	X	2	

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		5/10/24 0811	EFA		5/10/24	EFA
2		5/10/24 0915	EFA	JESSE MOROSKO	05/11/24 0800	
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins – Cleveland Sample Receipt Form/Narrative Login #
Barberton Facility

Client TRC Site Name

Cooler unpacked by JESSE MOROSKO

Cooler Received on 05/11/24 Opened on 05/11/24

FedEx: 1st Grd Exp UPS FAS Waypoint Client Drop Off Eurofins Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

Eurofins Cooler # EC Foam Box Client Cooler Box Other

Packing material used. Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt X See Multiple Cooler Form

IR GUN # 18 (CF 1.0 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5 Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7 Did all bottles arrive in good condition (Unbroken)?	Yes	No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10 Were correct bottle(s) used for the test(s) indicated?	Yes	No
11 Sufficient quantity received to perform indicated analyses?	Yes	No
12 Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC439975
14. Were VOAs on the COC?	Yes	No
15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17 Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18 CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19 SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container

Sample(s) were received with bubble >6 mm in diameter (Notify PM)

20 SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory

Time preserved Preservative(s) added/Lot number(s)

VOA Sample Preservation Date/Time VOAs Frozen

Login # : ____________

Eurofins - Cleveland Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(EC) Client Box Other	IR GUN #: 18	1.7	1.7	(Wet Ice) Blue Ice Dry Ice Water None
(EC) Client Box Other	IR GUN #: 18	3.4	3.4	(Wet Ice) Blue Ice Dry Ice Water None
(EC) Client Box Other	IR GUN #: 18	3.9	3.9	(Wet Ice) Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None
EC Client Box Other	IR GUN #:			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 Multiple Coolers

5/11/2024

Login Container Summary Report

240-204359

6/14/2024

Temperature readings _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservation Added	Preservation Lot Number
JCW-MW 18001	240-204359-A-1	Plastic 1 liter - Nitric Acid	<2			
JCW-MW-18001	240 204359-B 1	Plastic 1 liter - Nitric Acid	<2			
JCW-MW-18004	240-204359-A-2	Plastic 1 liter - Nitric Acid	<2			
JCW-MW-18004	240-204359-B-2	Plastic 1 liter - Nitric Acid	<2			
JCW-MW 18005	240-204359-A-3	Plastic 1 liter - Nitric Acid	<2			
JCW MW-18005	240-204359-B-3	Plastic 1 liter - Nitric Acid	<2			
JCW-MW-18006	240-204359-A-4	Plastic 1 liter - Nitric Acid	<2			
JCW-MW-18006	240-204359-B-4	Plastic 1 liter - Nitric Acid	<2			
MW-50	240-204359-A-5	Plastic 1 liter - Nitric Acid	<2			
MW-50	240-204359-B-5	Plastic 1 liter - Nitric Acid	<2			
MW-51	240-204359-A-6	Plastic 1 liter - Nitric Acid	<2			
MW 51	240-204359-B-6	Plastic 1 liter - Nitric Acid	<2			
MW-52	240-204359-A-7	Plastic 1 liter - Nitric Acid	<2			
MW-52	240-204359 B-7	Plastic 1 liter - Nitric Acid	<2			
MW-53	240 204359-A-8	Plastic 1 liter - Nitric Acid	<2			
MW-53	240-204359-B-8	Plastic 1 liter - Nitric Acid	<2			
MW-53R	240-204359-A-9	Plastic 1 liter - Nitric Acid	<2			
MW-53R	240-204359-B-9	Plastic 1 liter - Nitric Acid	<2			
MW-54R	240-204359-A-10	Plastic 1 liter - Nitric Acid	<2			
MW-54R	240-204359-B-10	Plastic 1 liter - Nitric Acid	<2			
MW-55	240-204359-A-11	Plastic 1 liter - Nitric Acid	<2			
MW-55	240-204359-B-11	Plastic 1 liter - Nitric Acid	<2			
OW-57ROUT	240-204359 A-12	Plastic 1 liter - Nitric Acid	<2			
OW-57ROUT	240-204359-B-12	Plastic 1 liter - Nitric Acid	<2			
DUP-0	240-204359-A 13	Plastic 1 liter - Nitric Acid	<2			
DUP-0	240-204359-B-13	Plastic 1 liter - Nitric Acid	<2			
EB-1	240-204359-A-14	Plastic 1 liter - Nitric Acid	<2			
EB-1	240-204359-B-14	Plastic 1 liter - Nitric Acid	<2			
DUP-02	240-204359-A-15	Plastic 1 liter - Nitric Acid	<2			
DUP-02	240-204359-B 15	Plastic 1 liter - Nitric Acid	<2			
MW-58	240-204359-A-16	Plastic 1 liter - Nitric Acid	<2			
MW-58	240-204359-B-16	Plastic 1 liter Nitric Acid	<2			

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-184582.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-204359-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/12/2024			Preservation Codes: -
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Karn/Weadock CCR JCW Landfill	Project #: 24024154			Other:
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
JCW-MW-18001 (240-204359-1)	5/7/24	06:00 Eastern		Water			X	X	X	1	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
JCW-MW-18004 (240-204359-2)	5/8/24	06:08 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
JCW-MW-18005 (240-204359-3)	5/8/24	09:02 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-50 (240-204359-5)	5/7/24	08:07 Eastern		Water			X	X	X	1	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-53 (240-204359-8)	5/7/24	11:20 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-53R (240-204359-9)	5/7/24	12:27 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-54R (240-204359-10)	5/7/24	12:25 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-55 (240-204359-11)	5/8/24	07:12 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
OW-57ROUT (240-204359-12)	5/8/24	09:47 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

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: MALISSA LOAR	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: M. Pinette	Date/Time: MAY 14 2024 0850	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:

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-184582.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-204359-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/12/2024	Analysis Requested		Preservation Codes:
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Karn/Weadock CCR JCW Landfill	Project #: 24024154			Other:
Site:	SSOW#:			

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)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
DUP-01 (240-204359-13)	5/7/24	Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
EB-1 (240-204359-14)	5/8/24	12:20 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
DUP-02 (240-204359-15)	5/8/24	Eastern		Water			X	X	X	1	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
MW-58 (240-204359-16)	5/8/24	11:51 Eastern		Water			X	X	X	1	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

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
Relinquished by: MALISSA LOAR	Date/Time:	Company	Received by: M. Pinette	Date/Time: MAY 14 2024 0950	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:

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-204359-1

Login Number: 204359
List Number: 2
Creator: Thornley, Richard W

List Source: Eurofins St. Louis
List Creation: 05/15/24 08:08 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
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: Darby Litz
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Generated 7/16/2024 8:57:24 PM

JOB DESCRIPTION

Karn/Weadock CCR JCW Landfill

JOB NUMBER

240-204359-2

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

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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7/16/2024 8:57:24 PM

Authorized for release by
Kris Brooks, Project Manager II
Kris.Brooks@et.eurofinsus.com
(330)966-9790

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-204359-2
Project/Site: Karn/Weadock CCR JCW Landfill

Qualifiers

Rad

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

Glossary

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

Job ID: 240-204359-2 Eurofins Cleveland

Job Narrative
240-204359-2

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 5/11/2024 8:00 AM. 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 1.7°C, 3.4°C and 3.9°C.

Receipt Exceptions
The number of containers listed on the COC pages do not match what was received for the following: JCW-MW-18001 (240-204359-1), JCW-MW-18006 (240-204359-4), MW-50 (240-204359-5), MW-51 (240-204359-6), MW-52 (240-204359-7), DUP-02 (240-204359-15) and MW-58 (240-204359-16). There is sufficient volume for the requested analyses.

Gas Flow Proportional Counter
Method 903.0: Radium-226 prep batch 160-667247:

Based upon client request, Ra-226 is reported without the standard 21-day waiting period which ensures short-lived alpha-emitting radium isotopes (e.g. Ra-224) have decayed out. The Ra-226 result should be considered to be potentially high biased. Associated samples have activity below the RL JCW-MW-18006 (240-204359-4), (LCS 160-667247/2-A), (MB 160-667247/1-A) and (240-204359-B-4-A DU)

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

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

Method Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-2

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Job ID: 240-204359-2
Project/Site: Karn/Weadock CCR JCW Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-204359-4	JCW-MW-18006	Water	05/08/24 10:55	05/11/24 08:00

Client Sample ID: JCW-MW-18006
Lab Sample ID: 240-204359-4

Date Collected: 05/08/24 10:55
Matrix: Water

Date Received: 05/11/24 08:00

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.218		0.0826	0.0849	1.00	0.0772	pCi/L	06/20/24 08:11	07/10/24 16:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.0*		*30 - 110*	*06/20/24 08:11*	*07/10/24 16:09*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.229	U	0.527	0.527	1.00	0.919	pCi/L	06/20/24 08:13	06/27/24 16:45	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.0*		*30 - 110*	*06/20/24 08:13*	*06/27/24 16:45*	*1*
Y Carrier	*83.0*		*30 - 110*	*06/20/24 08:13*	*06/27/24 16:45*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.447	U	0.533	0.534	5.00	0.919	pCi/L		07/15/24 17:20	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.
Job ID: 240-204359-2
Project/Site: Karn/Weadock CCR JCW Landfill

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
240-204359-4	JCW-MW-18006	96.0
240-204359-4 DU	JCW-MW-18006	96.5
LCS 160-667247/2-A	Lab Control Sample	97.0
MB 160-667247/1-A	Method Blank	98.3

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
240-204359-4	JCW-MW-18006	96.0	83.0
240-204359-4 DU	JCW-MW-18006	96.5	80.7
LCS 160-667248/2-A	Lab Control Sample	97.0	82.2
MB 160-667248/1-A	Method Blank	98.3	81.1

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-667247/1-A
Matrix: Water
Analysis Batch: 669953

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 667247

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01667	U	0.0420	0.0421	1.00	0.0794	pCi/L	06/20/24 08:11	07/10/24 16:08	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.3*		*30 - 110*	*06/20/24 08:11*	*07/10/24 16:08*	*1*

Lab Sample ID: LCS 160-667247/2-A
Matrix: Water
Analysis Batch: 669953

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 667247

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.65		1.09	1.00	0.0838	pCi/L	94	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*97.0*		*30 - 110*

Lab Sample ID: 240-204359-4 DU
Matrix: Water
Analysis Batch: 669953

Client Sample ID: JCW-MW-18006
Prep Type: Total/NA
Prep Batch: 667247

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.218			0.2281		0.0910	1.00	0.0923	pCi/L			0.06	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*96.5*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-667248/1-A
Matrix: Water
Analysis Batch: 668352

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 667248

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2344	U	0.418	0.418	1.00	0.724	pCi/L	06/20/24 08:13	06/27/24 16:45	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.3*		*30 - 110*	*06/20/24 08:13*	*06/27/24 16:45*	*1*
Y Carrier	*81.1*		*30 - 110*	*06/20/24 08:13*	*06/27/24 16:45*	*1*

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

Lab Sample ID: LCS 160-667248/2-A
Matrix: Water
Analysis Batch: 668352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 667248

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.81	8.518		1.42	1.00	0.848	pCi/L	97	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*97.0*		*30 - 110*
Y Carrier	*82.2*		*30 - 110*

Lab Sample ID: 240-204359-4 DU
Matrix: Water
Analysis Batch: 668352

Client Sample ID: JCW-MW-18006
Prep Type: Total/NA
Prep Batch: 667248

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.229	U		0.01773	U	0.446	1.00	0.835	pCi/L			0.22	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*96.5*		*30 - 110*
Y Carrier	*80.7*		*30 - 110*

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-2

Rad

Prep Batch: 667247

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204359-4	JCW-MW-18006	Total/NA	Water	PrecSep STD	
MB 160-667247/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-667247/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
240-204359-4 DU	JCW-MW-18006	Total/NA	Water	PrecSep STD	

Prep Batch: 667248

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-204359-4	JCW-MW-18006	Total/NA	Water	PrecSep_0	
MB 160-667248/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-667248/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
240-204359-4 DU	JCW-MW-18006	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR JCW Landfill

Job ID: 240-204359-2

Client Sample ID: JCW-MW-18006

Date Collected: 05/08/24 10:55
Date Received: 05/11/24 08:00

Lab Sample ID: 240-204359-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			667247	BMW	EET SL	06/20/24 08:11
Total/NA	Analysis	903.0		1	669953	SCB	EET SL	07/10/24 16:09
Total/NA	Prep	PrecSep_0			667248	BMW	EET SL	06/20/24 08:13
Total/NA	Analysis	904.0		1	668352	SCB	EET SL	06/27/24 16:45
Total/NA	Analysis	Ra226_Ra228		1	670775	SCB	EET SL	07/15/24 17:20

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-204359-2
Project/Site: Karn/Weadock CCR JCW Landfill

Laboratory: Eurofins St. Louis

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
Connecticut	State	PH-0241	03-31-25
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-25
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-25
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	10-31-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-204359-2

Login Number: 204359
List Number: 2
Creator: Thornley, Richard W

List Source: Eurofins St. Louis
List Creation: 05/15/24 08:08 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
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	

Appendix F
Field Records

TRC

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance
PROJECT NUMBER:	553828.0000.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	5/6/2024 TO 5/8/24
PURPOSE OF FIELDWORK:	Second Quarter 2024 Groundwater Sampling
WORK PERFORMED BY:	Javier Jasso

5/17/24
SIGNED DATE

5-17-24
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Weadock LF: 2024 GW Com	DATE: 5/7/24	TIME ARRIVED: 0537
PROJECT NUMBER: 553828.0000.0000	AUTHOR: AW JK (JJ)	TIME LEFT: 1400

WEATHER

TEMPERATURE: 39 °F WIND: 15 MPH VISIBILITY: Overcast

WORK / SAMPLING PERFORMED

Wells Sampled = JCW-MW-16001, MS/MSD, JCW-DUP-16001 MW-50, Dup#01, MW 51, MW 52, MW 53, MW-53R MW 54R

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED 5/13/24 DATE

CHECKED BY 5-13-24 DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Weadock LF: 2024 GW Com	DATE: 5/8/24	TIME ARRIVED: 0531
PROJECT NUMBER: 553828.0000.0000	AUTHOR: AW JK (JJ)	TIME LEFT: 1230

WEATHER		
TEMPERATURE: 51 °F	WIND: 15 MPH	VISIBILITY: overcast

WORK / SAMPLING PERFORMED

JCW MW 18004, MW 59, JCW-MW-18005, MW-57RA1
JCW MW-18006, DUP #02, MW 58, F.B. #1 EB #1

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED 5/13/24 DATE

CHECKED BY 5-17-24 DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Weadock LF: 2024 GW Co	SAMPLER NAME:	J. Jasso,
PROJECT NO.:	553828.0000.0000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
HERON DIPPER-T	TRC A2

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
NA	NA

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
HERON DIPPER-T	TRC A2

PURGING METHOD

NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
PERISTALTIC PUMP	TRC A2

SAMPLING METHOD

NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
PERISTALTIC PUMP	TRC A2
GEOTECH DISPOSABLE FILTER	0.45 MICRON
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

POTABLE WATER SOURCE	DI WATER SOURCE
STORE BOUGHT	LABORATORY PROVIDED
SIGNED	DATE
5/13/24	
CHECKED BY	DATE
	5-13-24

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	MODEL: PRO DSS	SAMPLER: JJ
PROJECT NO.:	553828.0000.0000	SERIAL #: 471	DATE: 5/8/24

PH CALIBRATION CHECK

pH 7 (LOT #): 23509160 (EXP. DATE): 10/25 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 23508CW (EXP. DATE): 10/25 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
700 / 700	400 / 400	☑ WITHIN RANGE	0556
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 23J0103 (EXP. DATE): 10/24 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1360 / 1360	23	☑ WITHIN RANGE	0556
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 23610006 (EXP. DATE): 7/25 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
223 / 223	23	☑ WITHIN RANGE	0556
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
8.35 / 8.35	23	☑ WITHIN RANGE	0556
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A3097 (EXP. DATE): 4/25 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0 / 0	/	☑ WITHIN RANGE	0556
100 / 100	/	☑ WITHIN RANGE	0556
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED _____ 5/13/24 DATE

CHECKED BY _____ 5-13-24 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	MODEL: YSI DSS	SAMPLER: JJ
PROJECT NO.:	553828.0000.0000	SERIAL #: A1	DATE: 5/7/24

PH CALIBRATION CHECK

pH 7 (LOT #): 36J9118 (EXP. DATE): 10/25	pH 4 / 10 (LOT #): 36J0806 (EXP. DATE): 10/25	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
700 / 700	400 / 400	☑ WITHIN RANGE	0500
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 36J0103 (EXP. DATE): 10/24	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
1360 / 1360	23	☑ WITHIN RANGE	0500
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 236100006 (EXP. DATE): 7/26	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
223 / 223	22.0	☑ WITHIN RANGE	0500
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING /SATURATED AIR			
8.51 / 8.91	22	☑ WITHIN RANGE	0500
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A30697 (EXP. DATE): 4/25	(LOT #): (EXP. DATE):	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0 / 0	/	☑ WITHIN RANGE	0500
100 / 100	/	☐ WITHIN RANGE	0500
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED 5/13/24 DATE

CHECKED BY 5-13-24 DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	DATE:	5/6/24
PROJECT NUMBER:	553828.0000.0000	AUTHOR:	Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
JCW-MW-18001	0634	TOC	17.09	23.75	NA	NM
JCW-MW-18004	0710	TOC	12.30	14.71	NA	NM
JCW-MW-18005	0754	TOC	8.50	14.33	NA	NM
JCW-MW-18006	0800	TOC	12.40	23.70	NA	NM
JCW-OW-18001	0630	TOC	6.54	20.28	NA	NM
JCW-OW-18002	0636	TOC	10.40	19.80	NA	NM
JCW-OW-18003	0647	TOC	6.24	18.42	NA	NM
JCW-OW-18004	0713	TOC	6.22	14.64	NA	NM
JCW-OW-18006	0601	TOC	6.53	23.45	NA	NM
LH-103R	0733	TOC	20.69	33.46	NA	NM
LH-104	0719	TOC	8.60	14.05	NA	NM
~~CW~~-MW-20	0741	TOC	6.35	14.00	NA	NM
MW-50	0634	TOC	13.65	19.42	NA	NM
MW-51	0640	TOC	14.45	20.00	NA	NM
MW-52	0646	TOC	15.10	19.90	NA	NM
MW-53	0652	TOC	13.85	18.16	NA	NM
MW-53R	0700	TOC	14.50	18.62	NA	NM
MW-54R	0705	TOC	13.92	17.22	NA	NM
MW-55	0726	TOC	14.10	16.40	NA	NM
MW-58	0620	TOC	5.25	18.25	NA	NM
OW-51	0641	TOC	9.10	17.27	NA	NM
OW-53	0651	TOC	7.40	18.00	NA	NM
OW-54	0707	TOC	7.19	14.50	NA	NM
OW-55	0627	TOC	6.26	18.02	NA	NM
OW-56	0745	TOC	5.65	19.21	NA	NM

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

5/13/24
SIGNED DATE

5-13-24
CHECKED DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Weadock LF: 2024 GW Compliance	DATE: 5/6/24
PROJECT NUMBER:	553828.0000.0000	AUTHOR: Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-56R	0744	TOC	5.68	20.22	NA	NM
OW-57 IN	0755	TOC	5.01	19.60	NA	NM
OW-57R IN	0754	TOC	5.24	20.14	NA	NM
OW-57 OUT	0750	TOC	8.89	19.46	NA	NM
OW-57R OUT	0757	TOC	8.21	20.22	NA	NM
JCW-MW-15007	0816	TOC	3.25	8.90	NA	NM
JCW-MW-15009	0810	TOC	8.85	13.00	NA	NM
JCW-MW-15010	0807	TOC	17.38	19.55	NA	NM
JCW-MW-15028	0812	TOC	7.30	25.10	NA	NM
MW-15002	0840	TOC	6.65	16.89	NA	NM
MW-15008	0821	TOC	4.25	17.42	NA	NM
MW-15016	0841	TOC	3.45	7.75	NA	NM
MW-15019	0834	TOC	5.23	16.67	NA	NM
JCW-MW-15003	0612		8.41	DUM		
OW-61	0624		6.40	26.20		
JCW MW 15031	0648		15.10	DUM		
JCW MW-15026	0701		13.10	DUM		
MW-16R	0704		14.20	DUM		
JCW MW 15021	0716		14.78	DUM		
~~OW-54~~	~~0745~~		~~5.65~~	~~19.25~~		
MW-19	0801		6.42	20.81		
MW-106A	0813		7.60	41.16		
MW-15020	0823		4.95	17.25		
MW-116B	0828		4.50	32.80		
MW-15024	0830		5.74	17.15		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 5/13/24 DATE

CHECKED 5-13-24 DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Weadock LF: 2023 GW Compliance	DATE:	5/6/25
PROJECT NUMBER:	514403.0000.0000	AUTHOR:	Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-57 IN		TOC			NA	NM
~~OW-57R IN~~		~~TOC~~			~~NA~~	NM
OW-57 OUT		TOC			NA	NM
OW-57R OUT		TOC			NA	NM
OW-61		TOC			NA	NM
OW-63		TOC			NA	NM
MW-15018	0837		5.38		1001	
JCWMW15001	0847		7.81		DNM	

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 5/13/24 DATE

CHECKED 5-13-24 DATE

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553814.0001.0000	BY: AW, JK, JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW.1500 2 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1431	DATE: 5/8/24	SAMPLE	TIME: 1451	DATE: 5/8/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.68 SU	CONDUCTIVITY: 495 umhos/cm	
			ORP: -111.5 mV	DO: 1.25 mg/L	
DEPTH TO WATER: 6.64 T/ PVC			TURBIDITY: 8.5 NTU		
DEPTH TO BOTTOM: 16.89 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 12.7 °C	FERROUS Fe _____ mg/L	
VOLUME REMOVED: 4 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: non	
COLOR: Orange ODOR: non			FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1431	200	7.70	624	-103.5	8.3	113.0	15.2	6.66	INITIAL
1436		7.74	521	-111.0	1.50	8.6	12.9	6.85	1
1441		7.69	511	-111.1	1.23	8.5	12.8	6.85	2
1446		7.68	500	-111.3	1.25	8.5	12.8	6.85	3
1451		7.68	495	-111.5	1.25	8.5	12.7	6.85	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ———
COC NUMBER: ———	SIGNATURE:	DATE SIGNED: 5/13/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553814.0001.0000	BY: AW, JK, JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW-1500E | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1245	DATE: 5/8/24	SAMPLE	TIME: 1315	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.95 SU	CONDUCTIVITY: 1760 umhos/cm	
			ORP: -125.5 mV	DO: 0.70 mg/L	
DEPTH TO WATER: 4.25 T/ PVC			TURBIDITY: 9.91 NTU		
DEPTH TO BOTTOM: 17.42 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 11.5 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: Brownish	ODOR: none		FILTRATE (0.45 um) ☐ YES	☒ NO	
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE	☒ VERY		QC SAMPLE: ☐ MS/MSD	☒ DUP- Background	
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1245	200	6.90	2014	223	8.37	21.5	17.7	4.25	INITIAL
1250		6.96	2341	-107.5	1.26	9.5	11.9	4.5	1
1255		6.90	2113	-107.0	0.94	10.8	11.7	4.5	2
1300		6.95	1855	-114.5	0.81	10.0	11.5	4.5	3
1305		6.95	1757	-125.0	0.77	10.0	11.5	4.5	4
1310		6.95	1755	-125.3	0.71	10.0	11.5	4.5	5
1315		6.95	1760	-125.5	0.70	9.91	11.5	4.5	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
2	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	4	1 L	PLASTIC	B	☐ Y ☒ N
2	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE:	DATE SIGNED: 5/10/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553814.0001.0000	BY: AW, JK, JJ	DATE: 5/13/24	BY: JJL	DATE: 5-13-24

SAMPLE ID: MW-1501G | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 15 12	DATE: 5/8/24	SAMPLE	TIME: 1547	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.10 SU	CONDUCTIVITY: 1767 umhos/cm	
			ORP: -117.1 mV	DO: 0.69 mg/L	
DEPTH TO WATER: 3.4C T/ PVC			TURBIDITY: 9.9 NTU		
DEPTH TO BOTTOM: 7.75 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 12.1 °C	FERROUS Fe _____ mg/L	
VOLUME REMOVED: 7 ☒ LITERS ☐ GALLONS			COLOR: clear	ODOR: none	
COLOR: Brown	ODOR: none		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1512	200	7.07	1732	-90.1	83	260	15.1	3.4C	INITIAL
1517		7.00	1814	-93.6	1.85	83	12.8	3.7C	1
1522		7.08	1737	-103.5	1.00	35	12.9	3.7C	2
1527		7.10	1761	-110.5	0.85	23	12.7	3.7C	3
1532		7.10	1736	-114.8	0.78	17	12.6	3.7C	4
1537		7.10	1748	-117.5	0.73	10	12.6	3.7C	5
1542		7.10	1757	-117.5	0.70	10	12.5	3.80	6
1547		7.10	1767	-117.5	0.69	9.9	12.5	3.85	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553814.0001.0000	BY: AW, JK, JJ	DATE: 5/7/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW-15019 (15009) | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1346	DATE: 5/8/24	SAMPLE	TIME: 1413	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.95 SU	CONDUCTIVITY: 2044 umhos/cm	
			ORP: -104.5 mV	DO: 0.77 mg/L	
DEPTH TO WATER: 5.30 T/ PVC			TURBIDITY: 5.8 NTU		
DEPTH TO BOTTOM: 16.87 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 10.6 °C	FERROUS Fe _____ mg/L	
VOLUME REMOVED: 5 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: clear	ODOR: none		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1346	200	7.07	2037	-106.8	8.3	10	14.0	5.30	INITIAL
1353		6.96	2039	-94.5	1.40	5.8	11.5	5.35	1
1358		6.95	2041	-97.1	0.98	5.8	11.4	5.35	2
1403		6.95	2046	-104.0	0.86	5.6	10.6	5.35	3
1408		6.95	2046	-104.3	0.80	5.9	10.0	5.35	4
1413		6.95	2044	-104.5	0.77	5.8	10.6	5.35	5
									6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553814.0001.0000	BY: AW, JK, JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: ~~FB #01~~ / EB #01 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:	SAMPLE	TIME: 1407	DATE: 5/8/24
PURGE METHOD: ☑ PUMP ☐ BAILER	PERISTALTIC PUMP		PH: NM SU	CONDUCTIVITY: NM umhos/cm	
			ORP: NM mV	DO: NM mg/L	
DEPTH TO WATER: ____ T/ PVC			TURBIDITY: NM NTU		
DEPTH TO BOTTOM: ____ T/ PVC			☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: ____ °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: ____ ☐ LITERS ☐ GALLONS			COLOR: ____	ODOR: ____	
COLOR: ____ ODOR: ____			FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP- ____		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS: EQ - Background		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
									INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
	250 mL	PLASTIC	A	☐ Y ☐ N		125 mL	PLASTIC	D	☐ Y ☐ N
	125 mL	PLASTIC	A	☐ Y ☐ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☐ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE: [signature]	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: XW-MW 18001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0547	DATE: 5/7/24	SAMPLE	TIME: 0630	DATE: 5/7/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.80 SU	CONDUCTIVITY: 3457	umhos/cm
			ORP: -131.0 mV	DO: 0.76	mg/L
DEPTH TO WATER:	17.11 T/ PVC		TURBIDITY: 5.4 NTU		
DEPTH TO BOTTOM:	23.75 T/ PVC		☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 10.3 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	7 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	cloudy ODOR: non		FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			QC SAMPLE: ☑ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0547	200	6.80	1726	223	0.71	5.5	11.0	17.11	INITIAL
0550		6.68	3334	-87.5	1.31	6.2	10.3	17.14	1
0555		6.70	3376	-96.0	1.0	6.7	10.3	17.12	2
0600		6.75	3370	-107	0.92	5.8	10.3	17.12	3
0605		6.75	3395	-125.0	0.86	5.7	10.3	17.12	4
0610		6.80	3430	-130.5	0.80	5.6	10.3	17.12	5
0615		6.80	3446	-130.8	0.77	5.5	10.3	17.12	6
0620		6.80	3457	-131.0	0.76	5.4	10.3	17.18	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☑ N		125 mL	PLASTIC	D	☐ Y ☐ N
3	125 mL	PLASTIC	A	☐ Y ☑ N		40 mL	VOA	E	☐ Y ☐ N
2	60 mL	VOA	A	☐ Y ☑ N	2	1 L	PLASTIC	B	☐ Y ☑ N
3	125 mL	PLASTIC	B	☐ Y ☑ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-17-24

SAMPLE ID: JCW-MW-18001 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0650	DATE: 5/7/24	SAMPLE	TIME: 0720	DATE: 5/7/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 6.85 SU	CONDUCTIVITY: 1591 umhos/cm	
			ORP: -133.5 mV	DO: 0.79 mg/L	
DEPTH TO WATER: 6.55 T/ PVC			TURBIDITY: 2.9 NTU		
DEPTH TO BOTTOM: 20.28 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 10.1 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 3 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: Clear ODOR: none			FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP- ____		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0650	100	7.25	883	-78.6	9.1	11.0	9.3	6.51	INITIAL
0655		6.87	1623	-100	2.0	9.4	9.8	6.70	.5
0700		6.85	1618	-106	1.3	8.6	9.9	6.70	1
0705		6.85	1617	-117.0	1.2	8.3	9.9	6.70	1.5
0710		6.85	1608	-132.0	0.89	8.8	10.0	6.70	2
0715		6.85	1601	-133.3	0.83	7.9	10.1	6.70	2.5
0720		6.85	1595	-133.5	0.79	7.9	10.1	6.70	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
2	60 mL	VOA	A	☐ Y ☒ N		1 L	PLASTIC	B	☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-17-24

SAMPLE ID: MW 50 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0737	DATE: 5/7/24	SAMPLE	TIME: 0807	DATE: 5/7/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.49 SU	CONDUCTIVITY: 1455	umhos/cm
			ORP: -142.1 mV	DO: 0.71	mg/L
DEPTH TO WATER:	13.70 T/ PVC		TURBIDITY: 5.4 NTU		
DEPTH TO BOTTOM:	19.42 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 10.0 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	6 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Clear ODOR: none		FILTRATE (0.45 um) ☐ YES	☑ NO	
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☑ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☑ DUP- 101	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0737	200	7.41	1429	-64.5	9.1	21.0	9.9	13.70	INITIAL
0743		7.44	1449	-93.6	1.7	8.0	9.9	13.80	1
0749		7.45	1456	-107	1.1	6.0	10.0	13.80	2
0755		7.50	1461	-123.6	0.89	5.8	10.0	13.80	3
0757		7.48	1458	-142.0	0.80	5.5	10.0	13.80	4
0802		7.49	1456	-142.3	0.77	5.5	10.0	13.80	5
0807		7.49	1455	-142.1	0.75	5.4	10.0	13.80	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
2	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	4	1 L	PLASTIC	B	☐ Y ☒ N
2	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW 51 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0645	DATE: 5/7/24	SAMPLE	TIME: 0920	DATE: 5/7/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.35 SU	CONDUCTIVITY: 1269	umhos/cm
			ORP: -141.0 mV	DO: 0.83	mg/L
DEPTH TO WATER:	14.50 T/ PVC		TURBIDITY: 6.9 NTU		
DEPTH TO BOTTOM:	20.00 T/ PVC		☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 9.5 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	7 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: NOR	
COLOR:	Clear ODOR NOR		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0645	200	7.98	1243	-94.1	9.9	24	10.4	1450	INITIAL
0850		7.55	1249	-121.0	2.30	8.8	9.1	1455	1
0911		7.40	1256	-125.5	1.4	8.4	9.5	1455	2
0930		7.40	1258	-130.5	1.2	8.4	9.4	1455	3
0905		7.39	1260	-132.5	1.0	8.0	9.5	1451	4
0910		7.35	1262	-140.0	0.93	7.0	9.5	1455	5
0915		7.35	1267	-140.8	0.87	6.9	9.5	1451	6
0920		7.35	1269	-141.0	0.83	6.9	9.5	1455	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW 57 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0946	DATE: 5/7/24	SAMPLE	TIME: 1021	DATE: 5/7/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 6.96 SU	CONDUCTIVITY: 1717 umhos/cm	
			ORP: -119.1 mV	DO: 0.79 mg/L	
DEPTH TO WATER: 15.15 T/ PVC			TURBIDITY: 5.2 NTU		
DEPTH TO BOTTOM: 19.90 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 10.6 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 7 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: NOR	
COLOR: Clear	ODOR: NOR		FILTRATE (0.45 um) ☐ YES ☑ NO		
TURBIDITY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP- ____		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0946	200	7.40	1680	-93.5	86.1	18	12	15.15	INITIAL
0951		7.00	1703	-110.0	1.5	6.9	10.4	1530	1
0956		6.99	1707	-105.8	1.1	6.7	10.4	1530	2
1001		6.97	1712	-113.5	0.91	6.0	10.5	1530	3
1006		6.97	1713	-114.0	0.86	5.0	10.5	1530	4
1011		6.96	1716	-119.0	0.83	5.3	10.6	1530	5
1016		6.96	1715	-119.3	0.81	5.2	10.6	1530	6
1021		6.96	1717	-119.5	0.79	5.2	10.6	1530	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW-53 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1057	DATE: 5/7/24	SAMPLE	TIME: 1130	DATE: 5/9/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.50 SU	CONDUCTIVITY: 1176 umhos/cm	
			ORP: -173.5 mV	DO: 0.79 mg/L	
DEPTH TO WATER: 13.90 T/ PVC			TURBIDITY: 7.9 NTU		
DEPTH TO BOTTOM: 18.18 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 10.8 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 7 ☑ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: Cloudy	ODOR: none		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY ☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			FILTRATE COLOR:	FILTRATE ODOR:	
			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1057	200	7.87	524	-107.5	8.3	45	15.2	13.90	INITIAL
1100		7.71	1179	-161.0	2.70	28	11.1	14.00	1
1107		7.60	1179	-157.0	1.2	16.6	10.9	14.00	2
1110		7.55	1183	-160.0	098	12.7	11.0	14.00	3
1117		7.55	1181	-170.0	090	10.8	10.9	14.00	4
1120		7.50	1179	-173.6	083	8.0	10.9	14.00	5
1127		7.50	1177	-173.3	080	8.0	10.8	1400	6
1130		7.50	1176	-173.5	0.79	7.9	10.8	1400	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ~~~
COC NUMBER: ~~~	SIGNATURE:	DATE SIGNED: 5/9/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW 537R | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1157	DATE: 5/7/24	SAMPLE	TIME: 1227	DATE: 5/7/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 14.50 T/ PVC

DEPTH TO BOTTOM: 18.82 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS

COLOR: Brownish ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.12 SU | CONDUCTIVITY: 1266 umhos/cm

ORP: -149.0 mV | DO: 0.84 mg/L

TURBIDITY: 6.9 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 11.0 °C | FERROUS Fe _____ mg/L

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: _____ | FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1157	200	7.46	1257	-142.5	8.90	500	15.3	1450	INITIAL
1202		7.37	1264	-145.0	3.5	25	11.6	1470	1
1207		7.10	1285	-146.0	1.10	12.5	10.9	1470	2
1212		7.10	1281	-144.1	1.0	11.9	11.2	1470	3
1217		7.12	1273	-148.8	0.91	7.0	11.5	1470	4
1222		7.12	1267	-148.5	0.86	6.9	11.4	1470	5
1227		7.12	1266	-149.0	0.84	6.9	11.4	1470	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW 54R — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1250	DATE: 5/7/24	SAMPLE	TIME: 1325	DATE: 5/7/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.19 SU	CONDUCTIVITY: 1127	umhos/cm
			ORP: -105.3 mV	DO: ~~2.93~~ 2.95	mg/L
DEPTH TO WATER: 14.02 T/ PVC			TURBIDITY: 6.91 NTU		
DEPTH TO BOTTOM: 17.22 T/ PVC			☐ ~~NONE~~ ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 11.9 °C	FERROUS Fe ____	mg/L
VOLUME REMOVED: 7 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: BROWNISH	ODOR: none		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
			QC SAMPLE: ☐ MS/MSD ☐ DUP- ____		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1250	200	7.46	1136	-143.5	8.9	69.0	12.8	14.02	INITIAL
1255		7.24	1135	-114.5	5.30	100	12.0	14.10	1
1300		7.24	1129	-88.0	5.0	20	11.7	14.10	2
1305		7.20	1130	-79.0	4.97	10	12.4	14.10	3
1310		7.20	1126	-.95	4.0	8	12.0	14.10	4
1315		7.19	1129	-105.0	3.0	7	12.1	14.10	5
1320		7.19	1125	-105.1	2.95	6.95	12.0	14.10	6
1325		7.19	1127	-105.3	2.95	6.95	11.9	14.16	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/8/24	BY: JK	DATE: 5-13-24

SAMPLE ID: JCW-MW 18004 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0548	DATE: 5/8/24	SAMPLE	TIME: 0600	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.91 SU	CONDUCTIVITY: 1398	umhos/cm
			ORP: 20.0 mV	DO: 8.61	mg/L
DEPTH TO WATER:	12.35 T/ PVC		TURBIDITY: 6.0 NTU		
DEPTH TO BOTTOM:	14.71 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 9.9 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	2 ☒ LITERS ☐ GALLONS		COLOR: clear	ODOR: none	
COLOR:	cloudy ODOR: none		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0548	100	6.96	720	23.3	8.35	55	13.8	12.35	INITIAL
0553		6.73	1442	0.3	8.31	10	10.2	12.60	.5
0558		6.90	1394	19.7	8.67	6.0	9.9	12.80	1
0603		6.91	1398	20.0	8.63	6.0	9.9	13.0	1.5
0608		6.91	1398	20.0	8.61	6.0	9.9	13.2	2
									2.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/13/24

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW 55 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0643	DATE: 5/8/24	SAMPLE	TIME: 0712	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.91 SU	CONDUCTIVITY: 1236	umhos/cm
			ORP: -107.1 mV	DO: 0.84	mg/L
DEPTH TO WATER:	14.30 T/ PVC		TURBIDITY: 80 NTU		
DEPTH TO BOTTOM:	16.40 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 10.0 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	6 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: NONE	
COLOR:	orange ODOR: NON		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0643	200	7.03	1220	-32.7	8.83	340	11.0	14.30	INITIAL
0648		6.94	1235	-77.1	1.80	45	10.0	14.30	1
0653		6.92	1231	-94	1.2	20	9.9	14.30	2
0658		6.92	1233	-100	1.0	12.5	9.9	14.30	3
0703		6.91	1234	-107.0	0.95	8.0	9.8	14.30	4
0708		6.91	1236	-107.3	0.88	8.0	9.9	14.30	5
0712		6.91	1236	-107.1	0.84	8.0	10.0	14.30	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-17-24

SAMPLE ID: 3(W)MW18005 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0742	DATE: 5/8/24	SAMPLE	TIME: 2400	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.84 SU	CONDUCTIVITY: 1569	umhos/cm
			ORP: -103.5 mV	DO: 0.83	mg/L
DEPTH TO WATER:	8.50 T/ PVC		TURBIDITY: 10 NTU		
DEPTH TO BOTTOM:	16.33 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 10.7 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	8 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Brownish ODOR: none		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0742	100	7.09	1593	-50.1	9.7	130	11.6	8.50	INITIAL
0747		6.87	1605	-63.5	1.72	77	11.1	9.33	.5
0752		6.87	1605	-70.5	1.30	75	11.1	9.50	1
0757		6.83	1602	-75	1.20	69	11.2	9.65	1.5
0802		6.84	1586	-80	1.0	57	10.7	9.80	2
0807		6.84	1563	-85	0.97	33	10.7	9.85	2.5
0812		6.84	1548	-95	0.93	18	10.8	9.90	3
0817		6.85	1550	-92.1	0.91	15	10.8	9.95	3.5
0822		6.85	1549	-92.5	0.89	12	10.8	9.95	4
0827		6.84	1569	-95.9	0.86	1600	10.7	9.95	4.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/8/24

TRC WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Weadock LF: 2024 GW Co	PREPARED			CHECKED		
PROJECT NUMBER:	553828.0000.0000	BY:	JJ	DATE: 5/13/24	BY: ~~SJK~~	DATE: 5-13-24	

SAMPLE ID: JCW-MW-1800 S

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0832	100	6.84	1556	-98.0	0.65	200	10.8	10.0	5
0837		6.84	1549	-100	0.60	23	10.8	10.0	5.5
0842		6.84	1549	-101	0.57	18	10.8	10.0	6.0
0847		6.84	1552	-101	0.57	15	10.8	10.0	6.5
0852		6.84	1564	-103.3	0.54	10	10.8	10.0	7
0857		6.84	1567	-103.5	0.53	10	10.7	10.0	7.5
0902		6.84	1569	-103.8	0.53	10	10.7	10.0	8

SIGNATURE: 5/13/24 DATE SIGNED: _____

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/8/24	BY: JK	DATE: 5-13-24

SAMPLE ID: GW-57R out | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0827	DATE: 5/8/24	SAMPLE	TIME: 0947	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.20 SU	CONDUCTIVITY: 1223	umhos/cm
			ORP: -95.0 mV	DO: 2.27	mg/L
DEPTH TO WATER: 8.20 T/ PVC			TURBIDITY: 9.1 NTU		
DEPTH TO BOTTOM: 20.22 T/ PVC			☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA	☐ LITERS ☐ GALLONS		TEMPERATURE: 12.2 °C	FERROUS Fe	mg/L
VOLUME REMOVED: 2	☐ LITERS ☐ GALLONS		COLOR: clear	ODOR: non	
COLOR: cloudy	ODOR: non		FILTRATE (0.45 um) ☐ YES	☐ NO	
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP-	
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0827	100	7.40	1097	-73.0	8.2	60	15.2	8.20	INITIAL
0832		7.23	1225	-102.5	3.25	11.4	12.3	9.10	.5
0837		7.20	1224	-94.5	2.28	9.8	12.2	9.95	1
0842		7.20	1224	-94.5	2.27	9.5	12.2	10.30	1.9
0947		7.20	1223	-95.0	2.25	9.5	12.2	10.40	2
~~0852~~									~~2.5~~
									3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/8/24	BY: JK	DATE: 5-13-24

SAMPLE ID: JCW-MW 18006 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1020	DATE: 5/8/24	SAMPLE	TIME: 1055	DATE: 5/8/24
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.05 SU	CONDUCTIVITY: 1324	umhos/cm
			ORP: -155.8 mV	DO: 0.73	mg/L
DEPTH TO WATER:	12.66 T/ PVC		TURBIDITY: 9.9 NTU		
DEPTH TO BOTTOM:	23.70 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 13.70 °C	FERROUS Fe	mg/L
VOLUME REMOVED:	7 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Brown	ODOR: non	FILTRATE (0.45 um) ☐ YES	☒ NO	
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☐ MODERATE	☒ VERY		QC SAMPLE: ☐ MS/MSD	☒ DUP- FO3	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1020	200	7.47	715	-140	8.20	250	15.8	12.66	INITIAL
1025		7.22	1173	-157.6	1.37	40.5	13.60	12.70	1
1030		7.17	1137	-155.5	1.0	17.0	13.66	12.70	2
1035		7.10	1198	-152.0	0.87	14.8	13.50	12.70	3
1040		7.10	1250	-153.5	0.81	15.0	13.70	12.70	4
1045		7.05	1293	-155.5	0.77	10	13.70	12.70	5
1050		7.05	1309	-155.8	0.75	10	13.70	12.70	6
1055		7.05	1324	-155.8	0.73	9.9	13.70	12.70	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
2	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	4	1 L	PLASTIC	B	☐ Y ☒ N
2	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	5-10-24	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/13/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: MW 58 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1126	DATE: 5/8/24	SAMPLE	TIME: 1151	DATE: 5/8/24
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.11 SU	CONDUCTIVITY: 2530 umhos/cm	
			ORP: -129.5 mV	DO: 0.80 mg/L	
DEPTH TO WATER: 5.05 T/ PVC			TURBIDITY: 5.0 NTU		
DEPTH TO BOTTOM: 18.25 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 11.3 °C	FERROUS Fe ____ mg/L	
VOLUME REMOVED: 5 ☒ LITERS ☐ GALLONS			COLOR: clear	ODOR: none	
COLOR: Clear	ODOR: none		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR: ____	FILTRATE ODOR: ____	
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP- ____		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1126	200	7.34	1437	-116.7	8.0	10	14.4	5.21	INITIAL
1131		7.16	2600	-120.7	1.44	5.1	11.6	52T	1
1136		7.15	2599	-122	1.0	5.T	11.3	52T	2
1141		7.15	2587	-125	091	5.0	11.2	52T	3
1146		7.15	2534	-125.3	089	5.0	11.3	52T	4
1151		7.15	2530	-125.5	080	5.0	11.3	52T	5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE:	DATE SIGNED: 5/13/24

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: ~~CB-6+FB-01~~ WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:

PURGE METHOD: ☑ PUMP ☐ PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: _____ T/ PVC

DEPTH TO BOTTOM: _____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: _____ ☐ LITERS ☐ GALLONS

COLOR: _____ ODOR: _____

TURBIDITY
☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1215	DATE: 5/8/24

PH: NA SU CONDUCTIVITY: NA umhos/cm

ORP: NA mV DO: NA mg/L

TURBIDITY: NR NTU

~~☑~~ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: NA °C FERROUS Fe _____ mg/L

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☐ YES ~~☑~~ NO

FILTRATE COLOR: _____ FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
									INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
	250 mL	PLASTIC	A	☐ Y ☐ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N		1 L	PLASTIC	B	☐ Y ☐ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
	125 mL	PLASTIC	C	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: 5/13/24

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Weadock LF: 2024 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	553828.0000.0000	BY: JJ	DATE: 5/13/24	BY: JK	DATE: 5-13-24

SAMPLE ID: C.B.#01 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:	SAMPLE	TIME: 1220	DATE: 5/8/24

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: ____ T/ PVC

DEPTH TO BOTTOM: ____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: ____ ☐ LITERS ☐ GALLONS

COLOR: ____ ODOR: ____

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: NM SU CONDUCTIVITY: NM umhos/cm

ORP: NM mV DO: NM mg/L

TURBIDITY: NM NTU

☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: NM °C FERROUS Fe ____ mg/L

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: ____ FILTRATE ODOR: ____

QC SAMPLE: ☐ MS/MSD ☐ DUP- ____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
									INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
	250 mL	PLASTIC	A	☐ Y ☐ N		125 mL	PLASTIC	D	☐ Y ☐ N
1	125 mL	PLASTIC	A	☐ Y ☒ N		40 mL	VOA	E	☐ Y ☐ N
	60 mL	VOA	A	☐ Y ☐ N	2	1 L	PLASTIC	B	☐ Y ☒ N
	125 mL	PLASTIC	B	☐ Y ☐ N					☐ Y ☐ N
1	125 mL	PLASTIC	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-10-24	AIRBILL NUMBER: ____
COC NUMBER: ____	SIGNATURE:	DATE SIGNED: 5/13/24

CHAIN OF CUSTODY

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135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER: Q2-2024 JC Weadock Porewater Wells	PROJECT NUMBER: 24-0344	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	
SEND REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register; TRC			

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	Alkalinity	REMARKS
24-0344-01	5/7/24	0620	GW	JCW-MW-18001	5	4	1						x	x	x	x	
-02	5/8/24	0808	GW	JCW-MW-18004	3	2	1						x	x	x		
-03	5/8/24	0902	GW	JCW-MW-18005	3	2	1						x	x	x		
-04	5/8/24	0955	GW	JCW-MW-18006	3	2	1						x	x	x		
-05	5/7/24	0807	GW	MW-50	3	2	1						x	x	x		
-06	5/7/24	0930	GW	MW-51	3	2	1						x	x	x		
-07	5/7/24	1021	GW	MW-52	3	2	1						x	x	x		
-08	5/7/24	1130	GW	MW-53	3	2	1						x	x	x		
-09	5/7/24	1227	GW	MW-53R	3	2	1						x	x	x		
-10	5/7/24	1327	GW	MW-54R	3	2	1						x	x	x		
-11	5/8/24	0717	GW	MW-55	3	2	1						x	x	x		
-12	5/8/24	0947	GW	OW-57ROUT	3	2	1						x	x	x		

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
	5/10/24 0700	
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS:

Received on Ice? ☐ Yes ☐ No M&TE #: _____

Temperature: _____ °C Cal. Due Date: _____

CHAIN OF CUSTODY

Pg ~~28 of 34~~ 33 of 38

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Page 2 of 2

SAMPLING SITE / CUSTOMER: Q2-2024 JC Weadock Porewater Wells	PROJECT NUMBER: **24-0344**	SAP CC or WO#:	ANALYSIS REQUESTED (Attach List if More Space is Needed)
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register; TRC	MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste		

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	Alkalinity	REMARKS
24-0344-13	5/8/24	1151	GW	MW-58	3	2	1						x	x	x		
-14	5/7/24	—	GW	DUP-JCW-LF-01	3	2	1						x	x	x		
-15	5/8/24	—	GW	DUP-JCW-LF-02	3	2	1						x	x	x		
-16	5/7/24	0602	GW	JCW-MW-18001 MS	2	1	1						x	x			
-17	5/7/24	0602	GW	JCW-MW-18001 MSD	2	1	1						x	x			
-18	5/8/24	1215	W	FB-01	2	1	1						x	x			
-19	5/8/24	1230	W	EB-01	2	1	1						x	x			

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:	COMMENTS:
[signature]	5/10/24 0730	[signature]	
RELINQUISHED BY: [signature]	DATE/TIME:	RECEIVED BY: [signature]	Received on Ice? ☐ Yes ☐ No M&TE #: _____ Temperature: _____ °C Cal. Due Date: _____

CHAIN OF CUSTODY

Pg ~~29 of 34~~ 34 of 38

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q4-2024 JC Weadock ASD	PROJECT NUMBER: **24-0345**	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	
SEND REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register; TRC			

MATRIX CODES:
GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	ANALYSIS REQUESTED (Attach List if More Space is Needed): Total Metals	Anions	TDS	Alkalinity
24-0345-01	5/7/24	0730	GW	JCW-OW-18001	5	4	1						x	x	x	x

QA REQUIREMENT:
☐ NPDES
☒ TNI
☐ ISO 17025
☐ 10 CFR 50 APP. B
☐ INTERNAL INFO
☐ OTHER _____

REMARKS

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
[signature]	5/10/24 0720	[signature]
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS:

Received on Ice? ☐ Yes ☐ No M&TE #: _____

Temperature: _____ °C Cal. Due Date: _____

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins Environment Testing

Client Information	Sampler: JAVIER JASSO	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-120141-29048.1
Client Contact: Jacob Krenz	Phone: 734 904 3316	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes: D - HNO3
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #: 5533828.0000			
Project Name: Karn/Weadock CCR JCW Lanfill	Project #: 24024154			
Site:	SSOW#:			Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	904.0, Ra226Ra228_GFPC	903.0 - Standard Target List											Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D												
JCW-MW-18001	5/7/24	0620	G	Water	N	N	X	X											2	
JCW-MW-18004	5/8/24	0608	G	Water	N	N	X	X											2	
JCW-MW-18005	5/8/24	0902	G	Water	N	N	X	X											2	
JCW-MW-18006	5/8/24	1055	G	Water																
MW-50	5/7/24	0807	G	Water	N	N	X	X											2	
MW-51	5/7/24	0920	G	Water	N	N	X	X											2	
MW-52	5/7/24	1021	G	Water	N	N	X	X											2	
MW-53	5/7/24	1130	G	Water	N	N	X	X											2	
MW-53R	5/7/24	1227	G	Water	N	N	X	X											2	
MW-54R	5/7/24	1325	G	Water	N	N	X	X											2	
MW-55	5/8/24	0717	G	Water	N	N	X	X											2	

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

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

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

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		5/10/24 0905				EEN
	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:

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

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Client Information	Sampler: Jacob Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-120141-29048.2
Client Contact: Jacob Krenz	Phone: 734 904 3310	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes: D - HNO3
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #: 5533828.0000			
Project Name: Karn/Weadock CCR JCW Lanfill	Project #: 24024154			Other:
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	904.0, Ra226Ra228_GFPC	903.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
OW-57ROUT	5/8/24	0947	G	Water	N	N	X	X	3	
DUP-01	5/7/24	—	G	Water	N	N	X	X	3	
EB--1	5/8/24	1220	G	Water	N	N	X	X	3	
DUP-02	5/8/24	—	G	Water	N	N	X	X	3	
MW-58	5/8/24	1151	G	Water	N	N	X	X	3	

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5/10/24 0811				EEN A
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:

CHAIN OF CUSTODY

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q2-2024 JCW-DEK Background Wells

PROJECT NUMBER: 24-0343

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	REMARKS
24-0343-01	5/8/24	1451	GW	MW-15002	3	2	1						x	x	x	
-02	5/8/24	1315	GW	MW-15008	3	2	1						x	x	x	
-03	5/8/24	1447	GW	MW-15016	3	2	1						x	x	x	
-04	5/8/24	1413	GW	MW-15019	3	2	1						x	x	x	
-05	5/8/24	—	GW	DUP-Background	3	2	1						x	x	x	
-06	5/8/24	1605	W	FB- Background	1								x			

RELINQUISHED BY: _____ DATE/TIME: 5/10/24 0700 RECEIVED BY: _____

RELINQUISHED BY: _____ DATE/TIME: _____ RECEIVED BY: _____

COMMENTS:

Received on Ice? ☐ Yes ☐ No M&TE #: _____

Temperature: _____ °C Cal. Due Date: _____

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

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Client Information	Sampler: Javier Jasso	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-120140-33282.1
Client Contact: Jacob Krenz	Phone: 734 904 3310	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR Background Well	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes: D - HNO3

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
	Preservation Code:						D	D		
MW-15002	5/8/24	1451	G	Water	N	N	X	X	3	
MW-15008	5/8/24	1315	G	Water	N	N	X	X	3	
MW-15016	5/8/24	1457	G	Water	N	N	X	X	3	
MW-15019	5/8/24	1413	G	Water	N	N	X	X	3	
DUP-Background	5/8/24	—	G	Water	N	N	X	X	3	
EQ-Backgroud	5/8/24	1405	G	Water	N	N	X	X	3	
				Water						

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time: 5/10/24 0815	Company: TRC	Received by:	Date/Time: 5/10/24	Company: FEN
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:

Appendix G
Alternate Source Demonstration Supporting Information

Consumers Energy
Count on Us®

A CMS Energy Company

Date: July 30, 2024

To: Operating Record

From: Harold D. Register, Jr., P.E.

RE: Alternate Source Demonstration Professional Engineer Certification, §257.94(e)2
JC Weadock Landfill CCR Unit

Professional Engineer Certification Statement [40 CFR 257.94(e)2]

I hereby certify that the alternative source demonstration presented within this Fourth Quarter 2023 Hydrogeological Monitoring Report for the JC Weadock Landfill CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e)2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e)2.

Harold D. Register, Jr.

Signature

July 30, 2024

Date of Certification

Harold D. Register, Jr., P.E.

Name

6201056266

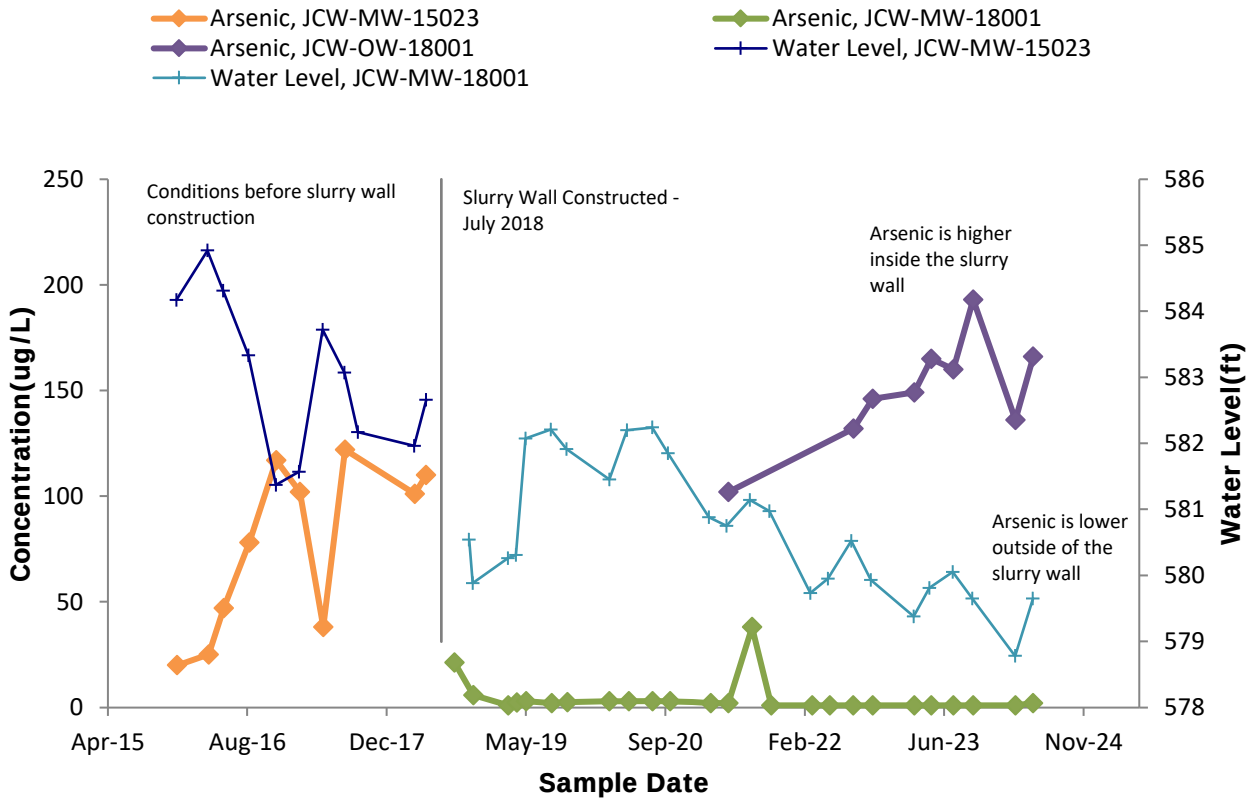
Professional Engineer Certification Number

07/30/2024

References

TRC (July 2024). *2024 Semiannual Groundwater Monitoring Report/Second Quarter 2024 Hydrogeological Monitoring Report, JC Weadock Landfill Solid Waste Disposal Area, Essexville, Michigan*

Figure G1: Time Series Plots for JCW-MW-18001 ASD



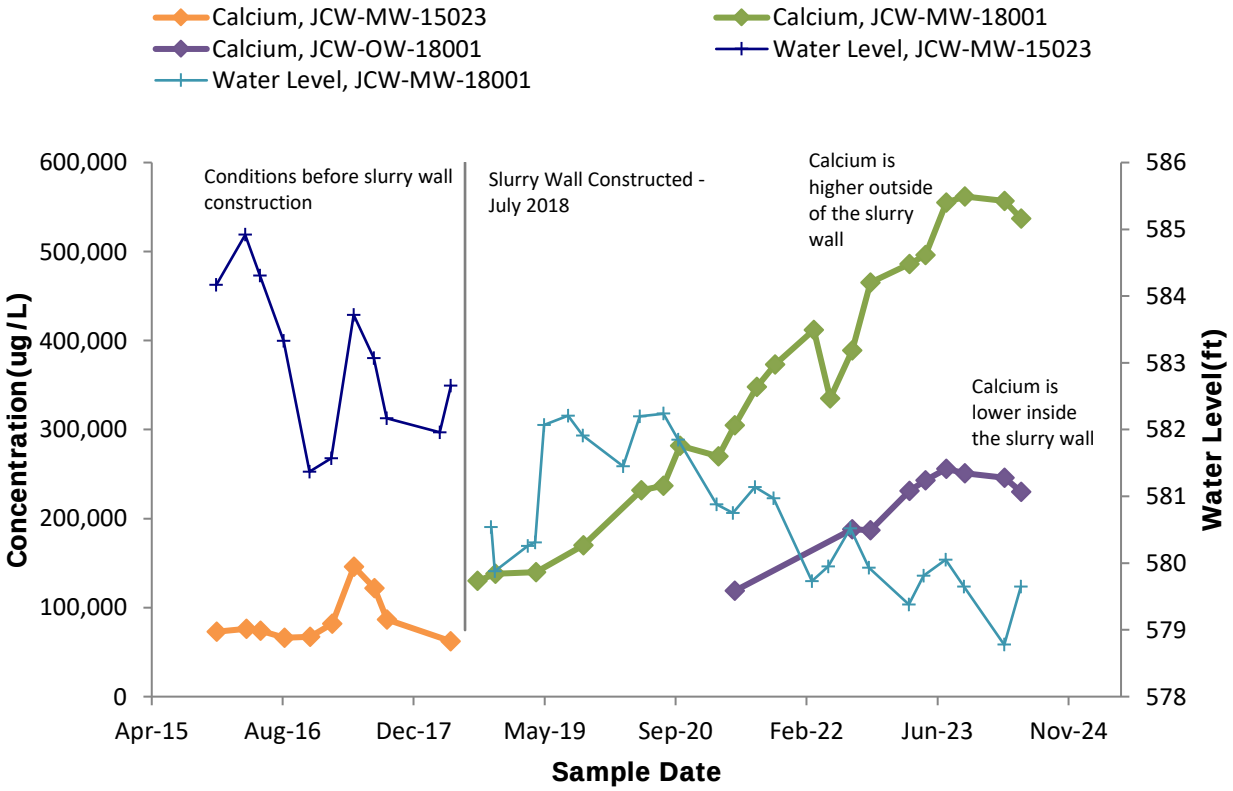
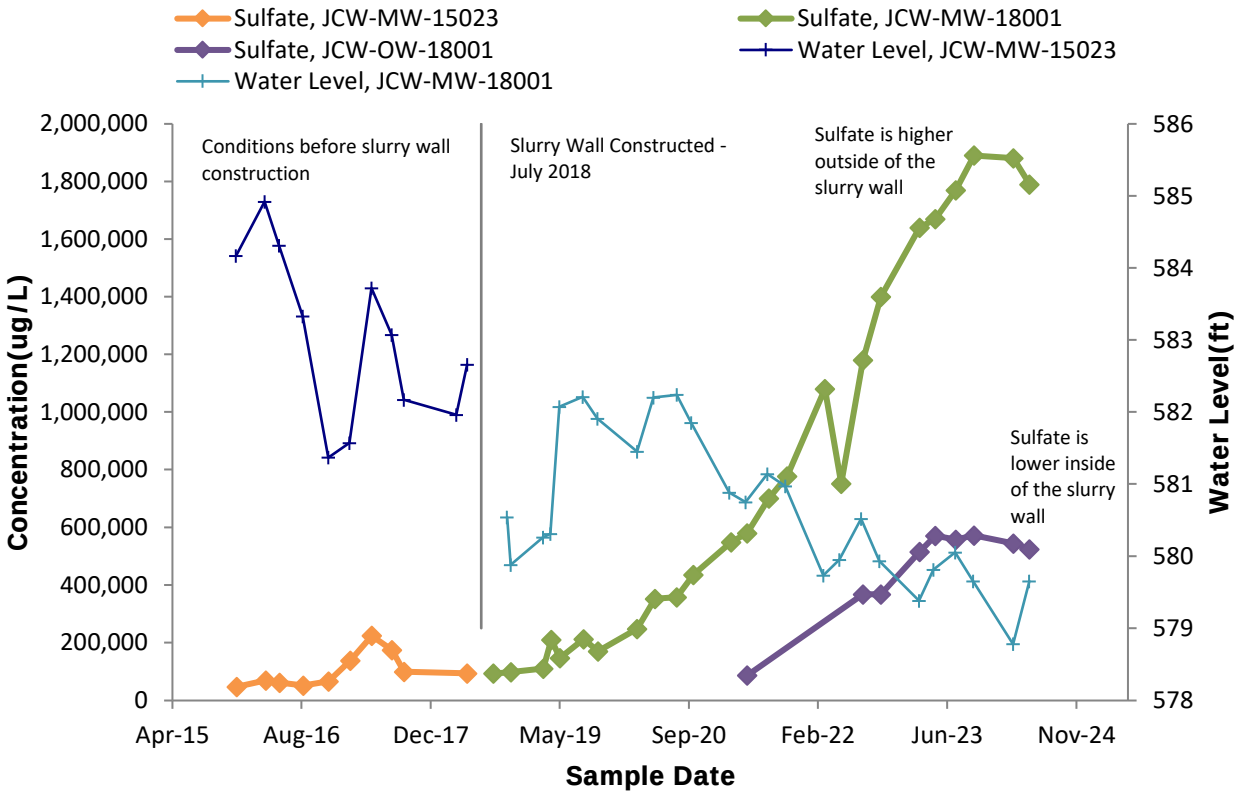


Figure G1: Time Series Plots for JCW-MW-18001 ASD



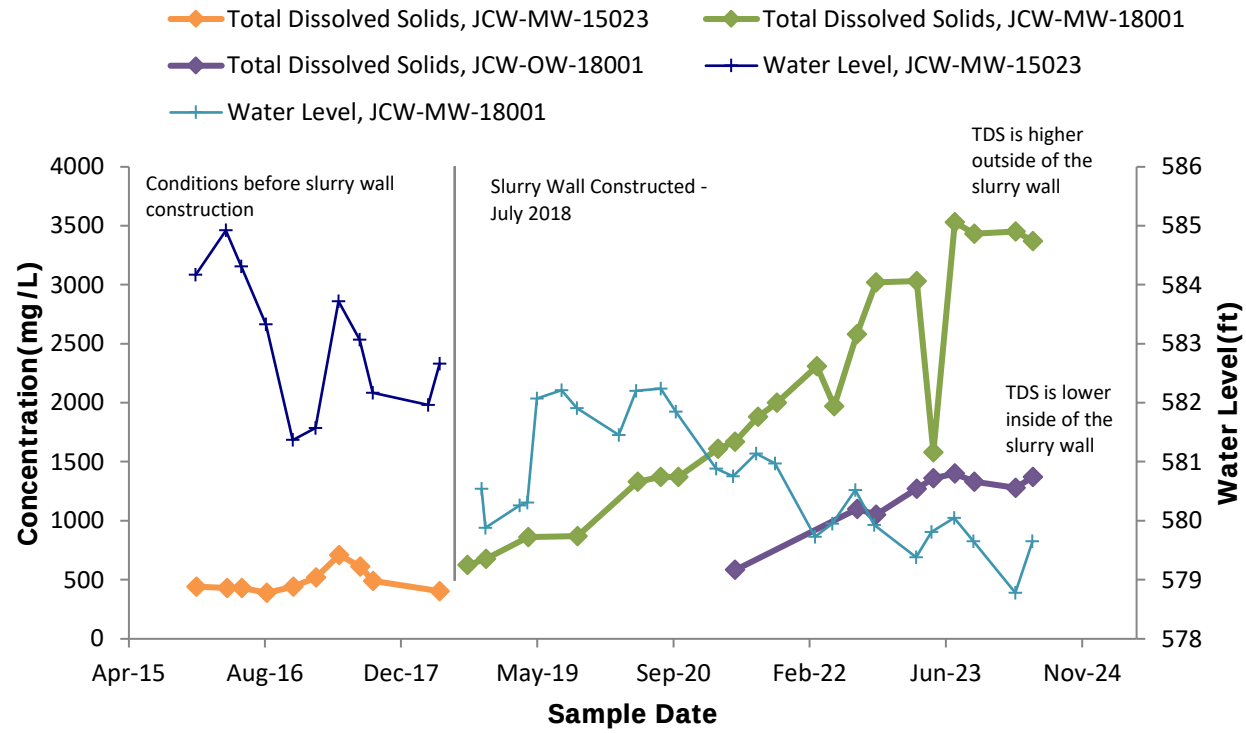
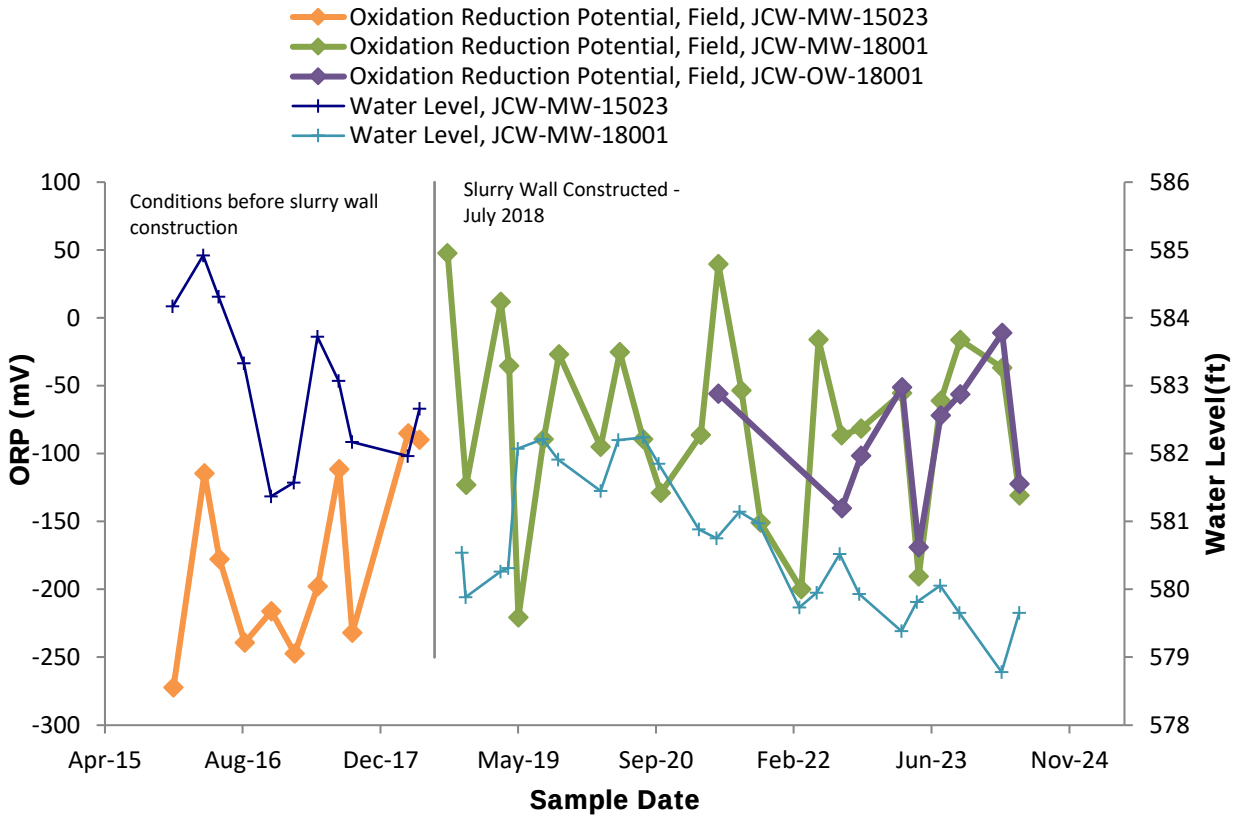


Figure G1: Time Series Plots for JCW-MW-18001 ASD



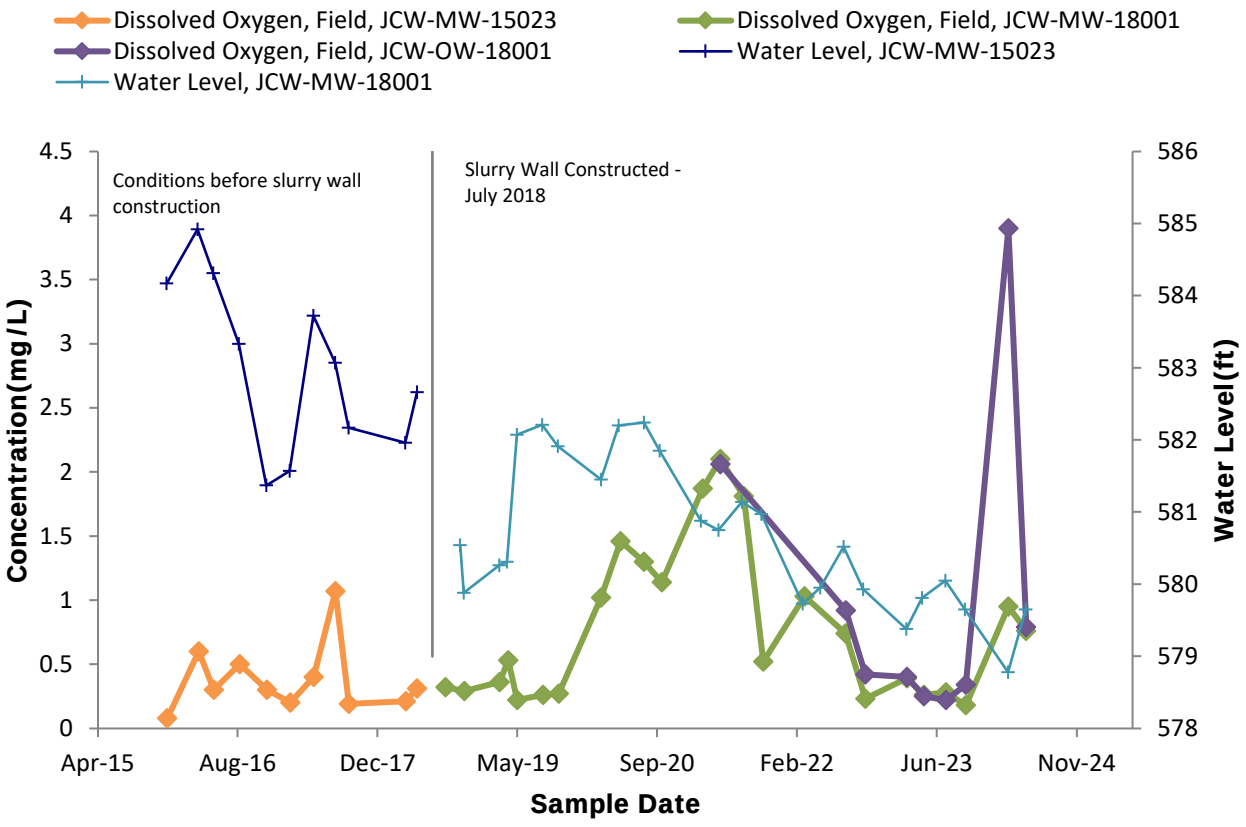
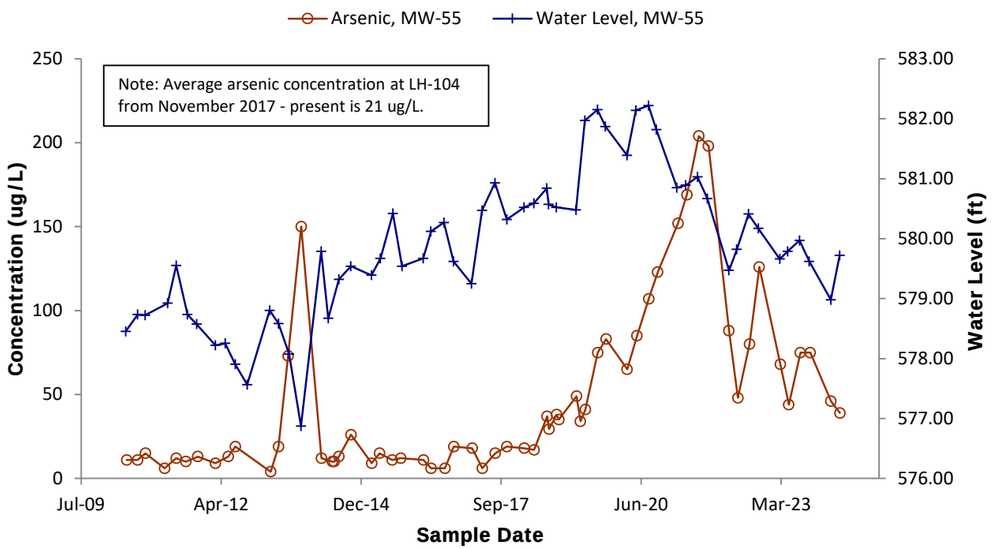
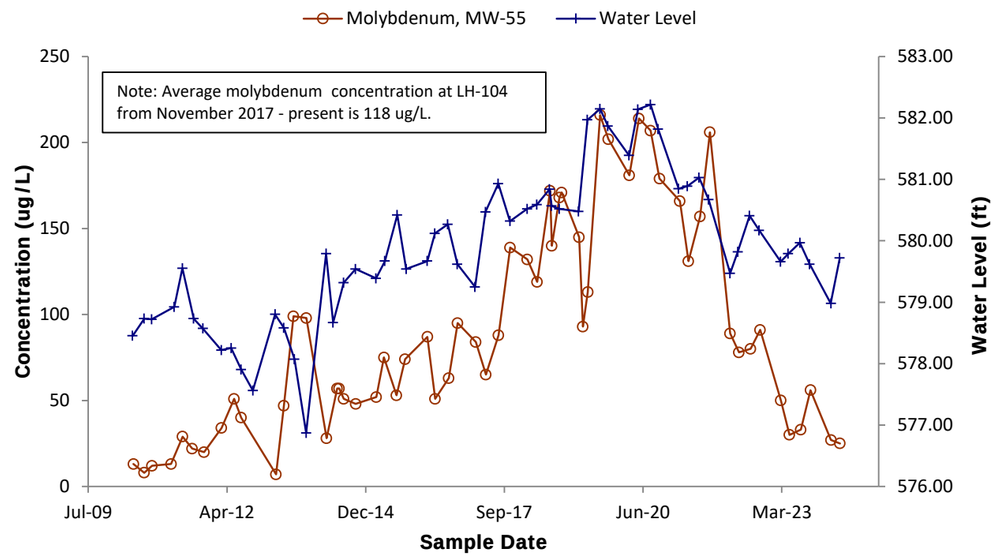
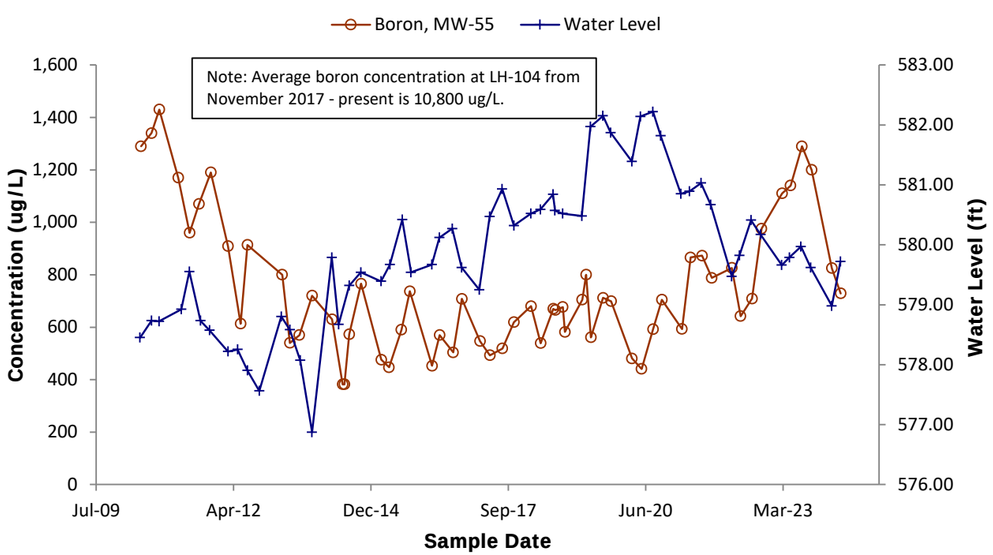
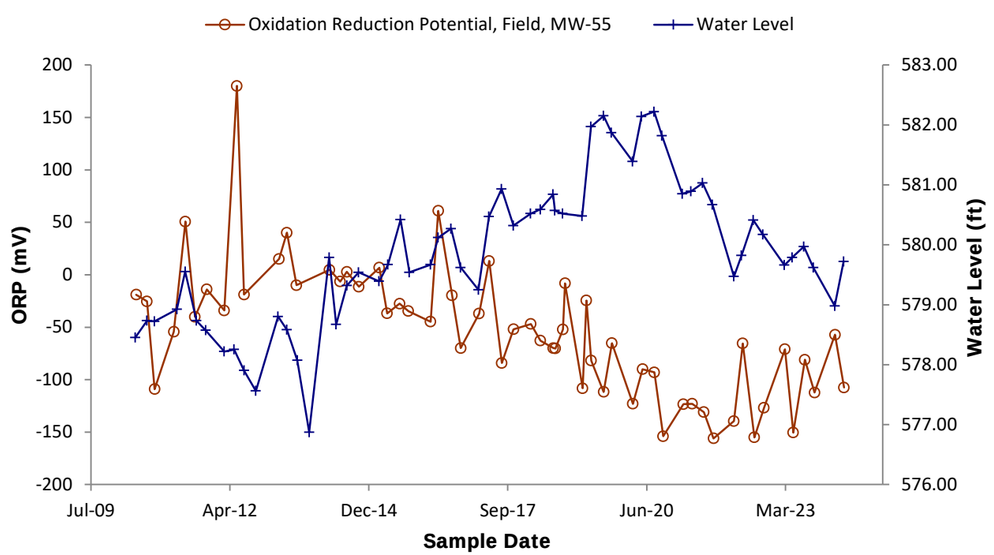


Figure G2: Time Series Plots for MW-55 ASD









Enclosure 3
First Semiannual 2024 Nature and Extent Data Summary, JC Weadock, Consumers Energy, Essexville, Michigan. (TRC, July 30, 2024).

1540 Eisenhower Pl.
Ann Arbor, MI 48108

T 734.971.7080
TRCcompanies.com

Technical Memorandum

Date:	July 30, 2024
To:	J.R. Register, Consumers Energy
From:	Darby Litz, TRC Kristin Lowery, TRC
Project No.:	553828.0000 Phase 2 Task 2
Subject:	First Semiannual 2024 Nature and Extent Data Summary, JC Weadock, Consumers Energy, Essexville, Michigan

Introduction

In response to the United States Environmental Protection Agency's (U.S. EPA's) Resource Conservation and Recovery Act (RCRA) Coal Combustion Residual rule ("CCR Rule") promulgated on April 17, 2015, as amended, Consumers Energy Company (Consumers Energy) has conducted groundwater monitoring at the JC Weadock Bottom Ash Pond and Landfill CCR Units. During the statistical evaluation of the initial assessment monitoring event (May 2018), arsenic was present in one downgradient monitoring well at statistically significant levels exceeding the Groundwater Protection Standard (GWPS) at the Weadock Landfill[1] and beryllium and lithium were present in one downgradient monitoring well at statistically significant levels exceeding the GWPSs at the Weadock Bottom Ash Pond[2].

The CCR Rule 40 CFR §257.96(a) requires that an owner or operator initiate an assessment of corrective measures (ACM) to prevent further release, to remediate any releases, and to restore impacted areas to original conditions if any Appendix IV constituent has been detected at a statistically significant level exceeding a GWPS. The *Assessment of Corrective Measures* (ACM)[3] was initiated on April 14, 2019 and was certified and submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on September 11, 2019 in accordance with the schedule in §257.96.

Per §257.95(g)(1), in the event that the facility determines, pursuant to §257.93(h), that there is a statistical exceedance of the GWPSs for one or more of the Appendix IV constituents, the facility must characterize the nature and extent of the release of CCR as well as any site conditions that may affect the remedy selected. The nature and extent characterization was performed using data collected from existing site wells. Installation of additional monitoring wells at locations downgradient of the CCR

[1] TRC. 2019. *Statistical Evaluation of Initial Assessment Monitoring Sampling Event, JC Weadock Landfill, Consumers Energy Company, Essexville, Michigan*. January 14.

[2] TRC. 2019. *Statistical Evaluation of Initial Assessment Monitoring Sampling Event, JC Weadock Bottom Ash Pond, Consumers Energy Company, Essexville, Michigan*. January 14.

[3] TRC. 2019*. Assessment of Corrective Measures – JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Units.* Prepared for Consumers Energy Company. September 11.

units was not necessary or feasible due to the proximity of the surface water bodies and the lack of a shallow water-bearing unit to the south demonstrated by site hydrogeological investigations. Monitoring wells are shown on Figure 1.

Approach

Given the proximity of the Weadock Bottom Ash Pond to the Weadock Landfill at the Weadock property, the nature and extent of contamination was assessed from a site-wide perspective rather than on a per CCR unit basis. The nature and extent of groundwater impacted by a release from the Weadock Bottom Ash Pond overlaps with groundwater impacted by operation of the Weadock Landfill. Additionally, looking at impacted groundwater on a site-wide basis was more practical from a risk mitigation standpoint, given:

- the likely age of the release(s);
- a long operational history of ash management;
- the historical use of CCR as fill; and
- The influence of geochemistry on several of the Appendix IV constituent concentrations in groundwater.

Consistent with the ACM, the evaluation of the nature and extent of contamination in groundwater focuses on the constituents which triggered corrective measures: arsenic, beryllium, and lithium.

Groundwater Nature and Extent Relative to Groundwater Protection Standards

As discussed in the ACM, the nature and extent of contamination (i.e., arsenic, beryllium, and lithium) in groundwater relative to GWPSs has been defined per the RCRA CCR Rule requirements based on the site-specific hydrogeology. Although arsenic, beryllium, and lithium concentrations have previously exceeded the GWPS within the groundwater monitoring system wells, these constituents are delineated within the limits of the property owned by Consumers Energy and there are currently no adverse effects on human health or the environment from either surface water or groundwater due to CCR management at the Weadock Bottom Ash Pond or Weadock Landfill. The property is owned and operated by Consumers Energy and groundwater is not used for drinking water. There are no on-site drinking water wells and there are no surface water potable water intakes within 3 miles of the site, so the drinking water pathway is not complete. A shallow water-bearing unit is not observed to the south of the landfill, which prevents offsite migration of Appendix III and Appendix IV constituents.

The Weadock Bottom Ash Pond has been certified as closed. Beryllium and lithium are no longer present in groundwater at concentrations exceeding the GWPS and arsenic was demonstrated to have remained at concentrations below the GWPS in the Weadock Bottom Ash Pond monitoring well network. Groundwater data collected post-CCR removal demonstrates that the remedy is complete per the criteria set forth in §257.98(c) and the remedy is protective of human health and the environment as presented in the Completion of Remedy Letter Report[4] and the Weadock Bottom Ash Pond CCR unit was certified closed[5]. Beryllium and lithium have never been detected at concentrations above the

[4] Consumers Energy. 2023. *JC Weadock Bottom Ash Pond Coal Combustion Residual (CCR) Unit, 40 CFR 257.98(e) Completion of Remedy Letter Report*. November 10.

[5] Consumers Energy. 2023. *JC Weadock Bottom Ash Pond 40 CFR 257.102(c) Closure by Removal Certification*. November 10.

GWPSs in the Weadock Landfill monitoring well network. As such, this nature and extent evaluation focuses on arsenic relative to the Weadock Landfill CCR unit.

Graphs depicting concentrations versus time for arsenic observed within the Weadock Landfill groundwater monitoring system wells are included in Attachment A. The distribution of arsenic relative to the Weadock Landfill in the shallow water-bearing unit as compared to the GWPS is shown on Figure 1. Three categories were assigned to the arsenic groundwater data collected from August 2022 to May 2024 (i.e., a minimum of 8 semi-annual data points) to develop Figure 1, as follows:

- White – No Exceedances: all concentrations were below the GWPS
- Yellow – Two or More Exceedances: individual observations above the GWPS[6]
- Orange – Statistically Significant GWPS Exceedances[7]

The following is a summary of the RCRA Appendix IV nature and extent evaluation for arsenic.

Arsenic

Arsenic concentrations have at times exceeded the GWPS in two groundwater monitoring wells located along the Weadock Landfill perimeter (MW-55, and JCW-MW-18006), although these exceedances of the GWPS are not statistically significant. These areas of elevated arsenic concentrations are limited in extent and are dependent upon geochemical conditions, which are changing either due to lake levels rising or in the case of JCW-MW-18006, activities related to the Weadock Bottom Ash Pond closure. Also, an Alternate Source Demonstration (ASD) for arsenic at MW-55 was included in Appendix G of the 2019 *Annual Groundwater Monitoring and Corrective Action Report for the Weadock Landfill (*2019 Annual Report*)*.[8] The basis for this ASD is summarized below and updated time series plots in support of this ASD are included in the *2024 Semiannual Groundwater Monitoring Report and Second Quarter 2024 Hydrogeological Monitoring Report* (24Q2 HMP Report).[9]

Data collected from the 2018 investigation at MW-55 as well as data collected during routine sampling events for Part 115 and Federal CCR groundwater compliance show the following:

– **Distinct Chemistry from Leachate** – The leachate chemistry from a monitoring well screened at the base of the ash fill (LH-104) is distinctly different from the groundwater chemistry near MW-55 and the temporary monitoring wells installed by TRC in the investigation area, as illustrated Appendix G of the 2019 Annual Report. Additionally, concentrations of arsenic and molybdenum are generally much lower, and concentrations of boron are much higher within the landfill (LH-104) than outside of the landfill at MW-55 (Figure G2: 24Q2 HMP Report).

[6] Although an exceedance is defined as a single detection above the GWPS, confidence intervals will be used to determine compliance per the CCR Rule, using the statistical procedures and performance standards in § 257.93(f) and (g)

[7] Lower confidence limit is above the GWPS based upon most recent assessment monitoring statistical evaluation using the past eight compliance sampling events.

[8] TRC. 2020. *2019 Annual Groundwater Monitoring Report* – JC Weadock Power Plant Landfill CCR Unit. Prepared for Consumers Energy Company. January 30.

[9] TRC. 2024. *2024 Semiannual Groundwater Monitoring Report and Second Quarter 2024 Hydrogeological Monitoring Report* – JC Weadock Solid Waste Disposal Area. July 30.

- ***Conservative Tracer*** – Boron is a metalloid known to be present in coal ash and can be used as a conservative tracer in groundwater. The average concentration of boron in Leachate Headwell LH-104 (10,800 ug/L: November 2017- October 2023) is significantly higher than concentrations observed at any of the other locations sampled as a part of this monitoring program. Additionally, recently observed boron concentrations at MW-55 are similar to or lower than historical concentrations, which further supports that the water quality at MW-55 is not directly affected by groundwater migrating from the landfill.
- ***Reducing Conditions and Groundwater Head Levels*** – Water levels observed at MW-55, as shown in Appendices A and G of the 24Q2 HMP Report, increased over 4-ft between 2010 and 2020. The oxidation-reduction potential (ORP) at MW-55 has generally decreased (i.e., is more reducing) since 2010. The lowering of ORP over time as a result of increased water levels has changed the geochemical conditions in the vicinity of MW-55 and has resulted in increased solubility of arsenic and molybdenum. Since 2021, water levels have been generally decreasing, resulting in a slight increase in ORP (i.e., is less reducing) and decreases in concentrations of both arsenic and molybdenum, which further illustrates the relationship between groundwater elevations, redox state, and concentration of arsenic and molybdenum in groundwater.

Summary

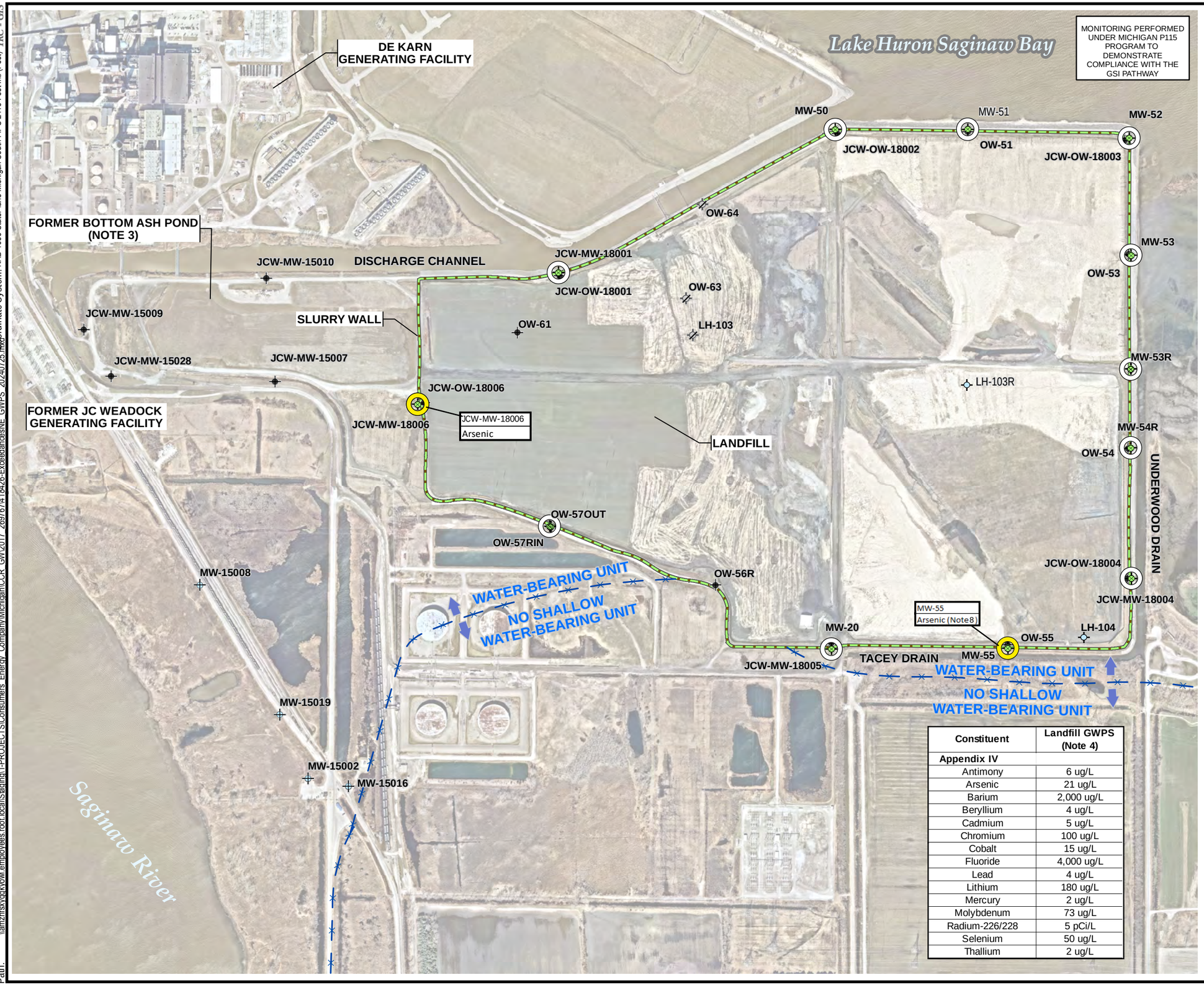
The nature and extent of arsenic in the shallow water-bearing unit is defined in accordance with the Federal CCR rule based on the site-specific hydrogeology. Beryllium and lithium concentrations in groundwater have been addressed as a part of the Weadock Bottom Ash Pond closure. Although arsenic concentrations at times exceed the GWPS within the groundwater monitoring system wells, the concentrations are not present at statistically significant levels. Arsenic is delineated within the limits of the property owned by Consumers Energy and there are currently no adverse effects on human health or the environment from either surface water or groundwater due to CCR management at the Weadock Bottom Ash Pond or Weadock Landfill. Risk from potential exposure to groundwater is managed.

Attachments

Figure 1 Nature and Extent Summary: GWPS Exceedances

Attachment A Time Series Graphs

Figure



Constituent	Landfill GWPS (Note 4)
Appendix IV	
Antimony	6 ug/L
Arsenic	21 ug/L
Barium	2,000 ug/L
Beryllium	4 ug/L
Cadmium	5 ug/L
Chromium	100 ug/L
Cobalt	15 ug/L
Fluoride	4,000 ug/L
Lead	4 ug/L
Lithium	180 ug/L
Mercury	2 ug/L
Molybdenum	73 ug/L
Radium-226/228	5 pCi/L
Selenium	50 ug/L
Thallium	2 ug/L

LEGEND

- BACKGROUND MONITORING WELL
- JCW LANDFILL MONITORING WELL
- LEACHATE HEADWELL
- DECOMMISSIONED MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- NO EXCEEDANCES
- TWO OR MORE EXCEEDANCES (NOTES 5 & 6)
- STATISTICALLY SIGNIFICANT GWPS EXCEEDANCE (NOTE 7)
- SLURRY WALL (APPROXIMATE)
- APPROXIMATE WATER-BEARING UNIT BOUNDARY

WELL ID
CONSTITUENT(S) EXCEEDING GWPS

* GWPS EXCEEDANCE TRIGGERING ASSESSMENT OF CORRECTIVE MEASURES PURSUANT TO §257.96

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (10/3/2022).
2. MONITORING WELL AND SLURRY WALL LOCATIONS PROVIDED BY CEC; SG21733SHT2 REVB.DWG DATED 11/21/2018
3. THE JC WEADOCK BOTTOM ASH POND CCR UNIT WAS CERTIFIED AS CLOSED IN ACCORDANCE WITH *40 CFR 257.102(C) CLOSURE BY REMOVAL OF CCR* IN NOVEMBER 2023.
4. GWPS IS THE HIGHER OF THE MCL/RSL, APPLICABLE MICHIGAN PART 201 CRITERIA, AND UTL AS ESTABLISHED IN TRC'S TECHNICAL MEMORANDUM DATED APRIL 23, 2021.
5. GROUNDWATER DATA FROM AUGUST 2022 TO MAY 2024 ARE SCREENED AGAINST THE GWPS FOR EVALUATION PURPOSES ONLY. AN EXCEEDANCE IS DEFINED AS A SINGLE DETECTION ABOVE THE GWPS, HOWEVER, CONFIDENCE INTERVALS WILL BE USED TO DETERMINE COMPLIANCE PER THE CCR RULES.
6. AN EXCEEDANCE OF THE GWPS DOES NOT INDICATE UNACCEPTABLE RISK FROM GROUNDWATER EXPOSURE; THE DRINKING WATER PATHWAY IS NOT COMPLETE ON THE PROPERTY. GROUNDWATER CONDITIONS CONTINUE TO BE MONITORED TO INFORM THE JCW LANDFILL REMEDY SELECTION.
7. LOWER CONFIDENCE LIMIT IS ABOVE GWPS.
8. ALTERNATE SOURCE DEMONSTRATION INCLUDED IN THE SEMIANNUAL PROGRESS REPORT (CONSUMERS ENERGY, JULY 2024).

0 600 1,200 Feet

1 " = 600 '
1:7,200

N

PROJECT:
CONSUMERS ENERGY COMPANY
JC WEADOCK POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE:
NATURE AND EXTENT SUMMARY GWPS EXCEEDANCES

DRAWN BY:	E. YPSILANTIS	PROJ NO.:	367389.0001
CHECKED BY:	K. LOWERY		
APPROVED BY:	D. LITZ		**FIGURE 1**
DATE:	JULY 2024		

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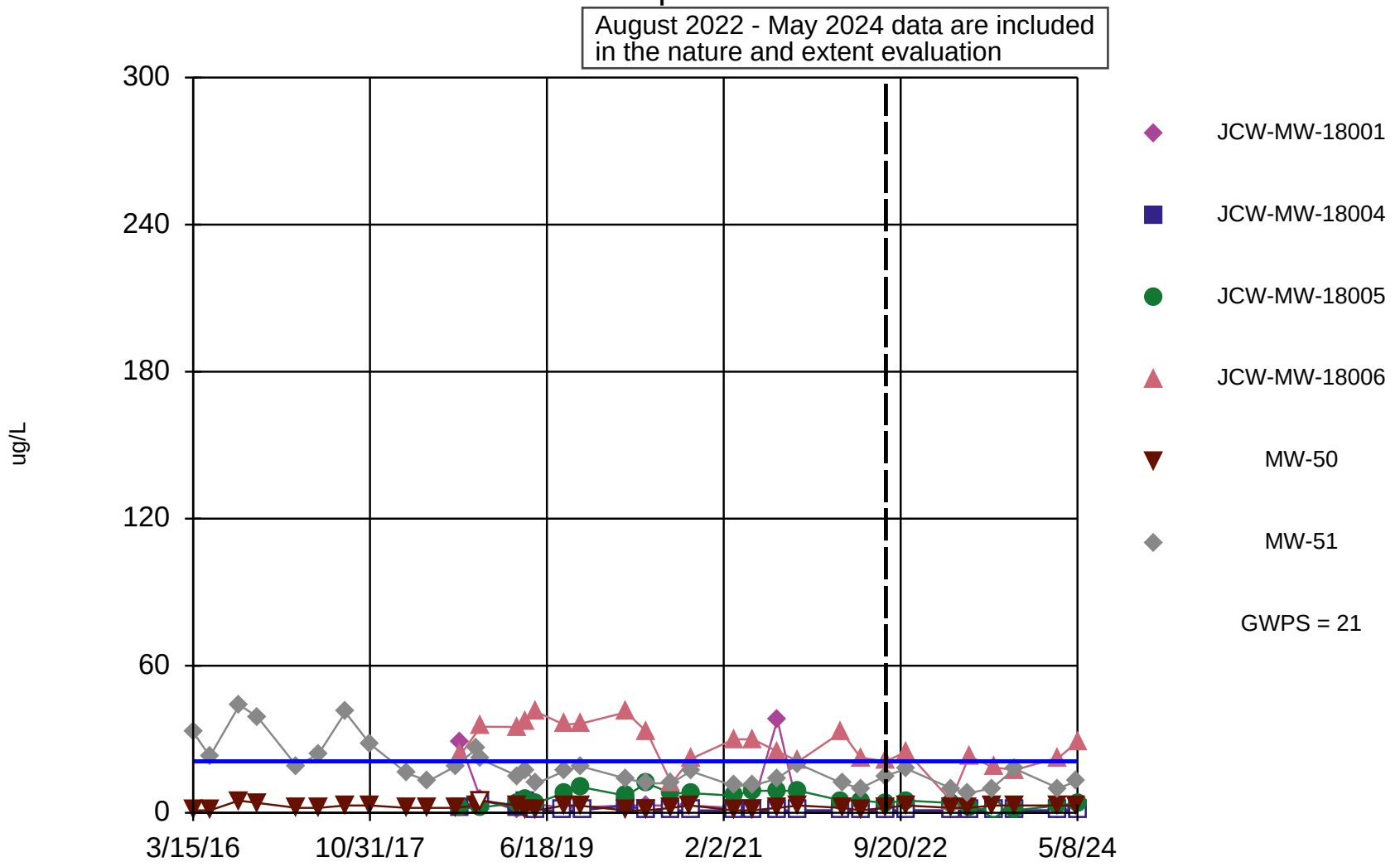
FILE NO.: 418426-ExceedancesNE_GWPS_20240725.mxd

Attachment A
Time Series Graphs

Hollow symbols indicate censored values.

Arsenic Comparison to GWPS



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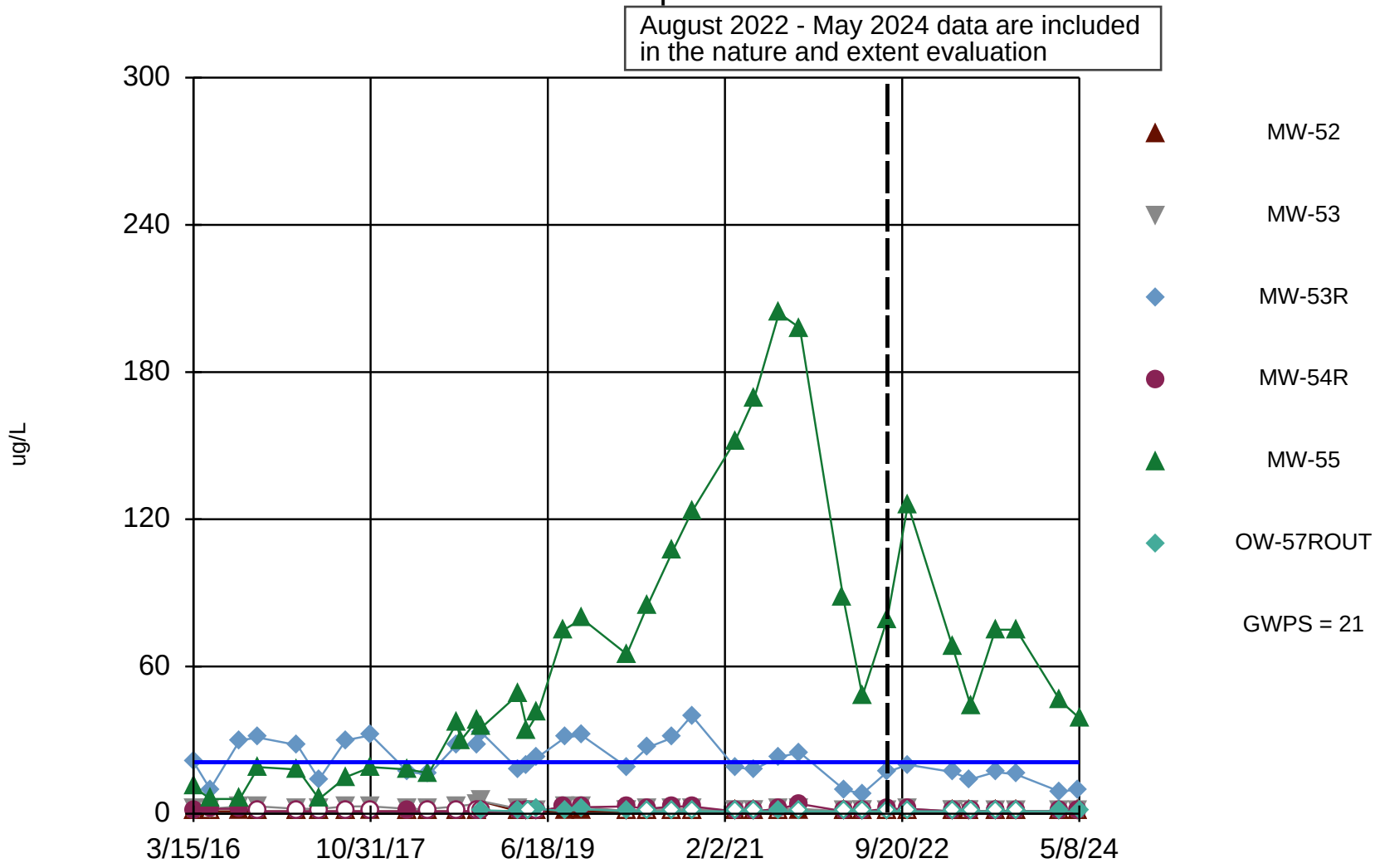
Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2

Hollow symbols indicate censored values.

Arsenic Comparison to GWPS



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Client: Consumers Energy Data: JCW_HMPCCR_Sanitas_24Q2