

July 29, 2022

#### TRANSMITTAL VIA EMAIL 07/29/2022

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,

Consumers Energy prepared and submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) a closure work plan for the Weadock Bottom Ash Pond (Weadock Bottom Ash Pond Work Plan) and a Response Action Plan developed for the Weadock Bottom Ash Pond and Weadock Landfill in accordance with Part 115 dated November 30, 2018 and March 15, 2019, respectively. These plans were developed in anticipation of supporting the Assessment of Corrective Measures that would be necessary for evaluating and selecting a remedy for the Weadock Bottom Ash Pond and Weadock Landfill. Consumers Energy provided notification of exceeding a Groundwater Protection Standard (GWPS) per §257.95(g), which documented beryllium and lithium were present at statistically significant levels above the GWPS in one downgradient well at the Weadock Bottom Ash Pond and arsenic was present at one downgradient monitoring well in the original Weadock Landfill groundwater monitoring system on January 14, 2019.

EGLE approved the Weadock Bottom Ash Pond Work Plan on December 20, 2018 based on expectation that a report documenting the removal activities and certifying solid waste has been removed in accordance with the work plan would be submitted at the completion of activities. Subsequently, EGLE approved the Response Action Plan on May 14, 2019 based on the anticipated submittal of the Assessment of Corrective Measures. Consumers Energy has completed the excavation activities described in the Weadock Bottom Ash Pond Work Plan and submitted a final excavation certification report on August 31, 2020 to satisfy requirements for completing the removal of solid waste which rendered the need for a solid waste operating license was unnecessary. This final excavation report documenting removal of solid waste was approved by EGLE on November 30, 2020.

For the Weadock Bottom Ash Pond, closure by removal has been achieved pursuant to 324.11519b(9)(b) by documenting the removal of sources of contamination under the response action plan. However, residual groundwater constituent concentrations exceeding the GWPS pursuant to 40 CFR 257.95(h) for arsenic have persisted after the source removal activities were completed. EGLE has approved a remedy consistent with R 299.4444 and R 299.4445 of the part 115 rules through the approval of the DE Karn Hydrogeological Monitoring Plan, Rev. 03 that includes the determination of Groundwater Not in an Aquifer and groundwater mixing zone authorization. Additional steps needed to address residual groundwater contamination are discussed in the observations and results sections below.

JC Weadock Semiannual Progress Report Ms. Lori Babcock July 29, 2022



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

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 in pursuant to 257.102(d) once the detail engineering is completed by December 31, 2022.

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 Bottom Ash Pond and Weadock Landfill after the completion of the Assessment of Corrective Measures, JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Unit, dated September, 11, 2019 (Weadock ACM) (TRC, 2019). Groundwater management alternatives considered to be technically feasible following source removal activities for the Weadock Bottom Ash Pond 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. These groundwater corrective strategies also apply to the Weadock Landfill upon completing source containment through the construction of the soil-bentonite slurry wall and construction of an impermeable final cover system.

#### Results of May 2022 Sampling Event

Statistical analysis from the May 2022 semiannual groundwater monitoring event verified that there were no constituents of concern (i.e., beryllium and lithium [Weadock Bottom Ash Pond], arsenic [Weadock Landfill]) present at statistically significant levels above the established Groundwater Protection Standard (GWPS) within the Weadock Bottom Ash Pond or Weadock Landfill groundwater monitoring system. Results are presented in the enclosed May 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, JC Weadock Site, Bottom Ash Pond CCR Units (May 2022 Event Summary) (TRC, 2022a) and 2022 Semiannual Groundwater Monitoring Report and Second Quarter 2022 Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal Area (2Q2022 Quarterly Monitoring Report) (TRC, 2022b). 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:



- Beryllium and lithium are no longer present at statistically significant levels and the lower confidence limit for all Appendix IV constituents have been below their respective GWPSs since May 2019 in the Weadock Bottom Ash Pond groundwater monitoring system;
- No additional Appendix IV constituents have been observed at statistically significant levels above GWPS for the Weadock Bottom Ash Pond or Weadock Landfill groundwater monitoring systems;
- 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.; and
- Arsenic and molybdenum concentrations at monitoring well MW-55 have been reviewed through an Alternate Source Demonstration provided in Appendix G of the <a href="2021 Semiannual Groundwater Monitoring Report">2021 Semiannual Groundwater Monitoring Report</a> and Fourth Quarter 2021 Hydrogeological Monitoring Report; <a href="JC Weadock Solid Waste Disposal Area">JC Weadock Solid Waste Disposal Area</a> (TRC, January 2022) indicating elevated levels of constituents at that location are not related to materials management within the Weadock Landfill. It is noteworthy that the <a href="2022 Semiannual Groundwater Monitoring Report and Second Quarter 2022 Hydrogeological Monitoring Report JC Weadock Solid Waste Disposal Area">2022 Hydrogeological Monitoring Report JC Weadock Solid Waste Disposal Area</a> (TRC, July 2022) the direct comparison for arsenic observed at 48 ug/L (highest concentration observed 204 ug/L in August 2021) and molybdenum at 78 ug/L (highest concentration observed 216 ug/L in August 2019) with each of these constituents demonstrating a downward concentration trend in 2022.

#### **Conclusions**

Source removal activities for the Weadock Bottom Ash Pond have been completed and documented in the Weadock Bottom Ash Pond Closure Report dated August 28, 2020 and approved by EGLE on November 30, 2020. The Appendix IV constituents that have triggered corrective action, beryllium and lithium, have been documented to have constituent concentrations reduced to beneath their respective GWPS since source removal activities were completed. Consumers Energy will begin developing the remedy selection materials in anticipation of a public meeting to review the source removal activities, results since source removal activities were completed, and remedy recommendation based on the results-to-date. Sampling events completed since source removal activities were completed indicate that a monitoring-only remedial option has a high likelihood of meeting performance objectives for clean closure under §257.102(c) and remedy selection under §257.97.

Additionally, the Weadock Bottom Ash Pond is located with the licensed acreage of the Weadock Solid Waste Disposal Area. Now that the final closure plan for the Weadock Landfill has been approved by EGLE, Consumers Energy can also proceed with the recommendations for the final long-term stewardship of acreage outside of the soil-bentonite slurry wall that is included within the licensed acreage, inclusive of the former Weadock Bottom Ash Pond. 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 groundwater-surface water interface (GSI)



pathway 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 Bottom Ash Pond and 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, 2023. Please feel free to contact me with any questions or clarifications.

Sincerely,

Harold D. Register, Jr., P.E.

Principal Engineer

Landfill Operations Compliance

Phone: (517) 788-2982

Email: <u>harold.registerjr@cmsenergy.com</u>

cc: Mr. Phil Roycraft, EGLE Saginaw Bay District Office

Mr. Mike Quigg, EGLE Saginaw Bay District Office

Ms. Margie Ring, EGLE Lansing Office Mr. Jim Arduin, EGLE Lansing Office

Mr. Caleb Batts, Consumers Energy

Ms. Darby Litz, TRC

Mr. Jacob Krenz, TRC

Enclosures: First Quarter 2022 Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal

Area. (TRC, April 29, 2022).

May 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers

Energy, JC Weadock Site, Bottom Ash Pond CCR Units. (TRC, July 29, 2022a).

2022 Semiannual Groundwater Monitoring Report and Second Quarter 2022

Hydrogeological Monitoring Report, JC Weadock Solid Waste Disposal Area. (TRC, July

29, 2022b).

First Semiannual 2022 Nature and Extent Data Summary, JC Weadock, Consumers

Energy. (TRC, July 29, 2022b).



# First Quarter 2022 Hydrogeological Monitoring Report

JC Weadock Solid Waste Disposal Area

**Essexville**, Michigan

April 2022

Darby Litz/

Project Manager/Hydrogeologist

# **Prepared For:**

Consumers Energy 1945 W. Parnall Road Jackson, MI 49201

# Prepared By:

TRC 1540 Eisenhower Place Ann Arbor, Michigan 48108

Kristin Lowery, E.I.T. Project Engineer



# **TABLE OF CONTENTS**

1.0	Intro	oduction	1
	1.1	Statement of Adherence to Approved Hydrogeological Monitoring Plan	1
	1.2	Program Summary	1
	1.3	Site Overview	3
	1.4	Geology/Hydrogeology	3
2.0	Lead	chate Monitoring	5
3.0	Grou	undwater Monitoring	6
	3.1	Monitoring Well Network	6
	3.2	February/March 2022 Monitoring Event	7
		3.2.1 Data Quality Review	8
	3.3	Groundwater Flow Rate and Direction	8
	3.4	Groundwater Analytical Data and Relevant Screening Criteria	9
		3.4.1 Groundwater Monitoring Analytical Results	10
		3.4.2 Detection Monitoring	10
		3.4.3 Assessment Monitoring Data Evaluation	11
		3.4.3.1 Establishing Groundwater Protection Standards	11
		3.4.3.2 Data Comparison to Groundwater Protection Standards	11
		3.4.4 GSI Compliance Monitoring	12
	3.5	Alternate Source Demonstration	13
		3.5.1 Monitoring Well JCW-MW-18001: Sulfate	13
		3.5.2 Monitoring Well MW-55: Arsenic and Molybdenum	14
4.0	Con	clusions and Recommendations	15
5.0	Refe	erences	16
TAB	LES		
Table	1	Summary of Groundwater Elevation Data: February 2022	
Table	2	Summary of Groundwater Sampling Results (Analytical): March 2022; JC	
Table	٠ 3	Weadock Solid Waste Disposal Area Summary of Field Parameters: March 2022	
Table		Summary of Confidence Interval Evaluation: March 2022	
Table	5	Mass Flux Calculations	
Table		Synthetic Precipitation Leaching Procedure Results	
Table Table		Leachate Headwell Results EGLE Exceedance Summary Table	
1 abic	, 0	LOLL Exposuration Sufficiently Tubic	



#### **FIGURES**

Figure 1 Site Location Map

Figure 2 Site Map

Figure 3 Potentiometric Surface Map – February 2022

#### **APPENDICES**

Appendix A Static Water Level Evaluation

Appendix B Data Quality Review

Appendix C Detection Monitoring Statistical Trend Tests

Appendix D Assessment Monitoring and GSI Statistical Evaluation

Appendix E Laboratory Analytical Report

Appendix F Field Records

Appendix G Alternate Source Demonstration Supporting Information

Appendix H Well Decommissioning and Installation Records



#### 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 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). 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, 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 2022 JC Weadock Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring 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 approved 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 2022 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 the 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 in order 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, 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, was 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 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 under this revised plan 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. The Weadock Landfill HMP includes laboratory leachate testing, which consists of four dry-handled Coal Combustion Residual (CCR) samples collected under normal plant operating conditions during the active life of the landfill. Laboratory leachate data for the four dry-handled CCR samples are shown in Table 6. The 2022 laboratory leachate data are generally consistent with data collected in previous years.

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-103 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.

Leachate headwell LH-103 was decommissioned in March 2022 due to damage noted in Q4 2021. LH-103R was installed in March 2022 as a replacement and is shown on Figures 2 and 3. Well decommissioning and installation records are included in Appendix H. The location of LH-103R was selected to provide representative field leachate concentrations with considerations for accessibility during current and future landfill construction activities. Since field leachate data were not able to be collected from LH-103 during the Q4 2021, leachate headwell LH-103R was sampled in Q1 2022 and results are shown in Table 7. The February 2022 field leachate data for LH-103R are generally consistent with data collected in previous years from LH-103 and LH-104.

Concentrations of low-level mercury in LH-103R were detected at 2.25 ng/L which is above the GSI criterion of 1.3 nanograms per liter (ng/L); however, concentrations of mercury in the leachate headwell remain well below 200 ng/L (0.2 ug/L), which is the quantification level allowed per EGLE Policy 09-014 dated June 20, 2012. Mercury analysis occurs quarterly at the porewater monitoring compliance well locations and mercury has not been detected above 200 ng/L; therefore, the result in LH-103R is considered a *de minimis* condition pursuant to Section 20120e of Part 201.



# 3.0 Groundwater Monitoring

# 3.1 Monitoring Well Network

The groundwater monitoring system presented in the HMP has been established in accordance with R 299.4906 and the CCR Rule §257.91, which consists of 16 monitoring wells (four background monitoring wells and 12 downgradient monitoring wells) 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 will 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 (11) 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 INOW-61OW-63

# 3.2 February/March 2022 Monitoring Event

In accordance with the Weadock Landfill HMP, TRC conducted the first quarter 2022 monitoring event for the Weadock Landfill on February 28 through March 11, 2022. Groundwater monitoring was performed in accordance with the Weadock Landfill HMP. 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					
рН	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 first quarter 2022 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 one field blank, one equipment blank, two field duplicates (JCW-MW-18005 and MW-50), and field matrix spike/matrix spike duplicate samples collected at 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 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 initiated 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 quarterly 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 2.

Groundwater elevations measured at the site in February 2022 are generally within the range of 580 to 599 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 MW-50, MW-51, MW-52, MW-53, MW-53R, 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 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. The groundwater monitoring system is structured such that there are eleven (11) 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. 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 A-2 of Appendix A.

#### 3.4 Groundwater Analytical Data and Relevant Screening Criteria

Groundwater analytical data are evaluated in accordance with the Weadock Landfill HMP for the purposes of solid waste license compliance as well as to determine compliance with applicable generic GSI and site-specific GSI mixing zone-based criteria. Data are evaluated by using a combination of screening against relevant criteria, as well as utilizing statistical analyses.

Analytical results from the first quarter 2022 monitoring event are included in the attached laboratory report (Appendix E). Groundwater analytical data from the first quarter 2022 monitoring event are summarized in Table 2, as well as the associated Part 201 generic GSI and site-specific mixing-zone GSI criteria. Field data are summarized in Table 3.

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 3.4.4 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 8 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 GSI criteria (within the last four quarters) are included.



#### 3.4.1 Groundwater Monitoring Analytical Results

Groundwater monitoring is being conducted under Weadock Landfill HMP, which provides for sampling at historic wells (MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, and MW-55) along with wells that were newly installed in 2018 (OW-57R OUT, JCW-MW-18001, JCW-MW-18004, JCW-MW-18005, and JCW-MW-18006). Data for these wells are tabulated in Table 2.

Analytical results for these wells are being evaluated 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 3.4.2 Detection Monitoring and Section 3.4.3 Assessment Monitoring). Additionally, analytical results for these wells are being evaluated in support of GSI compliance. GSI criteria only apply to the designated compliance point as specified in Section 3.4.4 below; however, analytical results and data trends in groundwater collected from the perimeter dike wells are evaluated to identify potential GSI compliance issues.

## 3.4.2 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 3.1, demonstrates that the slurry wall is performing as designed.

Analytical data for the detection monitoring program are tabulated in Table 2. In addition to the comparison of analytical data to relevant screening criteria, statistical trend analyses are used to evaluate groundwater quality each quarter. Consumers Energy manages and evaluates its groundwater data using Sanitas<sup>TM</sup> 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 slope was statistically significant. Trend analyses could be completed for the first time for constituents that were added to the monitoring program by the Weadock Landfill HMP (i.e., calcium, chloride, fluoride, and total dissolved solids), as the monitoring wells had a sufficient amount of data to perform trend analysis (i.e., a minimum of eight sampling events).

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

Boron concentrations are trending upward at several monitoring wells. The previously observed increasing trend at MW-54R has continued and the increasing trend initially observed for MW-55 in fourth quarter 2021 was confirmed in the first quarter 2022. New, unconfirmed increasing trends for boron were observed at MW-50, MW-51, MW-53, MW-53R, and OW-57R Out in first quarter 2022.



- A new, unconfirmed increasing trend for chloride was observed at MW-54R in first quarter 2022.
- The new, unconfirmed increasing trends for iron at MW-53R and MW-55 that were observed in fourth quarter 2021 were not confirmed in first quarter 2022.
- A new, unconfirmed increasing trend for calcium was observed at JCW-MW-18001 in first quarter 2022.
- A continuous increasing trend was observed for sulfate at JCW-MW-18001. Sulfate concentrations remain below the generic final acute value (FAV).
- A new, unconfirmed increasing trend for total dissolved solids (TDS) was observed at JCW-MW-18001 in first quarter 2022.

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 and chloride, may be a result of changes in lake levels rather than a change in flux from the landfill and will continue to be evaluated. Sulfate concentrations are related to redox conditions and the increasing trend of sulfate is attributed to localized changes in geochemistry near JCW-MW-18001 as a result of changing water levels, rather than a change in flux from the landfill, as discussed further in Section 3.5. Consumers is further evaluating the cause of the increasing boron concentrations at several porewater compliance monitoring wells. 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 3.4.3.2. Continued monitoring and assessment for potential future actions is warranted at this time; however, observed concentrations of boron in each of the monitoring wells is less than the relevant Part 115 compliance standard - the GSI pathway standard (Section 3.4.4).

# 3.4.3 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 C (Assessment Monitoring and GSI Statistical Evaluation of the March 2022 Sampling Event). A summary of the confidence interval evaluation is provided in Table 4.

#### 3.4.3.1 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, April 2021). 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.

#### 3.4.3.2 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 2022 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, and OW-57R OUT were present at statistically significant levels above the GWPS. The GWPS for boron was 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. Concentrations of boron below relevant GSI criteria, as discussed in Section 3.4.4.

Assessment Monitoring Constituents (Part 115 and Federal CCR): Based on the first quarter 2022 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 9.37 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.

# 3.4.4 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 2022 data from the GSI monitoring points are tabulated in Table 2. 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 (Assessment Monitoring and GSI Statistical Evaluation of the March 2022 Sampling Event). 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, and OW-57R. 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. The statistical evaluation presented in Appendix D shows that the lower confidence limit of the arsenic and molybdenum data over the past 8 events did not exceed the GSI criteria. 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. The calculated mass-flux loading for arsenic and molybdenum based upon the contribution from each GSI compliance point with respect to the total flux observed in the mixing zone has been evaluated and compared to the chronic loading limits (Table 5). Compliance with the GSI pathway criteria on a mass flux basis is supported by the calculations in Table 5 that show the estimated mass flux of arsenic (9.4 x 10<sup>-6</sup> lbs/day) and molybdenum (1.7 x 10<sup>-5</sup> lbs/day) are less than the loading limits of 3.2 x 10<sup>-4</sup> lbs/day and 3.8 x 10<sup>-4</sup> lbs/day, respectively, based on the generic GSI criterion for molybdenum and the site-specific chronic mixing zone GSI criterion for arsenic.

#### 3.5 Alternate Source Demonstration

#### 3.5.1 Monitoring Well JCW-MW-18001: Sulfate

Although confirmed increasing trends were observed at JCW-MW-18001 for sulfate (through Q1 2022), the potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill (Appendix A) and these trends are not indicative of a new release from the landfill. Increases of sulfate 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 presenting an Alternate Source Demonstration for these constituents. Additional time series charts are included in Appendix G to illustrate the correlation between the increased concentrations and the changing water levels.

Dissolved oxygen at JCW-MW-18001 is currently higher than what was observed from 2018 to 2019 (Figure G1). Sulfate is used as an oxidizing agent when oxygen is not present. As groundwater is transitioning to a more oxygenated state from the rising adjacent surface water level, less sulfate is being reduced as an electron acceptor, causing increasing concentrations (i.e. less sulfate is being reduced to sulfide/sulfite/elemental sulfur, so the amount of sulfate present increases). Surface water and groundwater levels are now decreasing; however, it may take time for the local geochemistry to re-equilibrate to lowered water levels and dissolved oxygen remains elevated compared to prior years.



 Sulfate concentrations at JCW-MW-18001 (1,080 mg/L) are much higher than sulfate concentrations previously observed on the inside of the slurry wall at JCW-OW-18001 (86.8 mg/L in second quarter 2021), which further supports that the landfill is not the source of sulfate.

# 3.5.2 Monitoring Well MW-55: Arsenic and Molybdenum

Additionally, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD) for a arsenic and of 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, Table G2 shows concentrations of arsenic, boron, and molybdenum within the landfill (OW-55, JCW-OW-18004 and LH-104) are noticeably different than arsenic and molybdenum concentrations observed in MW-55. Arsenic and molybdenum concentrations are generally much lower inside the slurry wall and boron concentrations are much higher.
- Conservative Tracer Boron is a metalloid known to be present in coal ash and can be used as a conservative tracer in groundwater. Concentrations of boron in Leachate Headwell LH-104 are significantly higher than concentrations observed at any of the other location sampled as a part of this ASD. Additionally, boron concentrations at MW-55 have decreased since 2010 and have been relatively stable, as evidenced by the time series plots in Figure G2. Stable or decreasing concentrations of boron is 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 for MW-55, as shown in Appendices A and G, are increased over 4-ft since 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.



#### 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 2022 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 *2021 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 2022 data in accordance with the Weadock Landfill HMP demonstrate that boron is present at concentrations above the GWPS. Boron is a detection monitoring (i.e., Appendix III) constituent that does 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. Concentrations of boron are below relevant GSI criteria, as discussed in Section 3.4.4.

The statistical evaluation in first quarter 2022 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 2022.



#### 5.0 References

- AECOM. November 6, 2009. Potential Failure Mode Analysis (PFMA) Report. JC Weadock Electric Generation Facility Ash Dike Risk Assessment Essexville, Michigan. Prepared for Consumers Energy Company
- Consumers Energy Company. 2015. *Hydrogeological Monitoring Plan Rev. 2: JC Weadock Solid Waste Disposal Area.* June 9.
- Consumers Energy. 2019. JC Weadock Landfill Response Action Plan Submittal, JC Weadock Generating Facility (WDS# 395457), Essexville, Michigan. March 15.
- Golder Associates, Inc. 2018. J.C. Weadock Generating Facility, Slurry Wall Vent Closure Construction Documentation Report. October 30.
- Michigan Department of Natural Resources (MDNR). 1986. *Determination of Permit Exemption No. GWE-0005*. August 25.
- Michigan Department of Environmental Quality (MDEQ). 2015. *Implementation of a Mixing Zone Request Consumers Energy DE Karn/JC Weadock Complex*. December 23.
- MDEQ. 2018. Slurry Wall Construction Certification; JC Weadock Landfill, Bay County, Michigan, Waste Data System Number 395457. December 19.
- Michigan Department of Environment, Great Lakes, and Energy (EGLE). 2020. Closure Certification, Consumers Weadock Complex (Weadock) Bottom Ash Pond, Bay County, Waste Data System No. 395457. November 30. [Letter]
- Natural Resource Technology. 2005. Phase II Groundwater Discharge Evaluation, Final Report.
- Natural Resource Technology. 2010. Revised Hydrogeological Monitoring Plan JC Weadock Solid Waste Disposal Area.TRC. 2018. Annual Groundwater Monitoring Report JC Weadock Power Plant, Landfill CCR Unit. Prepared for Consumers Energy Company. January.
- TRC. 2018. Annual Groundwater Monitoring Report JC Weadock Power Plant, Landfill CCR Unit. Prepared for Consumers Energy Company.
- TRC. 2019a. 2018 Annual Groundwater Monitoring Report JC Weadock Power Plant Landfill CCR Unit. Prepared for Consumers Energy Company. January.
- TRC. 2019b. Assessment of Corrective Measures JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Units. Prepared for Consumers Energy Company. September.
- TRC. 2020. 2019 Annual Groundwater Monitoring Report JC Weadock Power Plant Landfill CCR Unit. Prepared for Consumers Energy Company. January.



- TRC. 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residuals (CCR) Units. Prepared for Consumers Energy Company. January.
- TRC. 2021. Landfill Hydrogeological Monitoring Plan JC Weadock Power Plant, Essexville, Michigan. Prepared for Consumers Energy Company. February.
- TRC. 2021. First Quarter 2021 Hydrogeological Monitoring Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan. Prepared for Consumers Energy Company. April.
- USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.
- USEPA. 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 80 Federal Register 74 (April 17, 2015), pp. 21301-21501 (80 FR 21301). April
- USEPA. 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435). July.



# Summary of Groundwater Elevation Data: Februrary 2022 First Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

	тос		Screen Interval	Februar	y 28, 2022
Well Location	Elevation (ft)	Geologic Unit of Screen Interval	Elevation (ft)	Depth to Water	Groundwater Elevation
				(ft BTOC)	(ft)
Background Monitorii	ng Wells				
MW-15002	587.71	Sand	580.9 to 570.9	6.80	580.91
MW-15008	585.36	Sand with clay	578.7 to 568.7	4.53	580.83
MW-15016	586.49	Sand	581.2 to 578.2	NM	NM
MW-15019	586.17	Sand and Sand/Clay	579.5 to 569.5	5.75	580.42
Bottom Ash Pond: Do	wngradient Monito	oring Wells	•		•
JCW-MW-15007	587.40	Sand	582.7 to 579.2	3.55	583.85
JCW-MW-15009	589.64	Sand	581.9 to 576.9	9.28	580.36
JCW-MW-15010	597.76	Sand	579.7 to 578.2	17.60	580.16
JCW-MW-15028	589.64	Sand	567.7 to 564.7	8.00	581.64
Landfill: Downgradier	nt Monitoring Wells	s (outside slurry wall)			
JCW-MW-18001	596.73	Sand and Sandy Clay	578.3 to 573.3	17.00	579.73
JCW-MW-18004	593.04	Sandy Clay	583.9 to 578.9	13.19	579.85
JCW-MW-18005	590.89	Sand and Sandy Clay	580.0 to 575.0	9.88	581.01
JCW-MW-18006	600.72	Fly Ash and Sandy Clay	582.8 to 577.8	14.80	585.92
MW-50	593.36	Sand	577.8 to 574.8	13.63	579.73
MW-51	594.29	Sand and Clay	577.8 to 574.8	14.68	579.61
MW-52	594.90	Sand	579.3 to 576.3	15.23	579.67
MW-53	593.68	Sand and Clay	579.1 to 576.1	13.89	579.79
MW-53R	594.25	Sand and Clay	580.4 to 575.4	14.95	579.30
MW-54R	593.89	Clay and Sand	581.3 to 576.3	14.10	579.79
MW-55	593.82	Sand	581.5 to 578.5	14.35	579.47
OW-57ROUT	591.00	Sandy Clay	577.0 to 572.0	9.90	581.10
Landfill: Static Water	Level Only (inside				
JCW-OW-18001	595.84	Fly Ash and Sand	581.1 to 576.1	8.70	587.14
JCW-OW-18002	593.63	Sand	578.9 to 573.9	11.15	582.48
JCW-OW-18003	593.99	Sand and Clay	580.5 to 575.5	8.68	585.31
JCW-OW-18004	594.19	Sandy Clay	584.6 to 579.6	7.48	586.71
JCW-OW-18006	600.61	Fly Ash and Clay with Sand	582.9 to 577.9	12.68	587.93
MW-20	592.73	NR	~581.1 to ~578.1	7.00	585.73
OW-51	593.62	Clay and Sand	578.9 to 575.9	10.24	583.38
OW-53	593.64	Clay and Sand	579.0 to 576.0	8.36	585.28
OW-54	594.10	Clay and Sand	580.0 to 577.0	7.62	586.48
OW-55	594.67	Clay (or Sand and Clay)	580.9 to 577.9	5.83	588.84
OW-56R	592.01	Ash and Sand	577.5 to 572.5	5.89	586.12
OW-57R IN	590.86	Sandy Clay	575.7 to 570.7	6.74	584.12
OW-61	612.37	Ash and Sand	588.0 to 585.0	13.24	599.13
OW-63	612.53	Ash and Sand	594.2 to 591.2	NM	NM
Landfill: Leachate Hea	adwells				
LH-103R	612.70	Fly Ash	25.0 to 30.0	24.85 <sup>(1)</sup>	587.85
LH-104	596.56	Fly Ash	8.0 to 11.0	8.33	588.23

#### 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 NM: Not Measured

NI:Not Installed; NM: Not Measured; NR: Not Recorded

 $^{\rm (1)}$  LH-103R water level measurment was collected on 3/11/2022.

# Summary of Groundwater Sampling Results (Analytical): March 2022 First Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

							Sample Location:	JCW-MW-18001	JCW-MW-18004	JCW-MW-18005	JCW-MW-18006	MW-50	MW-51
	1		1			Chronic-Based	Sample Date: Acute-Based	3/7/2022	3/7/2022	3/7/2022	3/7/2022	3/8/2022	3/8/2022
				MI Non-		Mixing Zone GSI	Mixing Zone GSI	Danis and d'aut	Downgradient/	Danis and diam	Danier d'aut	Downgradient/	Downgradient/
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^	Criteria^	Criteria^	Downgradient	ĞSI	Downgradient	Downgradient	ĞSI	ĞSI
	Offic	EFA WICL	IVII Resideriliai	Residential	IVII GSIA	Cillena	Cillena						
Appendix III <sup>(1)</sup>													
Boron	ug/L	NC	500	500	7,200	44,000	69,000	1,670	259	1,030	3,220	1,610	1,420
Calcium	mg/L	NC	NC	NC	500 <sup>EE</sup>	NC	NC	412	236	159	143	186	255
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500	NC	NC	60	19.6	61.7	75	54.9	91.1
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500EE	NC	NC	1,080	537	204	38.1	346	446
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	NC	NC	2,310	1,280	942	792	999	1,480
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	NC	NC	6.8	6.9	7.1	7.1	7.4	7.4
Appendix IV <sup>(1)</sup>													
Antimony	ug/L	6	6.0	6.0	130	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	100	680	< 1	< 1	5	33	2	12
Barium	ug/L	2,000	2,000	2,000	670	NC	NC	129	32	108	665	115	198
Beryllium	ug/L	4	4.0	4.0	6.7	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.0	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	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000
Lead	ug/L	NC	4.0	4.0	29	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	NC	NC	87	34	32	63	77	58
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	3.200	NC	NC	< 5	< 5	5	< 5	6	< 5
Selenium	ug/L	50	50	50	5.0	55	120	2	2	3	2	2	3
Thallium	ug/L	2	2.0	2.0	3.7	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 11	,	_				112						· <del>-</del>	
Iron	ug/L	300**	300E	300 <sup>E</sup>	500,000EE	NC	NC	86	952	3,300	9,040	1,400	1,310
Copper	ug/L	1,000**	1,000 <sup>E</sup>	1,000 <sup>E</sup>	NC	NC NC	NC NC	2	1	< 1	< 1	< 1	< 1
Nickel	ug/L	NC	100	100	NC	NC	NC	6	4	10	6	< 2	< 2
Silver	ug/L	100**	34	98	NC NC	NC NC	NC NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	NC NC	NC NC	NC NC	< 2	< 2	< 2	4	< 2	< 2
Zinc	ug/L	5,000**	2,400	5.000E	NC NC	NC NC	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.

C - no criteria

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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.
- <sup>E</sup> Criterion is the aesthetic drinking water value per footnote {E}.
- $^{\mbox{\scriptsize EE}}$  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 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. **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.

### Summary of Groundwater Sampling Results (Analytical): March 2022 First Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

							Sample Location:	MW-52	MW-53	MW-53R	MW-54R	MW-55	OW-57ROUT
							Sample Date:	3/8/2022	3/8/2022	3/8/2022	3/9/2022	3/7/2022	3/9/2022
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 <sup>(1)</sup>													
Boron	ug/L	NC	500	500	7,200	44,000	69,000	1,310	4,100	2,330	4,720	826	2,030
Calcium	mg/L	NC	NC	NC	500EE	NC	NC	251	146	188	186	163	126
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500	NC	NC	51.6	81.1	39.9	49.8	20.2	62.5
Fluoride	ug/L	4,000	NC	NC	NC	NC	NC	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500EE	NC	NC	654	39.5	71.7	67.1	35.4	83.1
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	NC	NC	1,520	768	709	776	808	1,030
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	NC	NC	7.1	7.4	7.1	6.9	7.1	7.2
Appendix IV <sup>(1)</sup>													
Antimony	ug/L	6	6.0	6.0	130	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	100	680	< 1	1	10	1	88	< 1
Barium	ug/L	2,000	2,000	2,000	670	NC	NC	170	401	203	154	299	85
Beryllium	ug/L	4	4.0	4.0	6.7	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	3.0	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	< 1000	< 1000	< 1000	< 1000	< 1000	< 1000
Lead	ug/L	NC	4.0	4.0	29	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	NC	NC	27	48	56	74	28	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	3,200	NC	NC	< 5	< 5	< 5	7	89	8
Selenium	ug/L	50	50	50	5.0	55	120	2	3	2	2	1	1
Thallium	ug/L	2	2.0	2.0	3.7	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 11	5 <sup>(2)</sup>												
Iron	ug/L	300**	300 <sup>E</sup>	300 <sup>E</sup>	500,000EE	NC	NC	2,870	1,130	1,080	496	29,800	96
Copper	ug/L	1,000**	1,000 <sup>E</sup>	1,000 <sup>E</sup>	NC	NC	NC	1	< 1	2	1	< 1	2
Nickel	ug/L	NC	100	100	NC	NC	NC	< 2	< 2	< 2	< 2	4	17
Silver	ug/L	100**	34	98	NC	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	NC	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	5,000**	2,400	5,000 <sup>E</sup>	NC	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

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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.
- <sup>E</sup> Criterion is the aesthetic drinking water value per footnote {E}.
- $^{\mbox{\scriptsize EE}}$  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 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. **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 3

#### Summary of Field Parameters: March 2022 First Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen	Oxidation Reduction Potential	рН	Specific Conductivity	Temperature	Turbidity
		(mg/L)	(mV)	(SU)	(umhos/cm)	(°C)	(NTU)
JCW Landfill							
JCW-MW-18001	3/7/2022	1.03	-200.0	6.8	2,982	10.4	2.0
JCW-MW-18004	3/7/2022	4.99	-25.8	6.9	1,691	3.6	3.0
JCW-MW-18005	3/7/2022	1.29	-108.5	7.1	1,410	6.1	14.0
JCW-MW-18006	3/7/2022	0.99	-151.5	7.1	1,385	7.7	1.8
MW-50	3/8/2022	1.19	-149.8	7.4	1,508	7.5	5.0
MW-51	3/8/2022	1.38	-119.5	7.4	2,100	6.4	3.0
MW-52	3/8/2022	0.90	-140.0	7.1	2,034	7.4	5.0
MW-53	3/8/2022	1.28	-129.0	7.4	1,360	6.8	2.0
MW-53R	3/8/2022	1.29	-129.5	7.1	1,430	7.3	4.8
MW-54R	3/9/2022	1.90	-60.5	6.9	1,317	5.1	1.9
MW-55	3/7/2022	1.16	-139.5	7.1	1,453	6.0	3.0
OW-57ROUT	3/9/2022	4.95	-30.5	7.2	1,297	4.8	4.2

#### Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard Units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celcius.

NTU - Nephelmetric Turbidity Unit.

# Summary of Confidence Interval Evaluation: March 2022 First Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Assessment Moi	ssessment Monitoring Statistical Evaluation																									
Constituent	Units	GWPS	MW	/-50	MV	V-51	MV	V-52	MV	V-53	MW	-53R	MW	MW-54R MW-55		OW-57R OUT		JCW-MW-18001		JCW-MW-18004		JCW-MW-18005		JCW-MW-18006		
Constituent	Units	GWPS	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL
Boron	ug/L	560	1,700	1,300	1,200	790	1,300	1,100	4,100	2,600	2,100	1,400	6,200	1,700	880	550	2,200	1,700	1,700	1,300			1,200	980	3,100	2,300
Calcium	mg/L	280	380	190	340	270			180	90									480	280	310	230	320	150		
Sulfate	mg/L	780	1,100	510						-									1,300	580			550	170		
Arsenic	ug/L	21		-							34	15			(1)	(1)			38	0.50					33	18
Molybdenum	ug/L	73													(1)	(1)										
Iron	ug/L	28,000		-						-		-			41,000	21,000										
Vanadium	ug/L	6		-															12	2.0						

GSI Statistical Evaluation												
Constituent	Units	GSI	MV	<i>I</i> -55								
Constituent	Offics	GGI	UCL	LCL								
Arsenic	ug/L	100	190	90								
Molybdenum	ug/L	120	210	120								

#### 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 ( $\alpha$  = 0.01) of the downgradient data set.

LCL - Lower Confidence Limit ( $\alpha$  = 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) 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 (TRC, January 2022); therefore, confidence intervals were not calculated

#### Mass Flux Calculations

# First Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Karn-Weadock Mixi	ng Zone C	ompliance									Arsen	ic	Molybde	num	
	Saginaw Ba	y Static Wate	er Elevation:	579.57	2/28/2022						100	μg/L	120	μg/L	
											total volume x concentration		total volume x co	oncentration	
Monitoring Well Segment <sup>(1)</sup>	Segment Width (ft)	Static Water Elevation (ft NAVD88)	Aquifer Base Elevation (ft NAVD88)	Segment <sup>(2)</sup>	Distance from Well to Bay (ft)	Total Area (ft²)	Hydraulic Conductivity <sup>(3)</sup> (ft/day)	Gradient (ft/ft)	Q=KIA Total Volume (ft <sup>3</sup> /day)	Total Volume (liters/day)	Concentration <sup>(4)</sup> (µg/L)	Total Loading (µg/day)	Concentration <sup>(4)</sup> (µg/L)	Total Loading (µg/day)	
Non-Adjacent Zone	( )	(	,		( /	,	. ,,	, ,	( ),	77	(10)	(10 )/	" " "	110 77	
MW-54R	510	579.79	576.3	2.50	55	1,275		0.0040	3.62E+00	1.03E+02	1	1.03E+02	7	7.18E+02	
JCW-MW-18004	820	579.85	579.9	-0.05	45	-41	1	0.0062	0.00E+00	0.00E+00	1	0.00E+00	5	0.00E+00	
MW-55	1,220	579.47	578.0	1.47	45	1,793		-0.0022	0.00E+00	0.00E+00	88	0.00E+00	89	0.00E+00	
JCW-MW-18005	1,120	581.01	578.5	1.25	120	1,400		0.0120	1.19E+01	3.38E+02	5	1.69E+03	5	1.69E+03	
Discharge Channel															
JCW-MW-18001	1,010	579.73	574.8	3.75	40	3,788	7.1E-01	0.0040	1.08E+01	3.05E+02	1	3.05E+02	5	1.52E+03	
MW-50	970	579.73	574.31	4.50	45	4,365		0.0036	1.10E+01	3.12E+02	2	6.24E+02	6	1.87E+03	
Adjacent Zone			_												
MW-51	1,850	579.61	575.3	4.31	60	7,974		0.0007	3.77E+00	1.07E+02	12	1.28E+03	5	5.34E+02	
MW-52	740	579.67	575.79	3.88	55	2,871	_	0.0018	3.71E+00	1.05E+02	1	1.05E+02	5	5.25E+02	
MW-53	730	579.79	577.84	1.95	35	1,423	<u> </u>	0.0063	6.35E+00	1.80E+02	1	1.80E+02	5	9.00E+02	
									ft <sup>3</sup> to liter is	,					
							To	tal Volume:	5.12E+01		Total (lbs/day):	9.43E-06	Total (lbs/day):	1.71E-05	
									1.45E+03 5.92E-04		Total (µg/day):	4,288	Total (µg/day):	7,761	
Notes:											Chronic Load	ing Limits	Chronic Load	ing Limits	
NM - Not Measured											3.19E-04	lb/day	3.82E-04	lb/day	
(1) Monitoring Well Zones	onitoring Well Zones based on Phase II Evaluation, Appendix K Groundwater Discharge Calculations, September 30, 2005.									1.45E-04 kg/day		1.74E-04 kg/day			
Representative wells b	ased on the L	_andfill Hydroge	ological Monitor	ing Plan, Februa	ry 2021.						1.45E-01 g/day		1.74E-01 g/day		
(2) Saturated thickness wi	ated thickness will be the thickness of the sand unit when the observed static water elevation is above the top of the sand unit, or the										1.45E+02	mg/day	1.74E+02 mg/day		
measured saturated th	ickness of the	sand unit if the	static water ele	vation is below tl	he top of the s	and unit.					144,880	μg/day	173,856 µg/day		

- (3) Hydraulic conductivity is the harmonic mean of the testing results, Phase II Evaluation, Appendix K Groundwater Discharge Calculations, September 30, 2005.
- (4) Concentration reported as equal to the laboratory reporting limit for non detect sample results.

Green cells can be modified by the user.

Calculated red and yellow loadings are compared with the unit specific chronic loading limits.

Table 6

# Synthetic Precipitation Leaching Procedure Results First Quarter 2022 Quarterly Report JC Weadock Landfill, Essexville, Michigan

			DE Kar	n Ash Silo Sar	mples - March	1, 2022
Parameter	Reporting Limit	Units	Fly Ash	Fly Ash	Fly Ash	Fly Ash
	Lillit		Grab 1	Grab 2	Grab 3	Grab 4
Antimony	1	ug/L	<1	<1	<1	<1
Arsenic	1	ug/L	1	1	1	1
Barium	5	ug/L	420	1,900	1,600	2,600
Beryllium	1	ug/L	<1	<1	<1	<1
Boron	20	ug/L	170	94	180	150
Cadmium	0.2	ug/L	<0.2	<0.2	<0.2	<0.2
Chromium	1	ug/L	99	120	87	100
Cobalt	6	ug/L	<6	<6	<6	<6
Copper	2	ug/L	3	<2	<2	<2
Iron	20	ug/L	27	29	26	33
Lead	1	ug/L	<1	<1	<1	<1
Lithium	10	ug/L	12	21	21	21
Mercury	0.2	ug/L	<0.2	<0.2	<0.2	<0.2
Molybdenum	5	ug/L	100	110	160	200
Nickel	2	ug/L	12	9	9	8
Selenium	1	ug/L	49	41	49	54
Silver	0.2	ug/L	<0.2	<0.2	<0.2	<0.2
Sodium	1,000	ug/L	24,800	25,200	38,300	44,100
Thallium	2	ug/L	<2	<2	<2	<2
Vanadium	2	ug/L	39	69	39	41
Zinc	10	ug/L	<10	<10	<10	<10
Alkalinity, Bicarbonate	10,000	ug/L	<10,000	<10,000	<10,000	<10,000
Sulfate	2,000	ug/L	420,000	253,000	309,000	291,000

#### Notes:

ug/L = micrograms per liter

Table 7

# Leachate Headwell Results First Quarter 2022 Quarterly Por

# First Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Donomoton.	Reporting Units	Unito	2022 Field Leachate	2021 Field Leachate	2020 Field Leachate		2019 Field Leachate						
Parameter		LH103R	LH104	LH103	LH104	LH103	LH104						
Indicator Parameters													
Alkalinity, Bicarbonate	10,000	μg/L	1,200,000	351,000	202,000	886,000	189,000	194,000					
Dissolved Oxygen	0.1	mg/L	1.16	0.49	1.35	1.32	0.26	0.36					
O.R.P.	1	mV	-121.6	-119.6	-137.1	-88.8	-101.8	5.1					
рН	0.05	S.U.	6.95	7.47	7.52	7.39	7.21	7.50					
Specific Conductance	1	μS/cm	2,498	1,715	805	2,000	647	1,092					
Metals													
Antimony	1	μg/L	<1	2	<1	<1	<1	5					
Arsenic	1	μg/L	87	26	394	23	501	13					
Barium	5	μg/L	589	266	334	474	246	116					
Beryllium	1	μg/L	<1	<1	<1	<1	<1	<1					
Boron	20	μg/L	8,240	11,200	5,370	13,900	4,320	9,360					
Cadmium	0.2	μg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					
Chromium	1	μg/L	1	<1	<1	<1	3	<1					
Cobalt	15	μg/L	<6	<6	<6	<6	<15	<15					
Copper	1	μg/L	2	1	<1	1	<1	3					
Iron	20	μg/L	17,800	285	5,220	414	3,480	51					
Lead	1	μg/L	<1	<1	<1	<1	<1	<1					
Lithium	10	μg/L	188	58	84	61	63	23					
Mercury	0.2	μg/L	<0.2	<0.2	<0.2	<0.2							
Mercury (low-level)	0.5	ng/L	2.25	0.58	0.86	0.69	1.40	1.04					
Molybdenum	5	μg/L	12	40	132	21	187	175					
Nickel	2	μg/L	18	8	<2	6	2	<2					
Selenium	1	μg/L	21	5	2	2	2	45					
Silver	0.2	μg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					
Sodium	1,000	μg/L	156,000	80,500	72,300	59,500	59,200	52,400					
Sulfate	1,000	μg/L	94,800	178,000	<1,000	62,900	1,050	346,000					
Thallium	2	μg/L	<2	<2	<2	<2	<2	<2					
Vanadium	2	μg/L	5	28	<2	11	<2	59					
Zinc	10	μg/L	<10	<10	<10	<10	<10	<10					

#### Notes:

 $\mu$ g/L = micrograms per liter

ng/L = nanograms per liter

mg/L = milligrams per liter

mV = Millivolts

S.U. = standard units

 $\mu$ S/cm = microSiemens per centimeter

O.R.P. = Oxidation-Reduction Potential

-- = not analyzed

# EGLE Exceedance Summary Table First Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, 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

April 2022

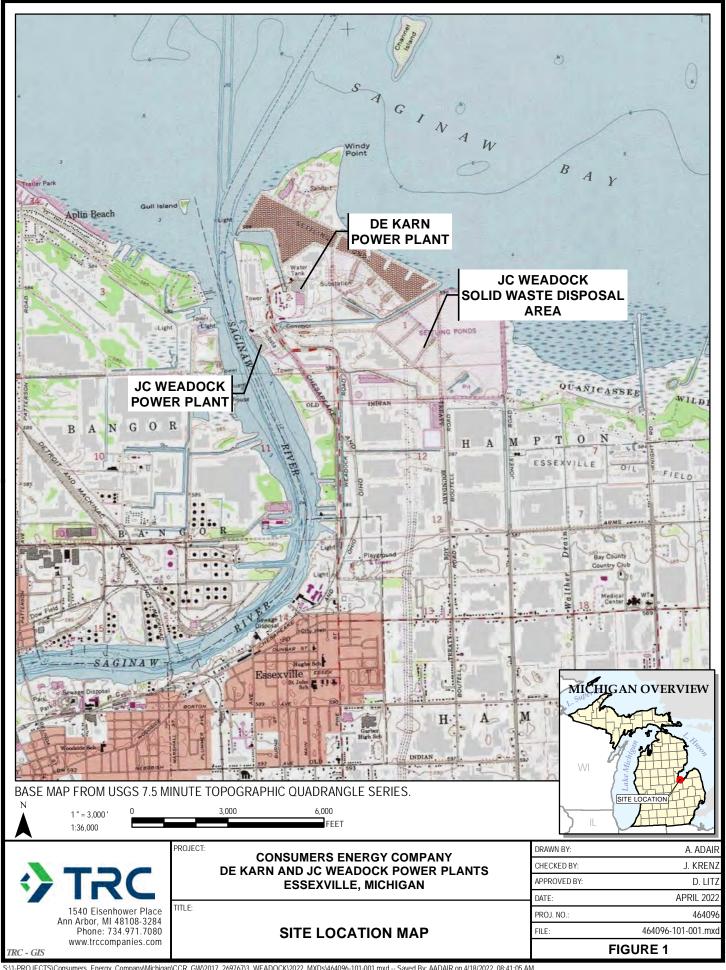
Facility: JC Weadock - WDS# 395457

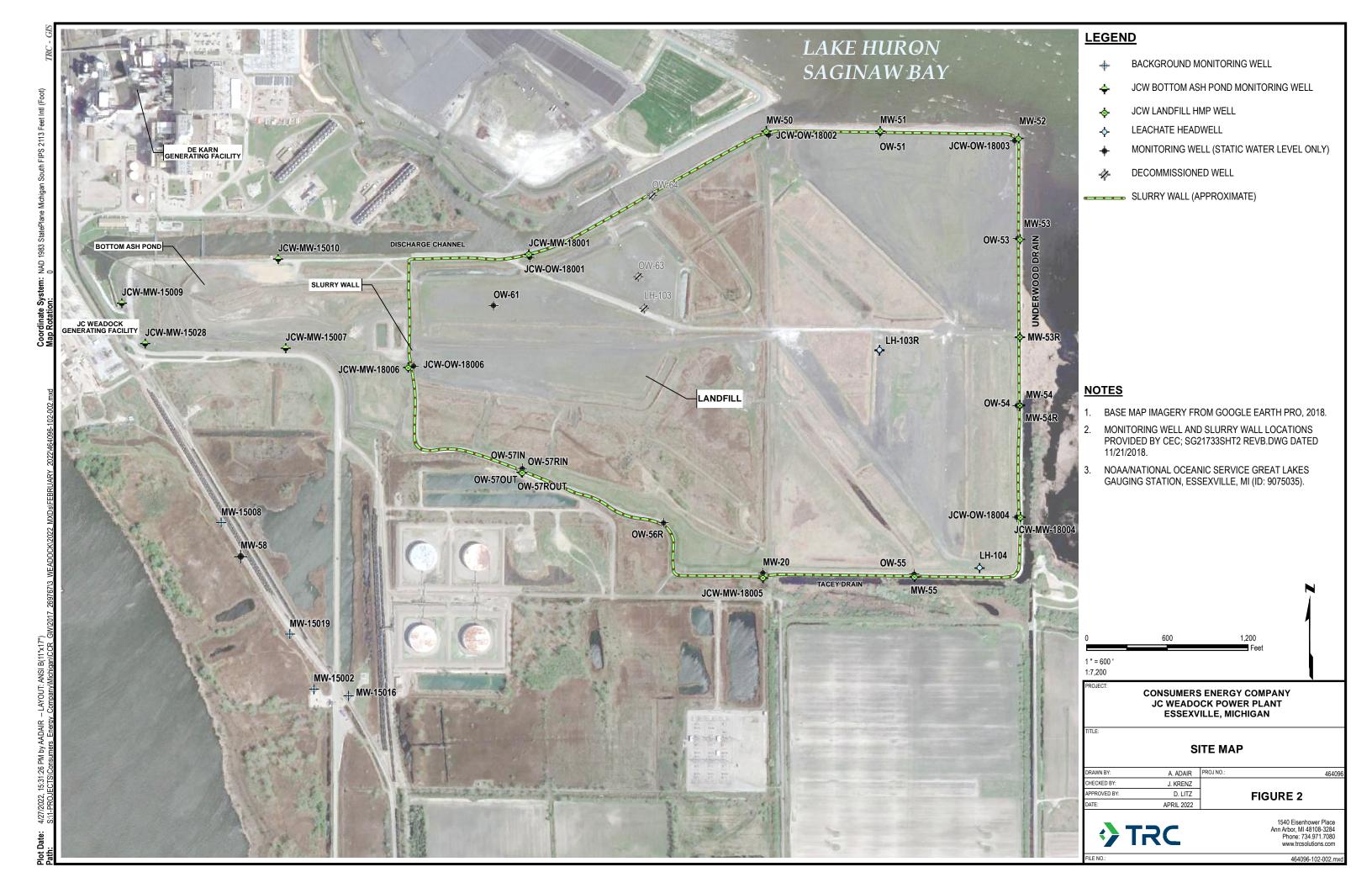
21 3 Qtr. 2021 2 Qtr. 2021 (bold >201) (bold >201)	1 Qtr. 2022 4 ( <b>bold</b> >201) (b	Statistical Limit (or 'CC' for Control Charts)	Part 201 GRCC	Parameter	Location	Well #					
No Exceedances at Compliance Locations											
	nce Location	at Complia	nces a	No Exceeda							

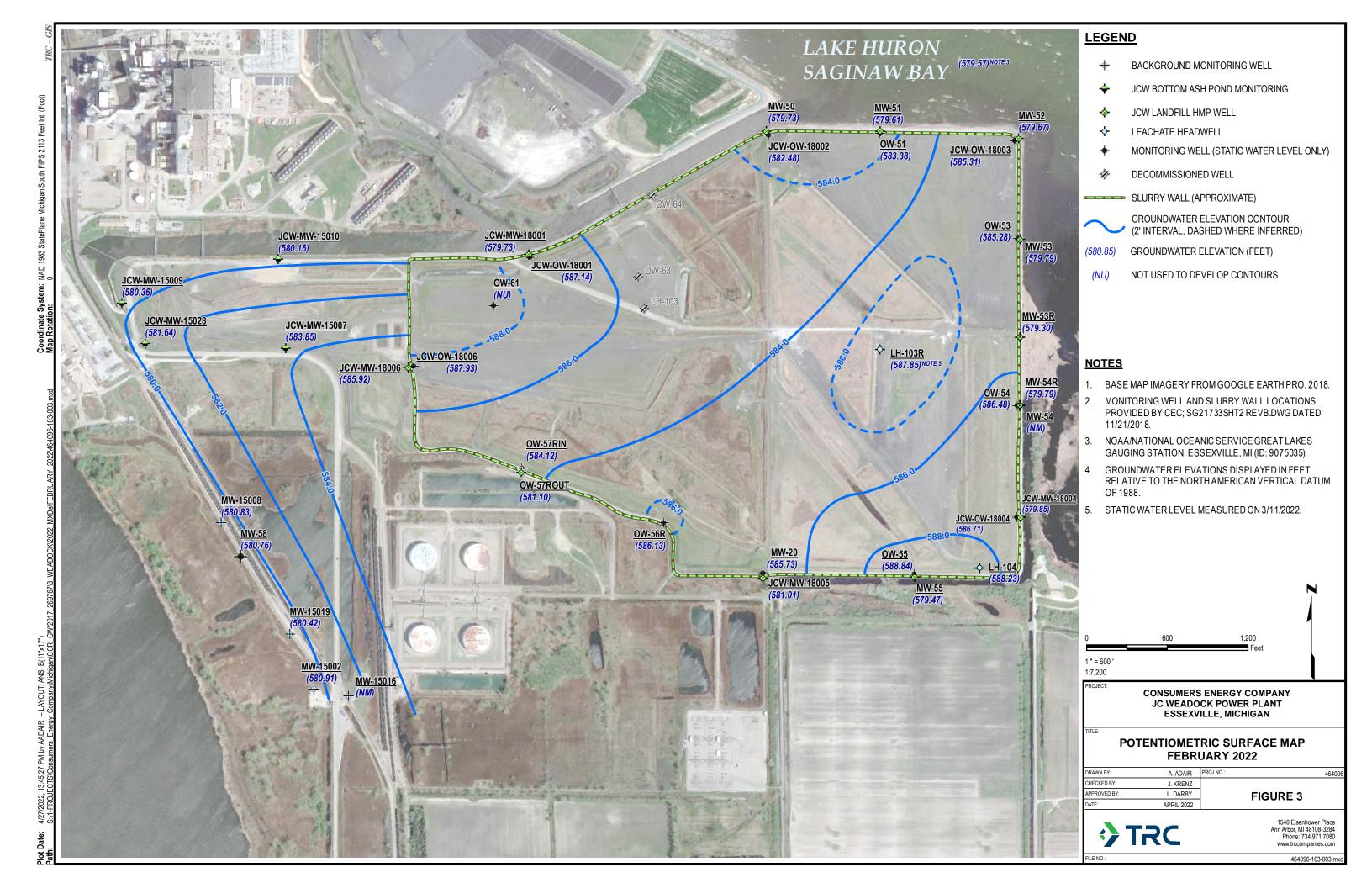
Page 1 of 1



# **Figures**









# Appendix A Static Water Level Evaluation

### Table A1

## Static Water Levels for Select Perimeter Dike Monitoring Wells and NOAA Staff Gauge First Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Well Location	Date Measured	Groundwater Water Elevation (GWE) (ft)	Saginaw Bay Surface Water Elevation (SWE) (ft)	Elevation Difference (GWE- SWE) <sup>(1)</sup>
MW-50	2/28/2022	579.73		0.17
MW-51	2/28/2022	579.61		0.05
MW-52	2/28/2022	579.67		0.11
MW-53	2/28/2022	579.79	579.56	0.23
MW-53R	2/28/2022	579.30	579.56	-0.26
MW-54R	2/28/2022	579.79		0.23
MW-55	2/28/2022	579.47		-0.09
JCW-MW-18004	2/28/2022	579.85		0.29
Averag	e:	579.65		

### 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

## First Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Monitoring Well Pair	SWL Obs Well	SWL MW	X <sub>wells</sub>	i	Saturated	Mean	Section	K	i	Area	Flow	Flow	Flow
Discharge Channel	(ft NAVD 88)	(ft NAVD 88)	(ft)	(ft/ft)	Thickness (ft)	Thickness (ft)	Length (ft)	(cm/sec)	(ft/ft)	(ft <sup>2</sup> )	ft <sup>3</sup> /day	Gal/day	Gal/yr
JCW-OW-18001	587.14	,	22.37	3.31E-01	2.00	2.88	1,010		0.33	2,904	6.27E-02	0.47	171
JCW-MW-18001		579.73			3.75			2.30E-08	0.33	2,904	0.27L-02	0.47	17.1
JCW-OW-18002	582.48		28.87	9.53E-02	4.00	4.25	970	2.30L-00	0.10	4,123	2.56E-02	0.19	70
MW-50		579.73			4.50				0.10	7,120	2.002 02	0.10	
Monitoring Well Pair	SWL Obs Well	SWL MW	X <sub>wells</sub>	i	Saturated	Mean	Section	K	i	Area	Flow	Flow	Flow
Adjacent Zone	(ft NAVD 88)	(ft NAVD 88)	(ft)	(ft/ft)	Thickness (ft)	Thickness (ft)	Length (ft)	(cm/sec)	(ft/ft)	(ft <sup>2</sup> )	ft <sup>3</sup> /day	Gal/day	Gal/yr
OW-51 MW-51	583.38	579.61	14.38	2.62E-01	4.00 4.31	4.16	1,850	,	0.26	7,687	1.31E-01	0.98	359
JCW-OW-18003 MW-52	585.31	579.67	33.85	1.67E-01	3.50 3.88	3.69	740	2.30E-08	0.17	2,731	2.97E-02	0.22	81
OW-53 MW-53	585.28	579.79	20.14	2.73E-01	1.25 1.95	1.60	730		0.27	1,168	2.08E-02	0.16	57
Monitoring Well Pair	SWL Obs Well	SWL MW	X <sub>wells</sub>	i	Saturated	Mean	Section	K	i	Area	Flow	Flow	Flow
Non-Adjacent Zone	(ft NAVD 88)	(ft NAVD 88)	(ft)	(ft/ft)	Thickness (ft)	Thickness (ft)	Length (ft)	(cm/sec)	(ft/ft)	(ft <sup>2</sup> )	ft <sup>3</sup> /day	Gal/day	Gal/yr
OW-54 MW-54R	586.48	579.79	21.23	3.15E-01	2.00 2.50	2.25	510	(1 1111)	0.32	1,148	2.36E-02	0.18	64
JCW-0W-18004	586.71	579.79	26.59	2.58E-01	8.00	3.98	820						
JCW-MW-18004		579.85			-0.05			2.30E-08	0.26	3,260	5.48E-02	0.41	150
OW-55	588.84		23.95	3.91E-01	2.00	1.74	1,220	∠.30⊑-08	0.39	2,117	5.40E-02	0.40	147
MW-55		579.47			1.47				0.39	2,117	J.40L-02	0.40	147
MW-20	585.73		40.93	1.15E-01	1.50	1.38	1,120		0.12	1,540	1.16E-02	0.09	32
JCW-MW-18005		581.01			1.25					,,,,,,			

Calculated Groundwater Discharge from JC Weadock (gal per day) 3.10

> (cubic ft per day) 0.41 (cubic ft per min) 2.9E-04

Calculated Groundwater Discharge from JC Weadock (gal per yr) 1,131

(cubic ft per yr) 151

Calculated Groundwater Discharge from JC Weadock (gal per year per linear foot of dike)

(cubic feet per year per linear foot of dike) 1.68E-02

#### Notes:

Water level data collected on February 28, 2022 are shown by yellow cells:

- 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.

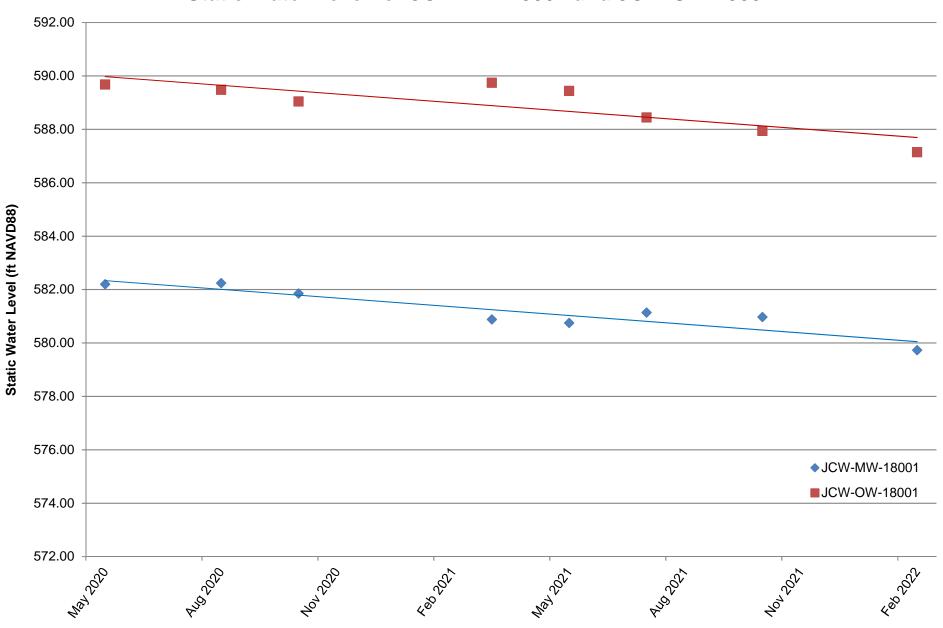
SWL = Static Water Level; Obs Well = Observation Well; MW= Monitoring Well; ft NAVD 88 = feet above North American Vertical Datum 1988

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

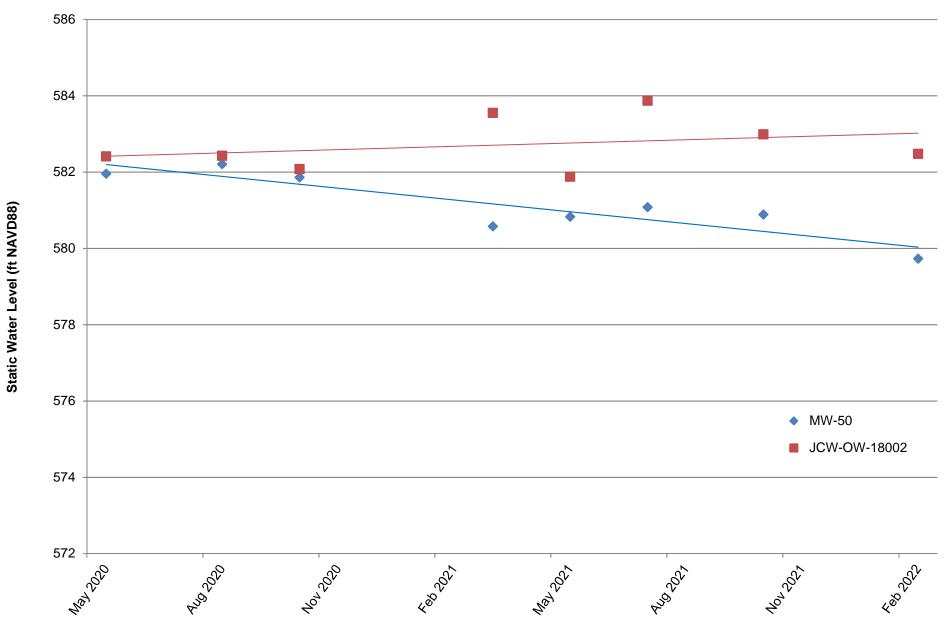
i = hydraulic gradient; K = hydraulic conductivity;  $x_{wells}$  = distance between well pairs

0.13

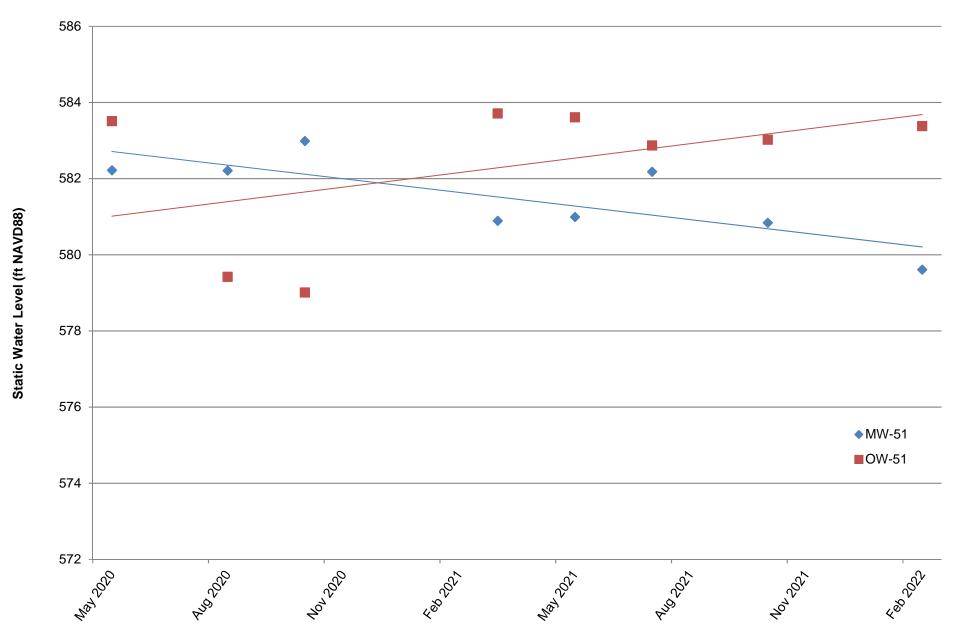
Appendix A
Static Water Level for JCW-MW-18001 and JCW-OW-18001



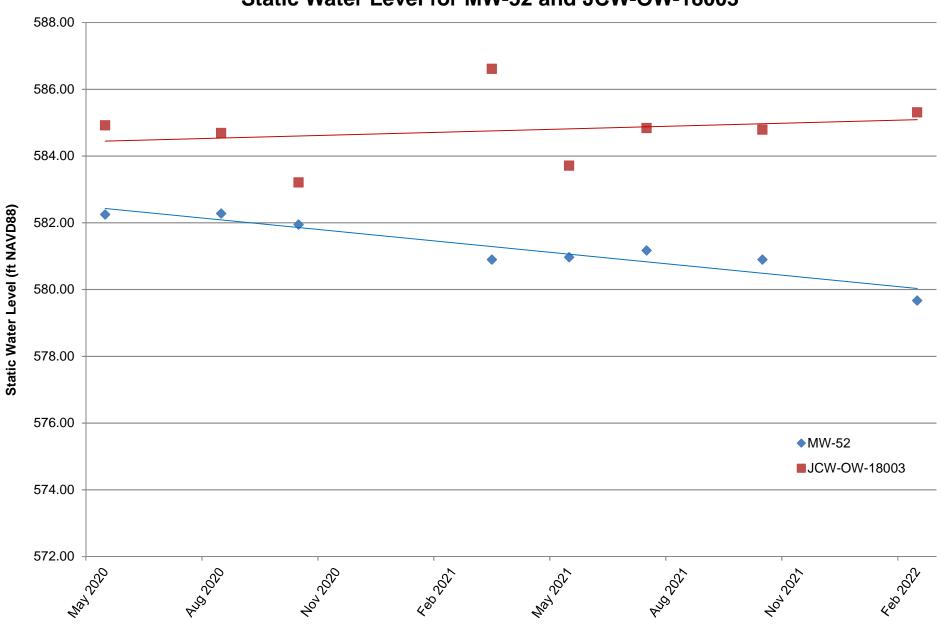
Appendix A
Static Water Level for MW-50 and JCW-OW-18002



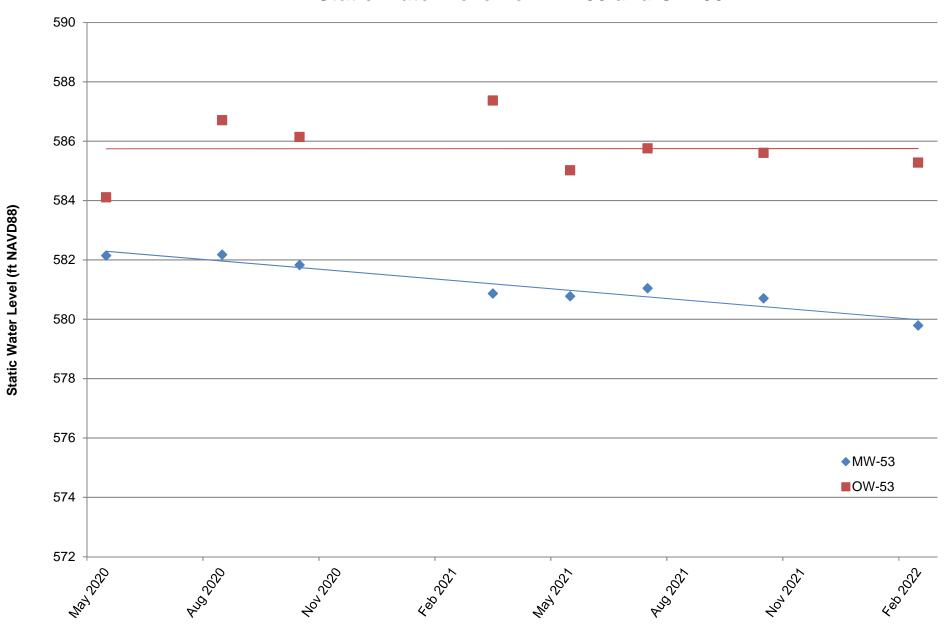
Appendix A
Static Water Level for MW-51 and OW-51



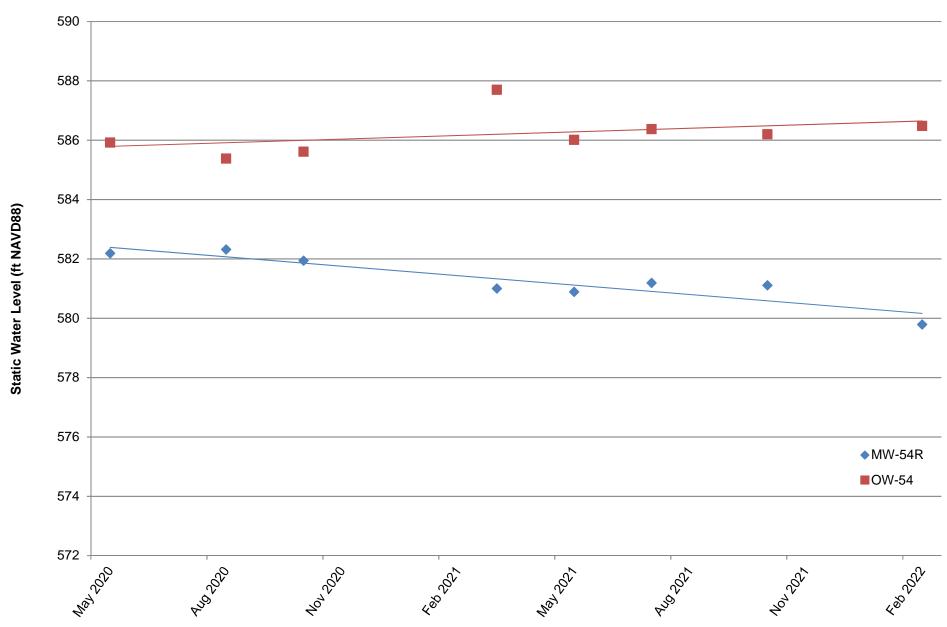
Appendix A
Static Water Level for MW-52 and JCW-OW-18003



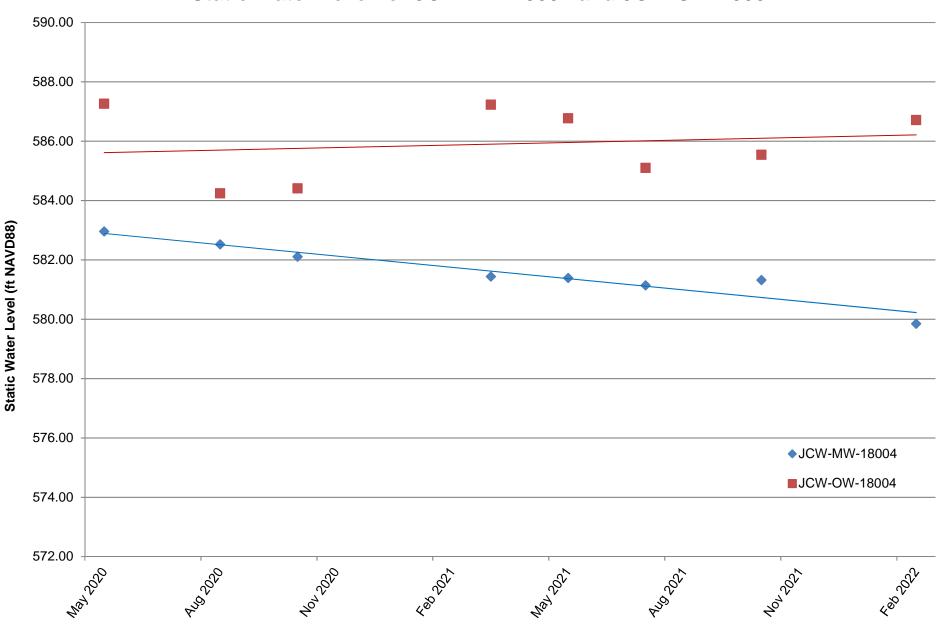
Appendix A
Static Water Level for MW-53 and OW-53



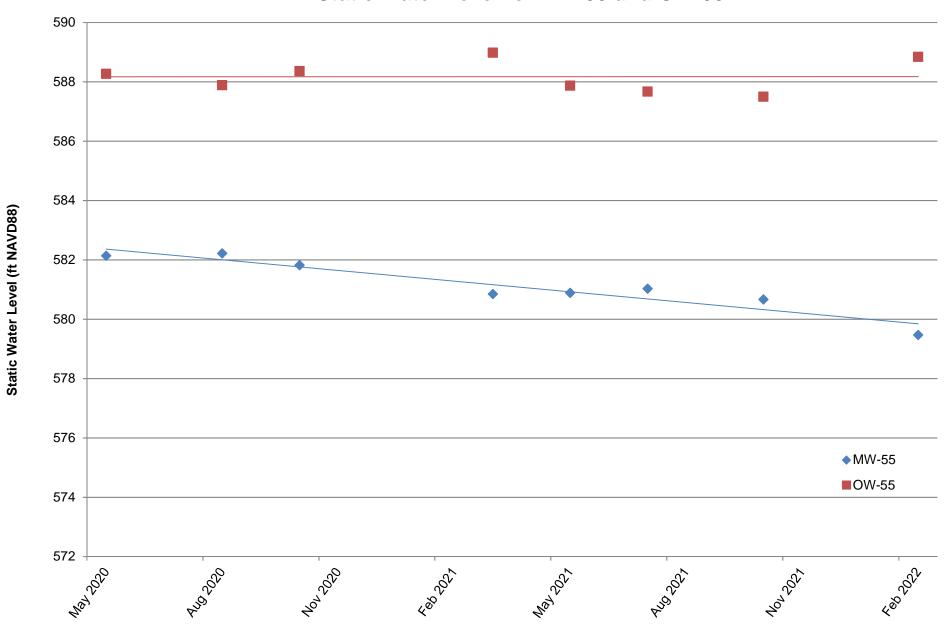
Appendix A
Static Water Level for MW-54R and OW-54



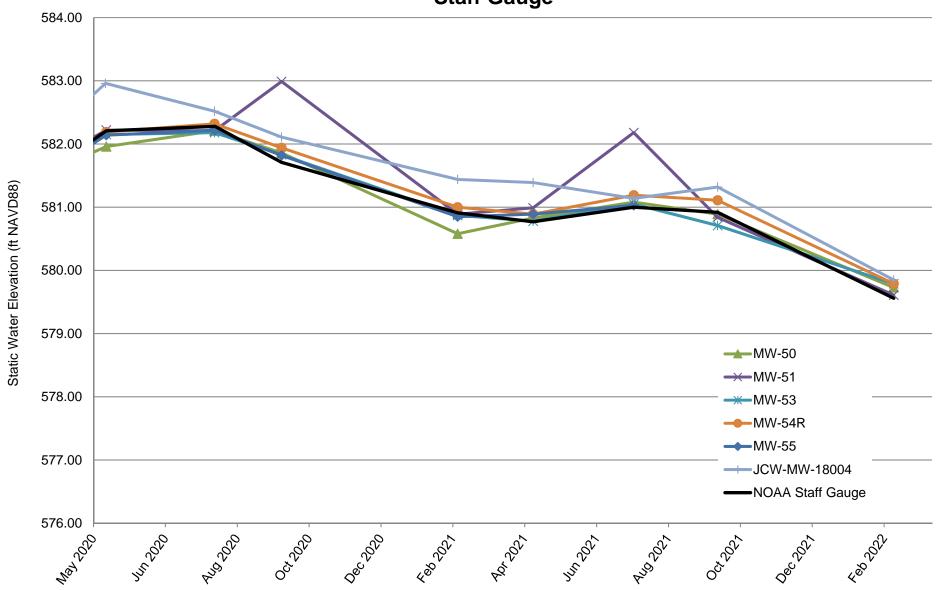
Appendix A
Static Water Level for JCW-MW-18004 and JCW-OW-18004



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



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 2022 JC Weadock Landfill

Porewater samples were collected by TRC for the March 2022 sampling event. Samples were 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) 22-0150.

During the March 2022 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 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) sample were collected. Total metals and anions were not detected in these blank samples.
- MS and MSD analyses were performed on sample JCW-MW-18001 for total metals, anions, and alkalinity. The recoveries were within the acceptance limits with one exception.
  - Molybdenum recovered above the acceptance limits (75-125%) in the MS/MSD (126%/128%) performed on this sample. Positive results for molybdenum in porewater samples are potentially biased high as summarized in the attached table, Attachment 1.
  - Relative percent differences (RPDs) 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, except molybdenum as noted above, were within the acceptance limits, there is no impact on data usability due to this issue.

- The field duplicate pair samples were DUP-JCW-LF-01/JCW-MW-18005 and DUP-JCW-LF-02/MW-50; all criteria between the parent and duplicate samples were within the QC limits with the following exception.
  - Nickel was not detected in sample MW-50 and was detected >5x the RL in the field duplicate sample, DUP-JCW-LF-02; the absolute difference was > the RL. Nickel was detected ≥5x the RL in sample JCW-MW-18005 and was detected >5x the RL in the field duplicate sample, DUP-JCW-LF-01; the RPD (85.7%) was >30. Therefore, the positive and nondetect results for nickel in all porewater samples are estimated as summarized in the attached table, Attachment 1.
- Laboratory duplicate analyses were not performed on a sample from this data set.

## Attachment 1

## Summary of Data Non-Conformances JC Weadock, Landfill Wells – RCRA CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analytes	Non-Conformance/Issue
JCW-MW-18005	3/7/2022		
MW-50	3/8/2022		
MW-55	3/7/2022		
DUP-JCW-LF-01	3/7/2022	Molybdenum	Potential high bias; high recoveries in matrix spike and matrix spike duplicate.
DUP-JCW-LF-02	3/8/2022	•	
MW-54R	3/9/2022		
OW-57R OUT	3/9/2022		
JCW-MW-18001	3/7/2022		
JCW-MW-18004	3/7/2022		
JCW-MW-18005	3/7/2022		
JCW-MW-18006	3/7/2022		
MW-50	3/8/2022		
MW-51	3/8/2022		
MW-52	3/8/2022		
MW-53	3/8/2022	Nickel	Potential uncertainty; field duplicate variability.
MW-53R	3/8/2022		
MW-54R	3/9/2022		
MW-55	3/7/2022		
MW-58	3/7/2022		
DUP-JCW-LF-01	3/7/2022		
DUP-JCW-LF-02	3/8/2022		
OW-57R OUT	3/9/2022		

## Laboratory Data Quality Review Groundwater Monitoring Event March 2022 JC Weadock Landfill

A groundwater sample was collected by TRC for the March 2022 sampling event. The sample was analyzed for total metals, low-level mercury, 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) 22-0153R.

During the March 2022 sampling event, a groundwater sample was collected from the following well:

■ LH-103R

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
Low-Level Mercury	EPA 1631E
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 (including low-level mercury), 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, as well as 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-01) and one equipment blank (EB-02) sample were collected. Low-level mercury was not detected in these blank samples.
- 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. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- The field duplicate pair samples were LH-103R DUP and LH-103R; the RPD between the parent and duplicate samples was within the QC limit.
- 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 2022 Quarterly Report Data from May 2020 to March 2022

Porewater Monitoring Points								
PARAMETER	JCW-MW-18001	JCW-MW-18004	JCW-MW-18005	JCW-MW-18006	MW-50	MW-51		
Boron	0	0	0	0	<b>^</b> *	<b>^</b> *		
Calcium	<b>^</b> *	0	↓*	0	↓*	0		
Chloride	0	0	0	0	↓*	0		
Fluoride	O*	O*	O*	O*	O*	O*		
Iron	0	0	0	0	0	0		
pH/Corrosivity	$\downarrow$	0	0	0	0	0		
Sulfate	↑ <sup>ASD</sup>	0	0	0	↓*	↓*		
Total Dissolved Solids	<b>^*</b>	<b>↓*</b>	0	0	0	<b>↓*</b>		

### 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 2021 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2021.)

## Appendix C

## Detection Monitoring Statistical Summary for JC Weadock Facility First Quarter 2022 Quarterly Report Data from May 2020 to March 2022

Porewater Monitoring Points								
PARAMETER	MW-52	MW-53	MW-53R	MW-54R	MW-55	OW-57R OUT		
Boron	0	<b>^</b> *	<b>^</b> *	1	1	<b>^</b> *		
Calcium	0	↓*	0	0	0	0		
Chloride	0	0	0	<b>^</b> *	0	0		
Fluoride	O*	O*	O*	O*	O*	O*		
Iron	0	0	0	0	0	0		
pH/Corrosivity	0	0	0	0	0	0		
Sulfate	0	<b>\_*</b>	0	<b>\_*</b>	<u> </u>	0		
Total Dissolved Solids	0	↓*	↓*	0	0	0		

### Notes:

O\* = Non-detect (70%)

O = No trend

↑ = Upward trend, continuous

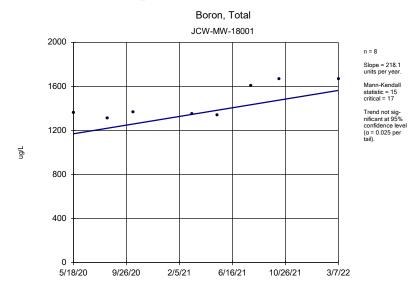
↑\* = Upward trend, new

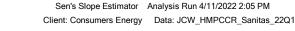
= Upward trend, confirmed

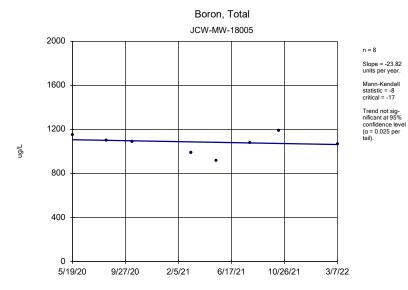
↓ = Downward trend, continuous

↓\* = Downward trend, new

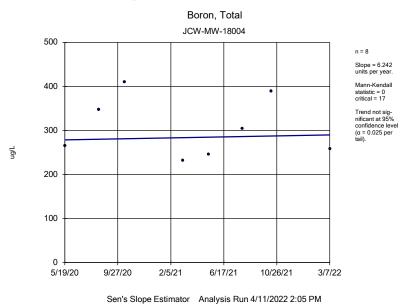
↑ ASD = Alternate Source Demonstration (Second Quarter 2021 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2021.)



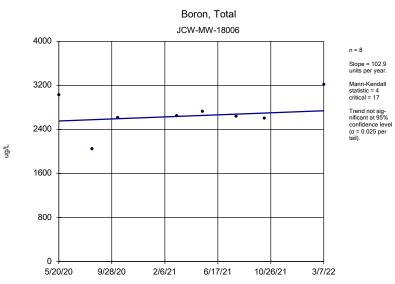




Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

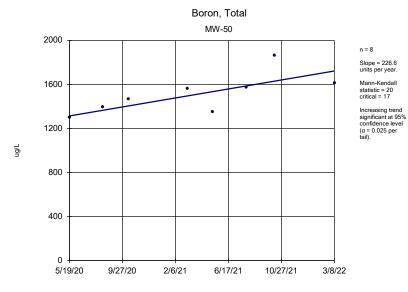


Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

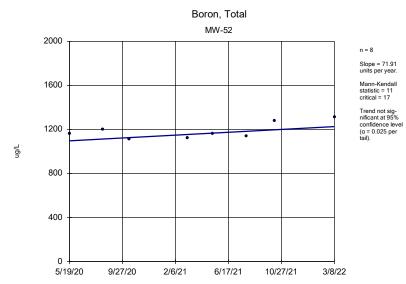


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

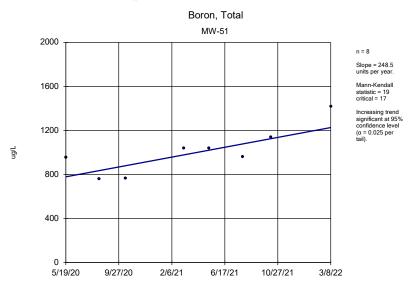


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



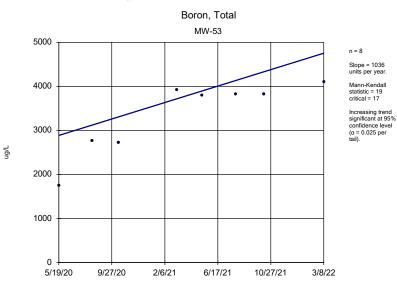
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



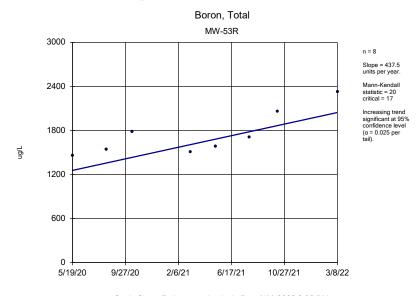
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

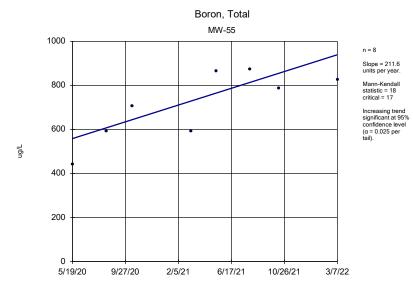


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

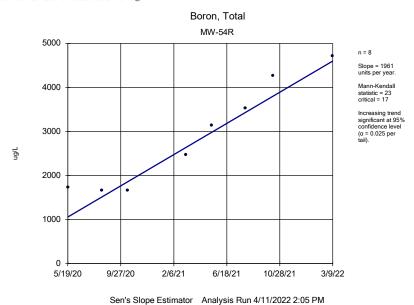


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

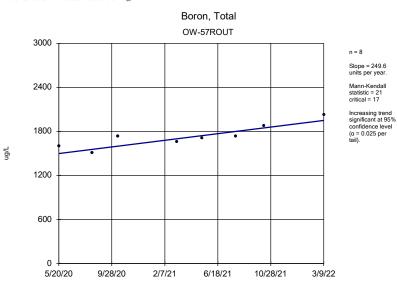


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

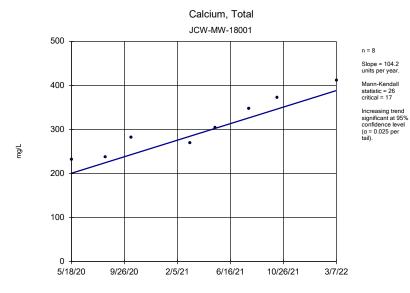


Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

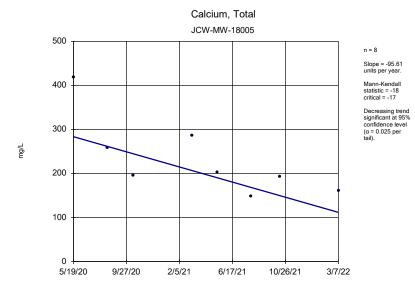


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

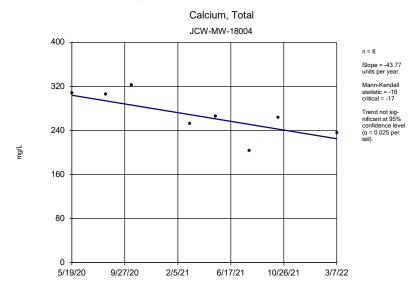
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



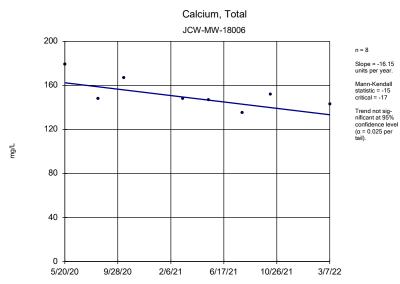
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

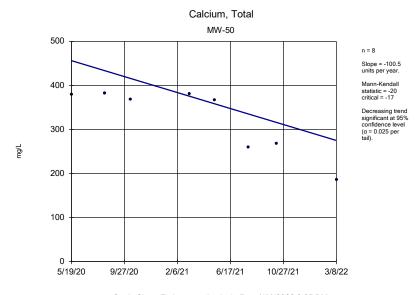


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

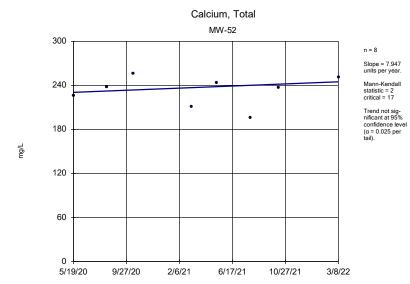


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

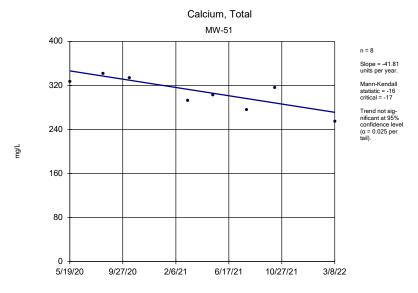


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

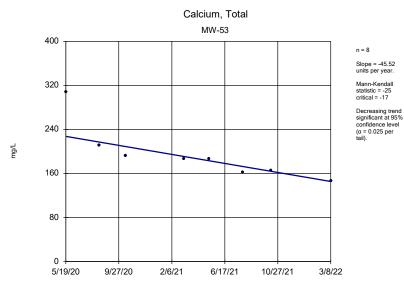


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

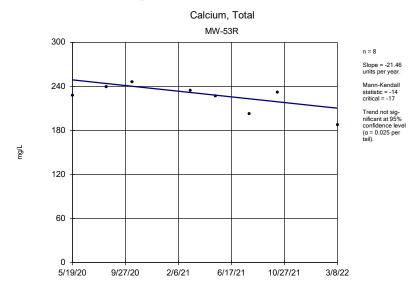


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

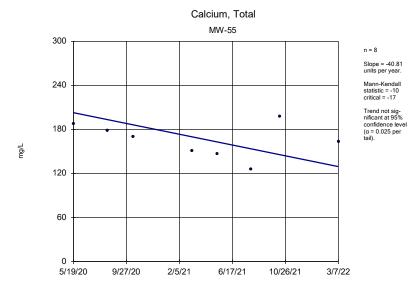


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

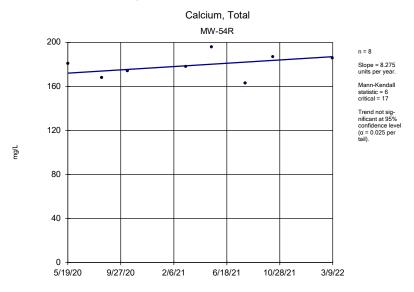


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

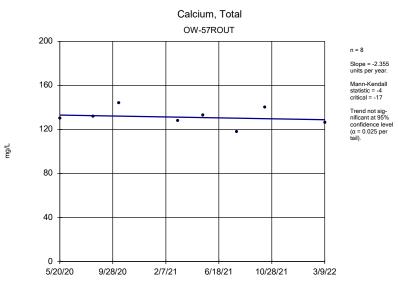


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

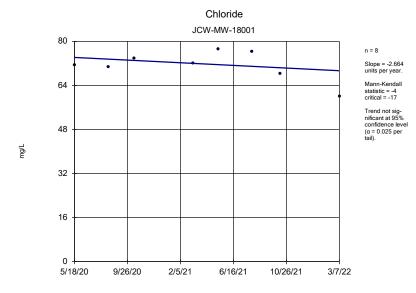


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



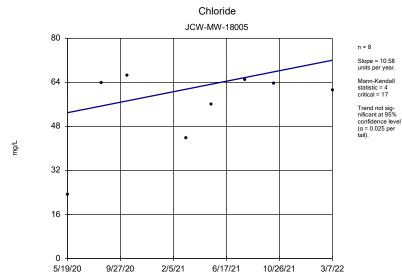
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



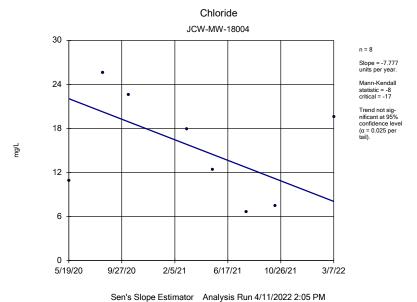
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

### $\mathsf{Sanitas^{\text{tw}}}\,\mathsf{v.9.6.32}\,\mathsf{Sanitas}\,\mathsf{software}$ licensed to Consumers Energy. $\mathsf{EPA}$

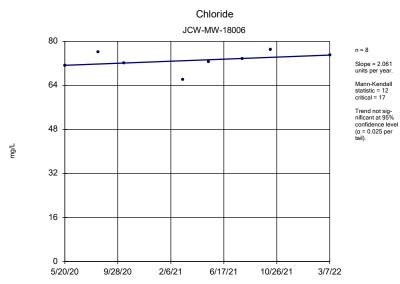


Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



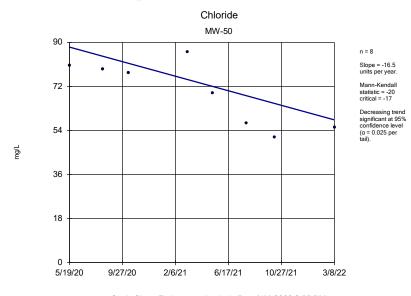
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

5/19/20

9/27/20

2/6/21



Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

## 

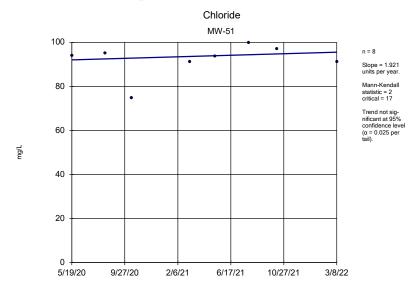
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

6/17/21

10/27/21

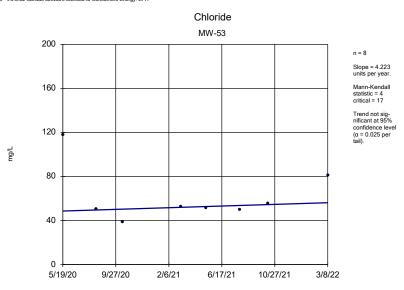
3/8/22



Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

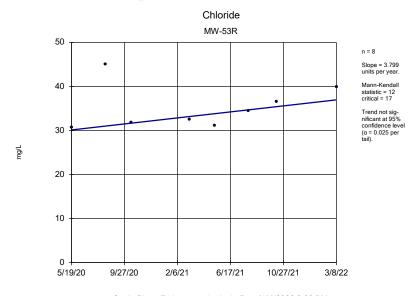
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1





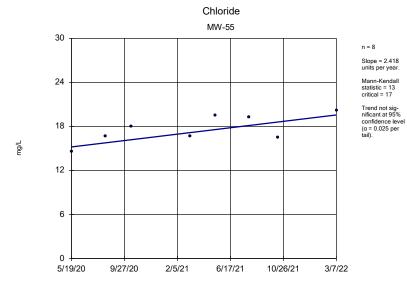
Sen's Slope Estimator Analysis Run 4/11/2022 2:05 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



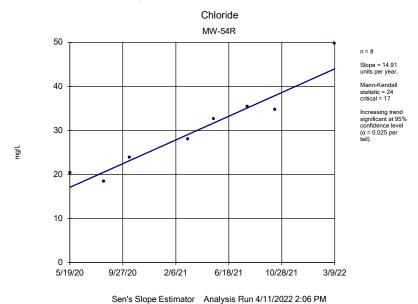
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

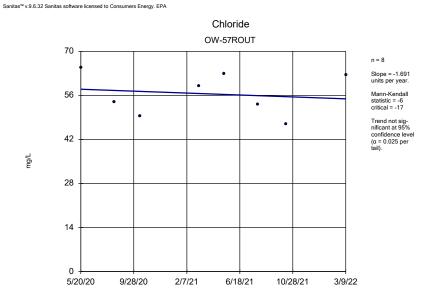
### $Sanitas^{\text{\tiny TM}} \text{ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA}$



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

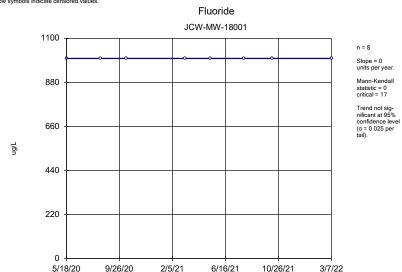




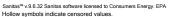
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

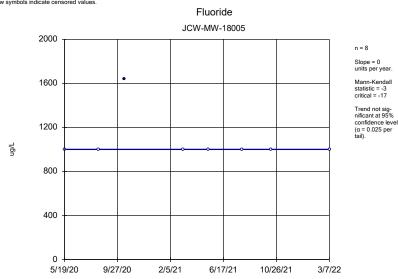
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

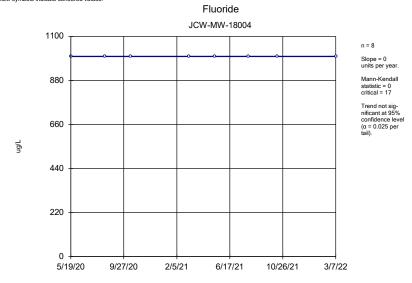




Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

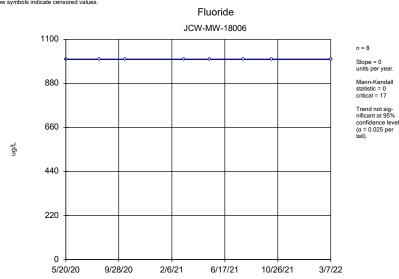
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

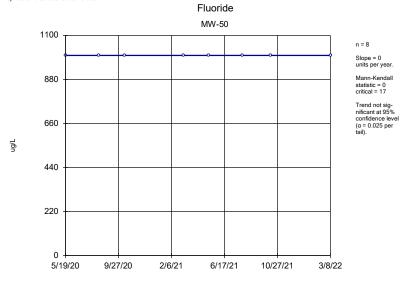
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

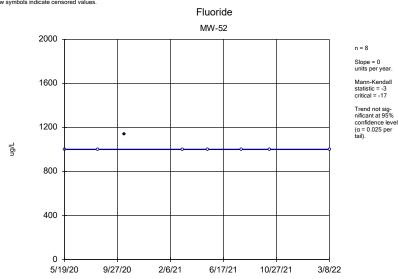
Hollow symbols indicate censored values.



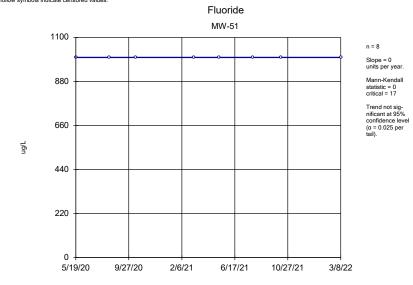
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



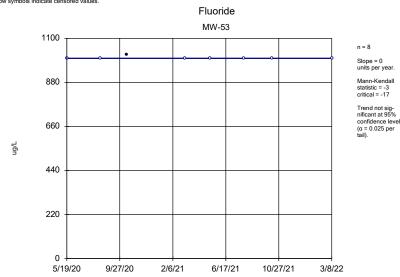
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1 Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

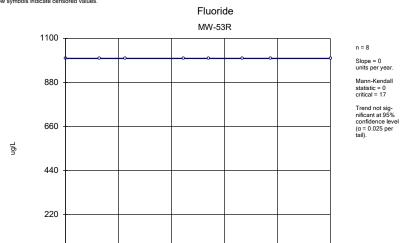
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



2/6/21

Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

6/17/21

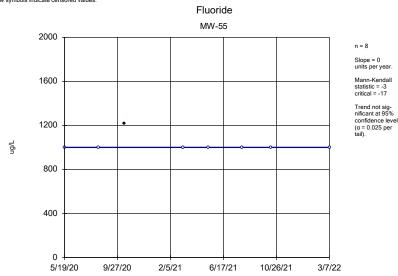
10/27/21

3/8/22

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.

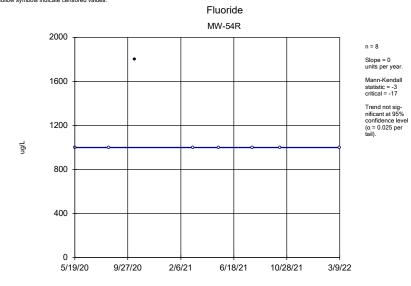
5/19/20

9/27/20



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

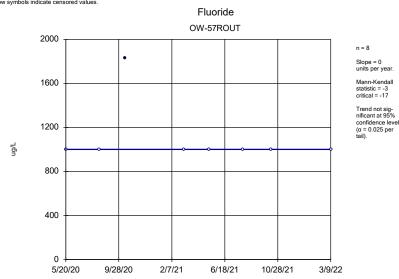
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

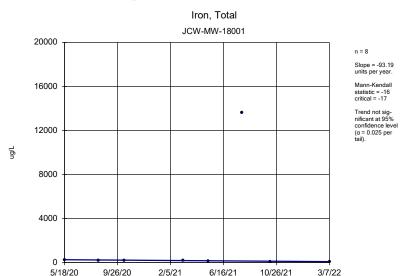
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.

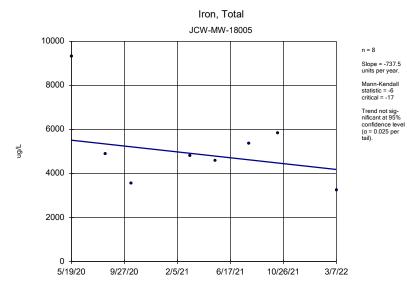


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

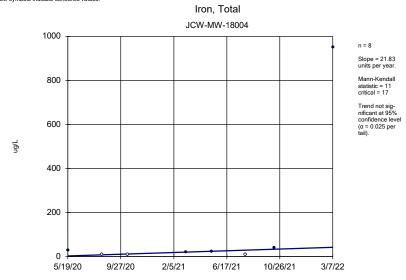


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



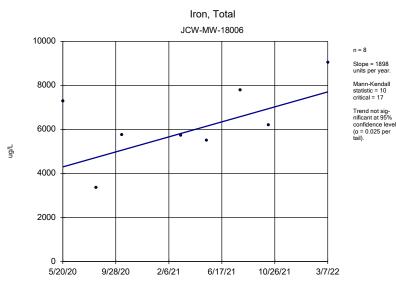
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA Hollow symbols indicate censored values.



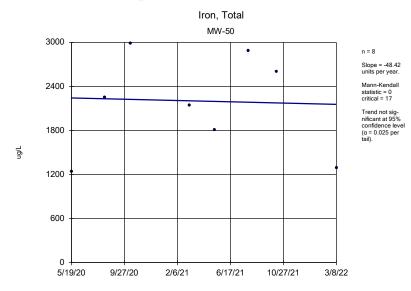
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

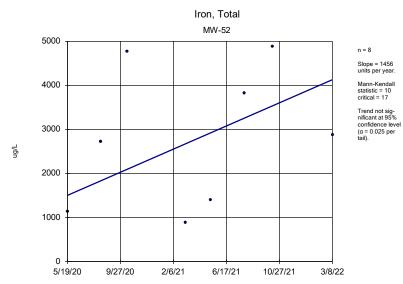


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

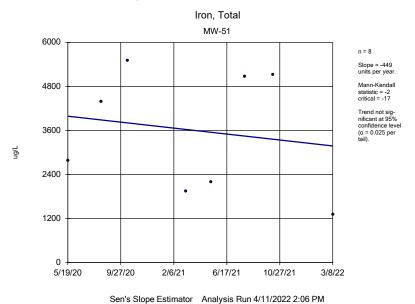
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

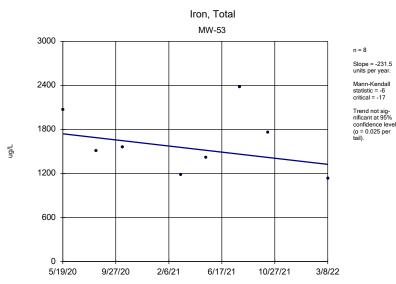


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



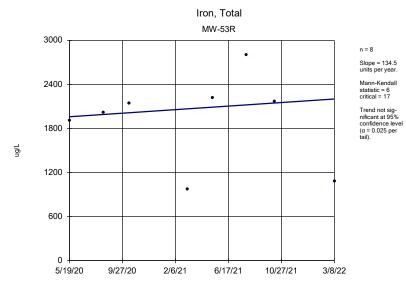
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

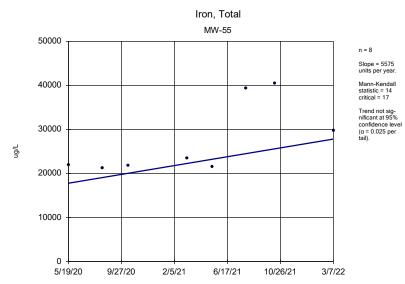


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

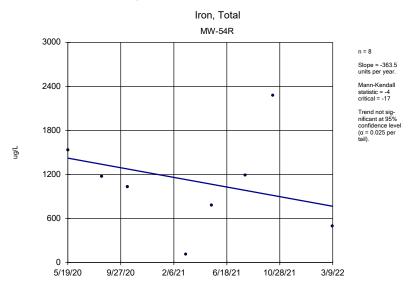


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



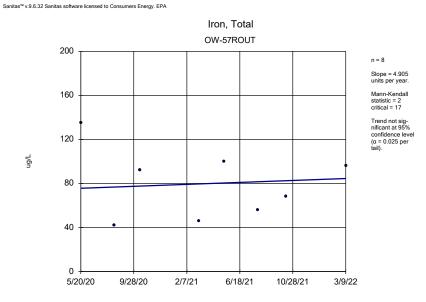
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



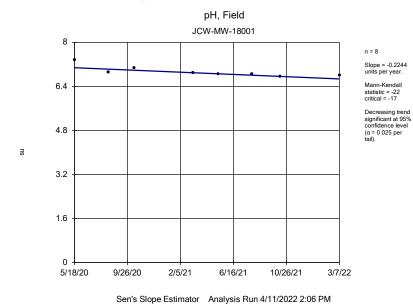
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

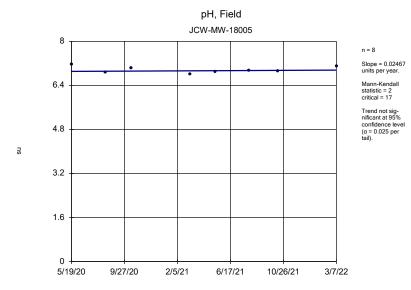


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

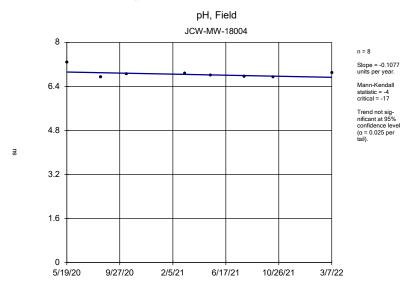


Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



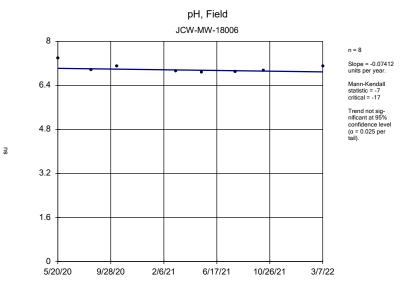
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



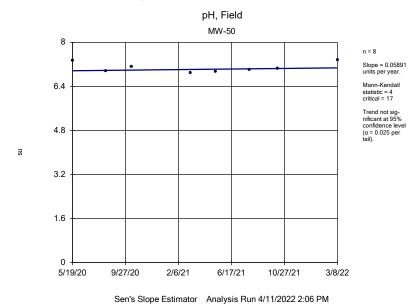
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

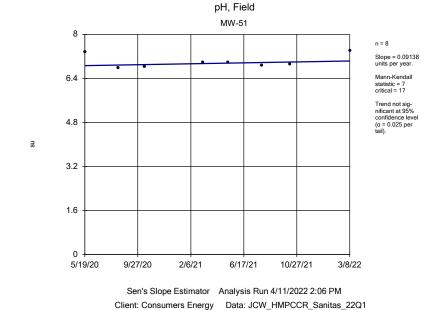


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

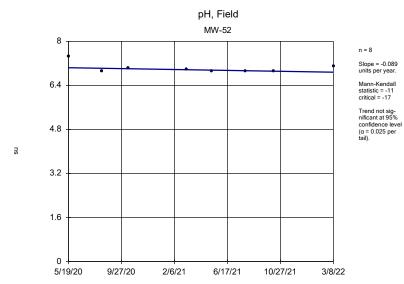
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA



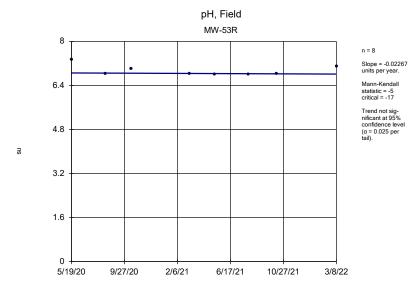
MW-53 Slope = 0.06162 units per year. Mann-Kendall 6.4 statistic = 5 critical = 17 Trend not sig-nificant at 95% confidence level 4.8  $(\alpha = 0.025 \text{ per})$ sn 3.2 1.6 5/19/20 9/27/20 2/6/21 6/17/21 10/27/21 3/8/22

pH, Field

Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

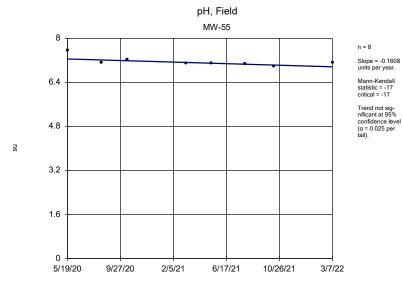
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



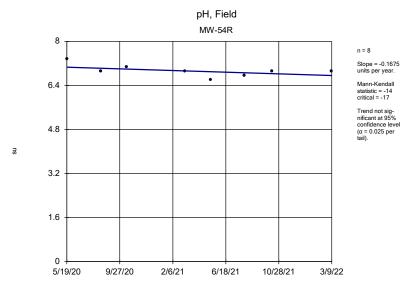
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### $\mathsf{Sanitas^{\text{\tiny{TM}}}}\,v.9.6.32\,\mathsf{Sanitas}$ software licensed to Consumers Energy. $\mathsf{EPA}$



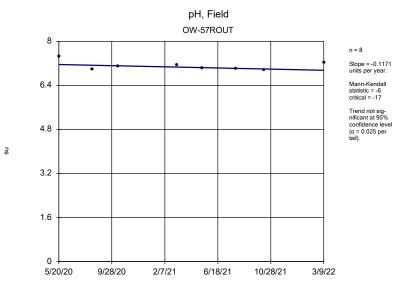
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



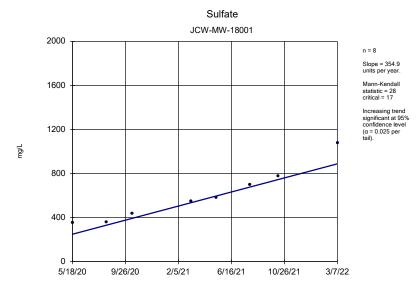
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

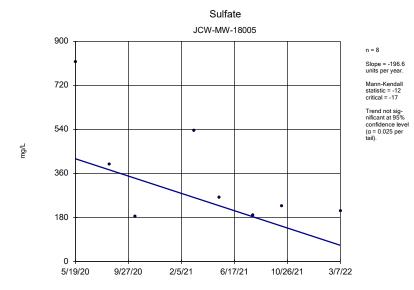


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

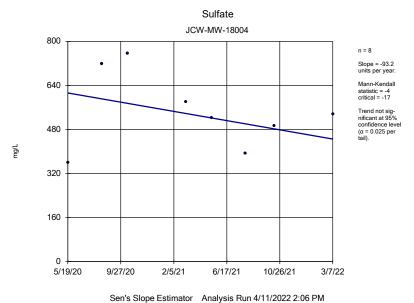
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

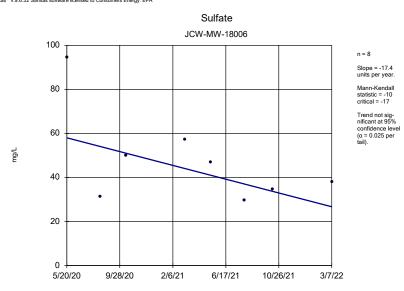


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

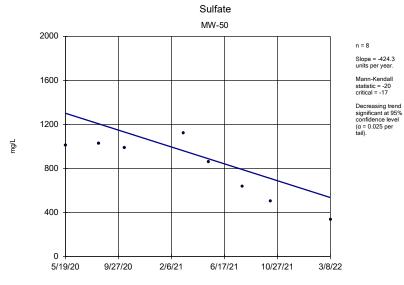


Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

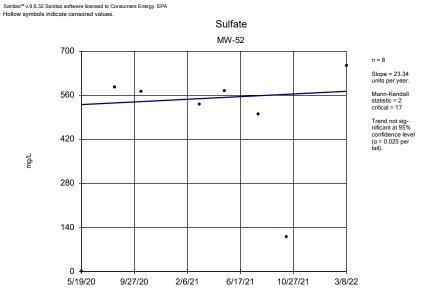
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA



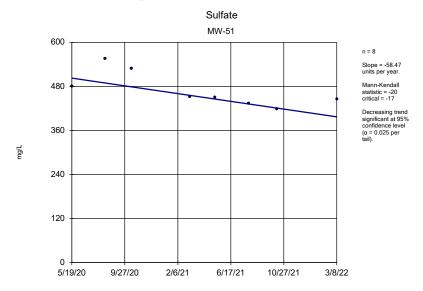
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



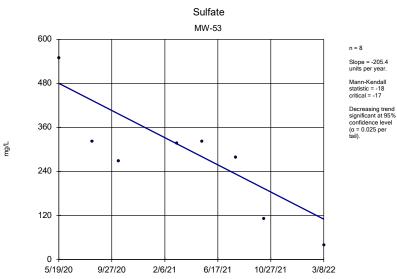
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

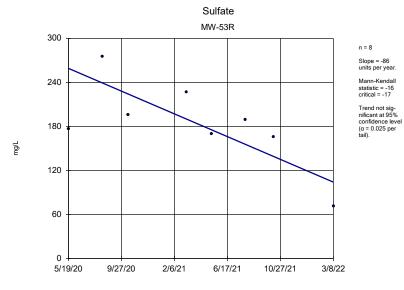
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas  $^{\text{\tiny{TM}}}$  v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

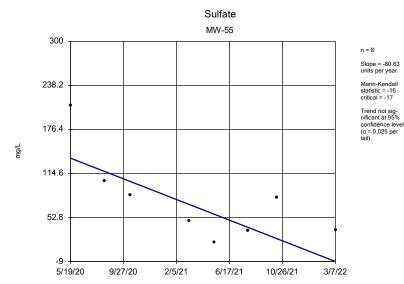


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

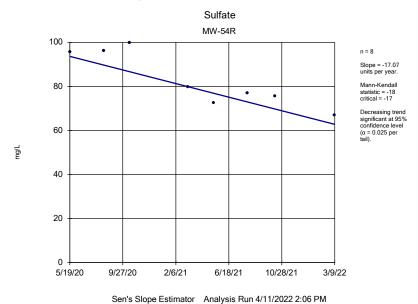
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

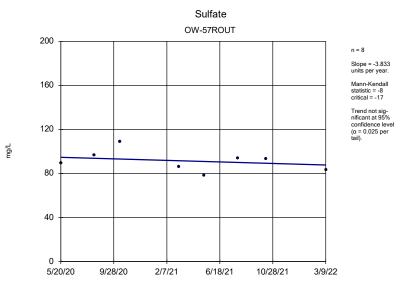


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



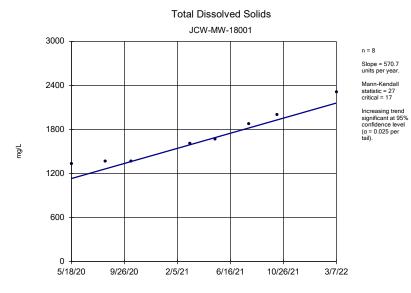
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

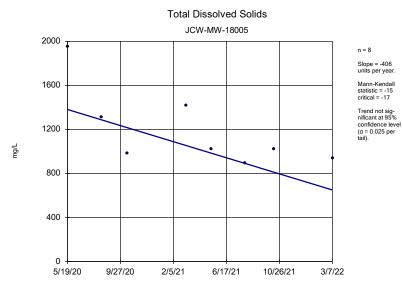


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

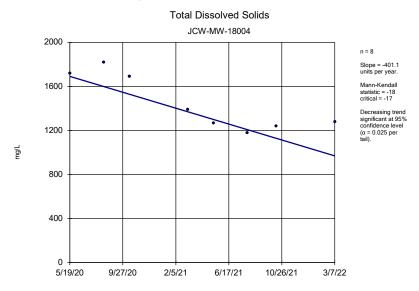
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

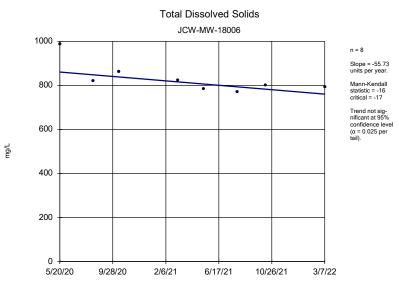


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



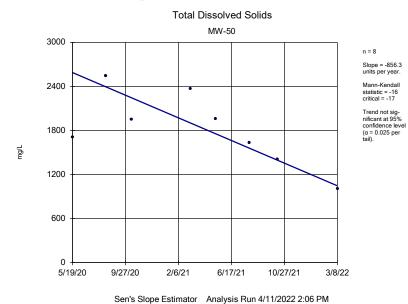
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA



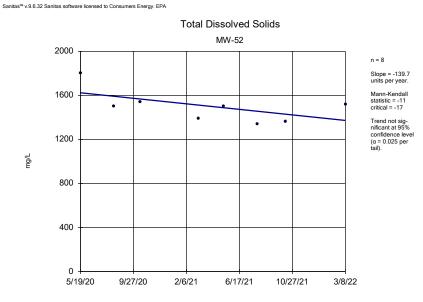
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

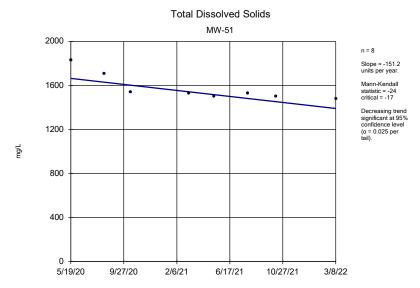


Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1





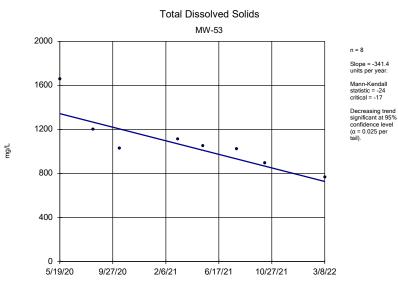
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

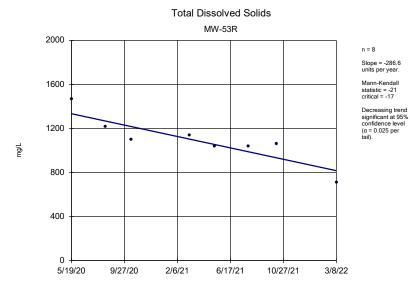
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA

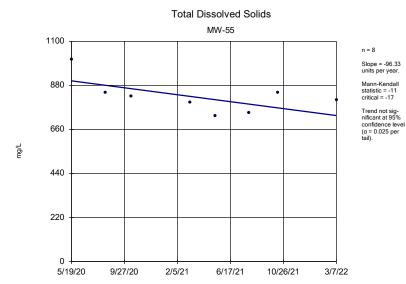


Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

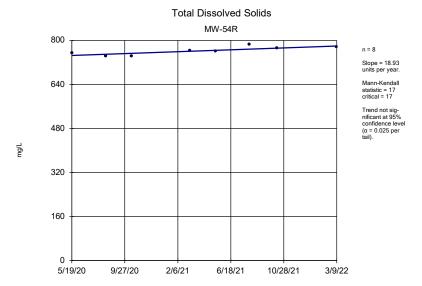
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



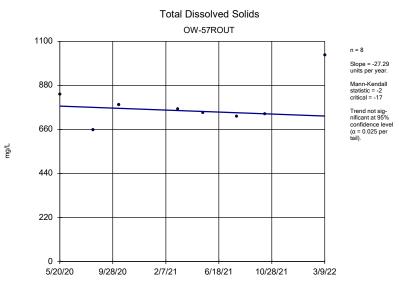
Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EPA



Sen's Slope Estimator Analysis Run 4/11/2022 2:06 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



# Appendix D Assessment Monitoring and GSI Statistical Evaluation



**Date:** April 22, 2022

**To:** J.R. Register, Consumers Energy

From: Darby Litz, TRC

Alex Eklund, TRC

**Project No.:** 464096.0000 Phase 002, Task 002

Subject: Assessment Monitoring and GSI Statistical Evaluation of the March 2022 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 Rule¹ at the JC Weadock Power Plant Landfill and quarterly groundwater monitoring in accordance with the February 2021 Landfill Hydrogeological Monitoring Plan (HMP). The first quarter 2022 monitoring event was conducted on March 7 through 10, 2022. 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 (TRC, April 2021). 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 downgradient wells. The three downgradient wells were located within a vent (e.g., opening) of the

\_

<sup>&</sup>lt;sup>1</sup> 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).

perimeter soil/bentonite slurry wall to assess the quality of groundwater passing the waste boundary. As discussed in detail below, 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 of the change in groundwater flow conditions, 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 2022 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	<b>#Downgradient Wells Exceeded</b>
Boron	560 μg/L	10 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 <sup>2</sup>, 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

\_

<sup>&</sup>lt;sup>2</sup> 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, May 2020 through March 2022) were retained for further analysis. Data collected under the previous HMP is used where available.

Groundwater data were evaluated utilizing Sanitas<sup>TM</sup> statistical software. Sanitas<sup>TM</sup> is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas<sup>TM</sup> statistical program, confidence limits were selected 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<sup>3</sup> 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<sup>TM</sup> 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 trends. No outliers were identified in the data set.

The Sanitas<sup>TM</sup> 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

<sup>&</sup>lt;sup>3</sup> Confidence level is assessed for each individual comparison (i.e. per well and per constituent).

purposes of calculating the confidence intervals.

The Sanitas<sup>™</sup> 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<sup>4</sup> 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 MW-50, MW-51, MW-53, JCW-MW-18001, JCW-MW-18004, and JCW-MW-18005;
- Sulfate in MW-50, JCW-MW-18001, and JCW-MW-18005;
- Arsenic in MW-53R, MW-55, JCW-MW-18001, and JCW-MW-18006;
- Molybdenum in MW-55;
- Iron in MW-55; and,
- Vanadium in JCW-MW-18001.

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 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-54R and OW-57ROUT, calcium at JCW-MW-18001 and MW-53, and sulfate at JCW-MW-18001 are statistically significant (Attachment 1). The trends are causing the confidence

4

<sup>&</sup>lt;sup>4</sup> The past two years of available data (six events total) were used for constituents that were not previously included in quarterly monitoring for the Weadock Landfill, i.e. calcium, chloride, fluoride, total dissolved solids, beryllium, cadmium, cobalt, mercury, radium, thallium, nickel, and zinc. Use of the most recent two years of data ensure the timeframe for analysis is consistent with other constituents and is representative of current site conditions.

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-54R and OW-57ROUT, calcium at JCW-MW-18001 and MW-53, 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<sup>™</sup> 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	Boron at JCW-MW-18005, JCW-MW-18006, MW-50, MW-51, MW-52, MW-53R, and MW-55 Calcium at JCW-MW-18004 and MW-51 Sulfate at JCW-MW-18001 and MW-50 Arsenic at JCW-MW-18006 and MW-53R
Normalized by natural log transformation	Sulfate at JCW-MW-18005
Normalized by square root transformation	Calcium at JCW-MW-18005
Normalized by power transformation	Boron at MW-53 (x^3)
Non-Parametric (not able to be normalized)	Boron at JCW-MW-18001 Calcium at MW-50 Arsenic at JCW-MW-18001 Iron at MW-55
Non-Parametric (over 50% non-detect)	Vanadium at JCW-MW-18001

The confidence interval test compares 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 below the GWPS since the second quarter 2021. Calcium concentrations at MW-51 were previously considered statistically significant; however calcium concentrations appear to be decreasing and the lower confidence limit is below the GWPS in first quarter 2022. Concentrations 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, and OW-57R OUT. The boron exceedances are the result of the addition of the Appendix III constituents to the assessment monitoring statistical evaluation program in accordance with the HMP. 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; and
- Molybdenum 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 and molybdenum 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 and molybdenum 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<sup>™</sup> 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 Molybdenum 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 and molybdenum concentrations at MW-55 were previously considered statistically significant; however, the arsenic and molybdenum concentrations decreased in first quarter 2022. The previously observed increasing trend for arsenic at MW-55 was no longer statistically significant in first quarter 2022. The lower confidence limits for arsenic and molybdenum were below the GWPS in first quarter 2022.

# **Attachments**

Table 1 Comparison of Groundwater Sampling Results to Groundwater Protection Standards –

May 2020 to March 2022

Table 2 Comparison of Groundwater Sampling Results to GSI – May 2020 to March 2022

Attachment 1 Assessment Monitoring Sanitas™ Output Files

Attachment 2 GSI Evaluation Sanitas™ Output Files

# Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:							MW	V-50						
		Sample Date:	5/19/2020	8/10/2020	8/10/2020	10/13/2020	3/8/2021	3/8/2021	5/10/2021	5/10/2021	8/2/2021	8/2/2021	10/11/2021	10/11/2021	3/8/2022	3/8/2022
Constituent	Unit	GWPS		<u> </u>										<u> </u>		
Constituent	Unit	GWPS		I	Field Don			Field Don		Field Don		Field Dup	1	Field D		Field Don
Appendix III <sup>(1)</sup>	ug/L	560	1,300	1,430	Field Dup 1,360	1,470	1,510	Field Dup 1,610	1,380	Field Dup 1,320	1,520	1,630	1,830	Field Dup 1,900	1,610	Field Dup 1,620
Boron Calcium	mg/L	280	380	382	382	368	386	375	363	370	267	252	274	261	186	1,620
Chloride	mg/L	2,300	80.5	78.5	79.9	77.5	86.5	85.6	68.9	69.9	57.0	57.2	51.0	51.7	54.9	55.6
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
Sulfate	mg/L	780	1.010	1.020	1.040	990	1.130	1.120	856	867	638	634	496	512	346	330
Total Dissolved Solids	mg/L	4,700	1,710	2,270	2,820	1,950	2,360	2,380	1,950	1,970	1,630	1,640	1,440	1,380	999	1,010
pH, Field	SU	6.5 - 8.5	7.4	7.0	2,020	7.1	6.9	2,300	6.9	1,970	7.0	1,040	7.1	1,360	7.4	
Appendix IV <sup>(1)</sup>		0.0 0.0	7	7.0		7.1	0.0		0.0		7.0				7	<del>                                     </del>
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	1	2	2	3	1	1	1	1	2	2	3	3	2	2
Barium	ug/L	2,000	163	150	153	147	116	115	108	109	91	97	102	89	115	117
Beryllium	ug/L	4.0	< 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
Chromium	ug/L	100	< 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
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
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	97	111	115	100	126	128	100	100	79	81	93	68	77	77
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
Molybdenum	ug/L	73	8	7	8	7	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6	6
Radium-226	pCi/L	NA	0.512			< 0.537			< 0.237	< 0.245	-		< 0.215	0.243		
Radium-228	pCi/L	NA	< 0.402			0.613			0.557	0.607	-		1.15	1.22		
Radium-226/228	pCi/L	5.0	0.814			1.01			0.650	0.671	-		1.21	1.46		
Selenium	ug/L	50	2	< 1	< 1	1	1	1	< 1	1	3	2	4	4	2	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters	2)															
Iron	ug/L	28,000	1,240	2,280	2,230	2,990	2,100	2,190	1,810	1,810	3,000	2,780	2,500	2,710	1,400	1,180
Copper	ug/L	1,000	3	3	7	3	4	4	< 1	2	1	< 1	1	< 1	< 1	< 1
Nickel	ug/L	100	3	< 2	2	< 2	< 2	< 2	< 2	< 2	11	12	16	11	< 2	19
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
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 30	< 30	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

#### Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

 $\ensuremath{\mathsf{SU}}$  - 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.

April 2022

# Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:					MW	<i>I</i> -51				
		Sample Date:	5/19/2020	5/19/2020	8/10/2020	10/14/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	GWPS										
Appendix III <sup>(1)</sup>				Field Dup			Field Dup					
Boron	ug/L	560	944	967	758	739	798	1,040	1,040	960	1,140	1,420
Calcium	mg/L	280	331	322	341	330	337	293	303	276	316	255
Chloride	mg/L	2,300	93.8	94.2	95.2	74.2	75.4	91.2	93.6	99.8	97.1	91.1
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
Sulfate	mg/L	780	487	474	556	522	537	452	450	434	418	446
Total Dissolved Solids	mg/L	4,700	1,970	1,690	1,710	1,550	1,530	1,530	1,500	1,530	1,500	1,480
pH, Field	SU	6.5 - 8.5	7.4		6.8	6.8		7.0	7.0	6.9	6.9	7.4
Appendix IV <sup>(1)</sup>												
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	12	12	12	17	17	11	11	14	20	12
Barium	ug/L	2,000	150	153	153	147	150	143	148	148	197	198
Beryllium	ug/L	4.0	< 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
Chromium	ug/L	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	15	< 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
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	180	55	57	57	51	55	62	57	47	64	58
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
Molybdenum	ug/L	73	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA	0.461	0.299		1.35	< 0.352	-	< 0.268		0.451	
Radium-228	pCi/L	NA	0.719	0.745		< 0.588	0.776		0.626		2.01	
Radium-226/228	pCi/L	5.0	1.18	1.04		1.43	1.11		0.851		2.46	
Selenium	ug/L	50	1	< 1	< 1	< 1	< 1	1	< 1	1	3	3
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters	(2)											
Iron	ug/L	28,000	2,830	2,750	4,390	5,400	5,600	1,940	2,200	5,080	5,130	1,310
Copper	ug/L	1,000	2	2	2	2	2	2	< 1	< 1	1	< 1
Nickel	ug/L	100	2	< 2	2	< 2	< 2	< 2	< 2	11	18	< 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
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 10	< 10	< 30	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Page 2 of 12

#### 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.

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				MV	V-52			
		Sample Date:	5/19/2020	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,160	1,200	1,110	1,120	1,160	1,140	1,280	1,310
Calcium	mg/L	280	226	238	256	211	244	196	237	251
Chloride	mg/L	2,300	15.1	72.0	73.3	51.8	53.9	56.5	59.4	51.6
Fluoride	ug/L	4,000	< 1,000	< 1,000	1,140	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	< 1	586	572	531	574	501	110	654
Total Dissolved Solids	mg/L	4,700	1,800	1,500	1,540	1,390	1,500	1,340	1,360	1,520
pH, Field	SU	6.5 - 8.5	7.5	6.9	7.0	7.0	6.9	6.9	6.9	7.1
Appendix IV <sup>(1)</sup>										
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	144	144	139	123	132	115	152	170
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	1,140	< 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	38	33	31	29	21	31	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	< 0.241		0.744		< 0.237		< 0.274	
Radium-228	pCi/L	NA	0.626		0.636		< 0.407		0.778	
Radium-226/228	pCi/L	5.0	0.740		1.38		< 0.407		1.03	
Selenium	ug/L	50	< 1	< 1	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	1,140	2,720	4,770	879	1,400	3,830	4,880	2,870
Copper	ug/L	1,000	2	2	2	2	< 1	< 1	1	1
Nickel	ug/L	100	< 2	< 2	< 2	< 2	< 2	9	14	< 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	< 30	< 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.

- (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.

# Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				BANA	V-53			
										- /- /
	1	Sample Date:	5/19/2020	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,750	2,760	2,720	3,920	3,790	3,820	3,820	4,100
Calcium	mg/L	280	308	211	192	187	187	162	166	146
Chloride	mg/L	2,300	118	50.5	38.6	52.9	51.8	49.9	55.5	81.1
Fluoride	ug/L	4,000	< 1,000	< 1,000	1,020	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	549	321	269	317	322	279	111	39.5
Total Dissolved Solids	mg/L	4,700	1,660	1,200	1,030	1,110	1,050	1,020	896	768
pH, Field	SU	6.5 - 8.5	7.3	7.0	7.2	7.1	7.1	7.1	7.1	7.4
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	2	2	2	< 1	< 1	2	2	1
Barium	ug/L	2,000	144	130	131	202	214	200	212	401
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	6	< 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	1,020	< 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	58	53	49	52	46	38	53	48
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	0.386		< 0.531		< 0.239		0.399	-
Radium-228	pCi/L	NA	< 0.385		0.503		0.455		0.979	-
Radium-226/228	pCi/L	5.0	0.725		0.823		0.684		1.38	1
Selenium	ug/L	50	2	< 1	< 1	< 1	2	3	< 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	2,070	1,510	1,560	1,180	1,420	2,380	1,760	1,130
Copper	ug/L	1,000	4	1	2	2	< 1	< 1	< 1	< 1
Nickel	ug/L	100	3	< 2	< 2	< 2	< 2	6	10	< 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	< 30	< 10	< 10	< 10	< 10	< 10	< 10

Page 4 of 12

#### 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.

- (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.

# Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:		1	1	MW	-53R	ı	1	
		Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,460	1,540	1,780	1,510	1,580	1,710	2,060	2,330
Calcium	mg/L	280	228	239	246	234	227	203	232	188
Chloride	mg/L	2,300	30.7	45.0	31.8	32.5	31.1	34.5	36.6	39.9
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	177	275	196	227	170	189	166	71.7
Total Dissolved Solids	mg/L	4,700	1,470	1,220	1,100	1,140	1,040	1,040	1,060	709
pH, Field	SU	6.5 - 8.5	7.4	6.8	7.0	6.8	6.8	6.8	6.8	7.1
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	27	31	40	19	18	23	25	10
Barium	ug/L	2,000	252	208	242	202	208	204	189	203
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	60	71	66	64	59	56	57	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	0.356				0.306		0.344	
Radium-228	pCi/L	NA	0.846				0.822		1.05	
Radium-226/228	pCi/L	5.0	1.20				1.13		1.40	
Selenium	ug/L	50	< 1	< 1	1	< 1	< 1	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	1,910	2,020	2,140	971	2,220	2,800	2,170	1,080
Copper	ug/L	1,000	1	3	1	2	1	1	< 1	2
Nickel	ug/L	100	< 2	< 2	< 2	< 2	< 2	10	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	< 30	< 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.

- (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.

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				MW	-54R			
		Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/11/2021	3/9/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,730	1,660	1,660	2,470	3,140	3,530	4,270	4,720
Calcium	mg/L	280	181	168	174	178	196	163	187	186
Chloride	mg/L	2,300	20.4	18.5	23.9	28.0	32.7	35.5	34.7	49.8
Fluoride	ug/L	4,000	< 1,000	< 1,000	1,800	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	95.7	96.2	100	79.9	72.7	77.0	75.7	67.1
Total Dissolved Solids	mg/L	4,700	755	743	743	763	762	786	772	776
pH, Field	SU	6.5 - 8.5	7.4	6.9	7.1	6.9	6.6	6.8	6.9	6.9
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	2	3	3	1	1	2	4	1
Barium	ug/L	2,000	95	104	103	118	122	124	129	154
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	1,800	< 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	58	61	57	66	64	60	59	74
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	7	7
Radium-226	pCi/L	NA	< 0.192		< 0.334		< 0.255		< 0.231	
Radium-228	pCi/L	NA	0.499		< 0.504		0.782		0.759	
Radium-226/228	pCi/L	5.0	0.546		0.546		0.900		0.965	
Selenium	ug/L	50	< 1	< 1	< 1	< 1	< 1	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	1,530	1,170	1,030	115	782	1,190	2,280	496
Copper	ug/L	1,000	1	< 1	1	1	2	1	< 1	1
Nickel	ug/L	100	4	6	4	< 2	3	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	< 30	< 10	< 10	< 10	< 10	< 10	< 10

Page 6 of 12

#### 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.

- (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.

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				MV	V-55			
		Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	441	592	705	593	866	873	788	826
Calcium	mg/L	280	188	178	170	151	147	126	198	163
Chloride	mg/L	2,300	14.6	16.7	18.0	16.7	19.5	19.3	16.5	20.2
Fluoride	ug/L	4,000	< 1,000	< 1,000	1,220	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	210	104	84.0	48.0	18.5	34.3	80.7	35.4
Total Dissolved Solids	mg/L	4,700	1,010	844	826	794	729	743	844	808
pH, Field	SU	6.5 - 8.5	7.6	7.1	7.2	7.1	7.1	7.1	7.0	7.1
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	85	107	123	152	169	204	198	88
Barium	ug/L	2,000	223	250	223	366	323	347	330	299
Beryllium	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5.0	0.4	< 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	1,220	< 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	27	33	33	28	24	25	34	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	214	207	179	166	131	157	206	89
Radium-226	pCi/L	NA	0.448		< 0.447		0.525		0.467	
Radium-228	pCi/L	NA	< 0.460		0.566		0.896		1.10	
Radium-226/228	pCi/L	5.0	0.858		0.798		1.42		1.56	
Selenium	ug/L	50	< 1	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	22,000	21,300	21,800	23,500	21,500	39,400	40,500	29,800
Copper	ug/L	1,000	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Nickel	ug/L	100	< 2	< 2	< 2	< 2	< 2	6	8	4
Silver	ug/L	34	< 0.3	< 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	< 30	< 10	< 10	< 10	< 10	< 10	< 10

Page 7 of 12

#### 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.

April 2022

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				OW-57	7R OUT			
		Sample Date:	5/20/2020	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/9/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,600	1,510	1,730	1,660	1,710	1,730	1,880	2,030
Calcium	mg/L	280	130	132	144	128	133	118	140	126
Chloride	mg/L	2,300	64.9	53.9	49.4	59.0	62.9	53.1	46.9	62.5
Fluoride	ug/L	4,000	< 1,000	< 1,000	1,830	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	89.4	96.8	109	86.0	78.3	93.9	93.1	83.1
Total Dissolved Solids	mg/L	4,700	834	658	782	761	743	725	737	1,030
pH, Field	SU	6.5 - 8.5	7.5	7.0	7.1	7.2	7.0	7.0	7.0	7.2
Appendix IV <sup>(1)</sup>										
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	72	77	73	70	73	72	75	85
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	1,830	< 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	24	27	24	26	24	20	21	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	7	8	7	6	7	9	8
Radium-226	pCi/L	NA	< 0.305		< 0.324		< 0.286		< 0.227	
Radium-228	pCi/L	NA	0.468		< 0.463		0.606		1.12	
Radium-226/228	pCi/L	5.0	0.688		0.499		0.615		1.26	
Selenium	ug/L	50	< 1	< 1	< 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	135	42	92	46	100	56	68	96
Copper	ug/L	1,000	2	2	2	2	1	2	1	2
Nickel	ug/L	100	16	16	14	15	16	21	12	17
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	< 30	16	< 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.

- (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.

# Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				JCW-M	W-18001			
		Sample Date:	5/18/2020	8/10/2020	10/13/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/7/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,360	1,310	1,370	1,350	1,340	1,610	1,670	1,670
Calcium	mg/L	280	232	237	282	270	305	348	373	412
Chloride	mg/L	2,300	71.5	70.8	73.8	72.1	77.3	76.4	68.3	60.0
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	352	357	435	549	580	700	777	1,080
Total Dissolved Solids	mg/L	4,700	1330	1,370	1,370	1,610	1,670	1,880	2,000	2,310
pH, Field	SU	6.5 - 8.5	7.4	6.9	7.1	6.9	6.9	6.9	6.8	6.8
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	3	3	3	2	2	38	1	< 1
Barium	ug/L	2,000	252	261	273	213	166	199	184	129
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	8	< 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	2	< 1	< 1
Lithium	ug/L	180	60	69	66	69	68	71	103	87
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	9	< 5	< 5
Radium-226	pCi/L	NA	0.372		< 0.423		< 0.378	1	0.337	
Radium-228	pCi/L	NA	0.385		0.616		< 0.558	-	1.05	
Radium-226/228	pCi/L	5.0	0.757		1.03		< 0.558		1.39	
Selenium	ug/L	50	< 1	< 1	< 1	< 1	< 1	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	277	202	182	183	154	13,600	91	86
Copper	ug/L	1,000	1	1	1	2	3	6	2	2
Nickel	ug/L	100	< 2	< 2	2	8	2	16	20	6
Silver	ug/L	34	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	6.0	< 2	< 2	< 2	< 2	2	12	< 2	< 2
Zinc	ug/L	2,400	< 10	< 30	< 10	< 10	< 10	12	< 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.

- (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.

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:	JCW-MW-18004									
		Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022		
Constituent	Unit	GWPS										
Appendix III <sup>(1)</sup>												
Boron	ug/L	560	265	347	410	232	246	304	389	259		
Calcium	mg/L	280	308	306	323	252	266	203	264	236		
Chloride	mg/L	2,300	10.9	25.6	22.6	17.9	12.4	6.65	7.45	19.6		
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	361	718	756	581	523	393	493	537		
Total Dissolved Solids	mg/L	4,700	1,720	1,820	1,690	1,390	1,270	1,180	1,240	1,280		
pH, Field	SU	6.5 - 8.5	7.3	6.7	6.9	6.9	6.8	6.8	6.8	6.9		
Appendix IV <sup>(1)</sup>												
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	28	36	34	20	27	36	41	32		
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	31	39	37	35	36	47	63	34		
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	< 0.256		< 0.424		< 0.271		0.182			
Radium-228	pCi/L	NA	< 0.368		1.04		< 0.425		0.796			
Radium-226/228	pCi/L	5.0	< 0.368		0.922		< 0.425		0.978			
Selenium	ug/L	50	1	< 1	< 1	7	1	4	3	2		
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2		
MI Part 115 Parameters	S <sup>(2)</sup>											
Iron	ug/L	28,000	29	< 20	< 20	21	24	< 20	39	952		
Copper	ug/L	1,000	3	2	3	3	2	1	2	1		
Nickel	ug/L	100	< 2	< 2	4	< 2	2	9	16	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	< 2	< 2		
Zinc	ug/L	2,400	< 10	< 30	< 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.

- (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.

# Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:	JCW-MW-18005										
		Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	3/7/2022		
Constituent	Unit	GWPS											
Appendix III <sup>(1)</sup>											Field Dup		
Boron	ug/L	560	1,150	1,100	1,090	987	919	1,080	1,190	1,030	1,100		
Calcium	mg/L	280	419	259	195	286	202	149	193	159	164		
Chloride	mg/L	2,300	23.2	63.9	66.5	43.7	56.0	64.9	63.6	61.7	60.7		
Fluoride	ug/L	4,000	< 1,000	< 1,000	1,640	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000		
Sulfate	mg/L	780	817	398	185	535	263	190	227	204	211		
Total Dissolved Solids	mg/L	4,700	1,950	1,310	986	1,420	1,020	895	1,020	942	934		
pH, Field	SU	6.5 - 8.5	7.2	6.9	7.0	6.8	6.9	7.0	6.9	7.1			
Appendix IV <sup>(1)</sup>													
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Arsenic	ug/L	21	12	8	8	7	9	9	9	5	5		
Barium	ug/L	2,000	141	87	98	135	93	98	124	108	110		
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	1,640	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000		
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	< 1	2	< 1	< 1	< 1		
Lithium	ug/L	180	53	45	33	39	30	28	39	32	30		
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	< 5	< 5	< 5	< 5	< 5	< 5	< 5	5	5		
Radium-226	pCi/L	NA	0.381		1.07		< 0.224		< 0.262				
Radium-228	pCi/L	NA	0.457		0.540		0.524		0.984				
Radium-226/228	pCi/L	5.0	0.838		1.61		0.728		1.16				
Selenium	ug/L	50	1	< 1	< 1	< 1	1	2	4	3	3		
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2		
MI Part 115 Parameters	(2)												
Iron	ug/L	28,000	9,310	4,900	3,550	4,800	4,590	5,350	5,840	3,300	3,170		
Copper	ug/L	1,000	3	2	1	2	1	12	1	< 1	< 1		
Nickel	ug/L	100	4	9	11	8	10	29	22	10	25		
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	< 30	< 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.

- (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.

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – March 2020 to October 2021 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:	JCW-MW-18006									
		Sample Date:	5/20/2020	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022		
Constituent	Unit	GWPS										
Appendix III <sup>(1)</sup>												
Boron	ug/L	560	3,030	2,040	2,610	2,650	2,720	2,640	2,600	3,220		
Calcium	mg/L	280	179	148	167	148	147	135	152	143		
Chloride	mg/L	2,300	71.2	76.1	72.2	66.1	72.6	73.6	77.0	75.0		
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	94.5	31.2	50.1	57.3	47.0	29.7	34.7	38.1		
Total Dissolved Solids	mg/L	4,700	988	820	861	823	784	769	802	792		
pH, Field	SU	6.5 - 8.5	7.4	7.0	7.1	6.9	6.9	6.9	7.0	7.1		
Appendix IV <sup>(1)</sup>												
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Arsenic	ug/L	21	33	12	22	30	30	25	21	33		
Barium	ug/L	2,000	500	361	489	477	472	492	351	665		
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	41	59	58	53	46	47	63		
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	0.649		0.716		0.418		0.268			
Radium-228	pCi/L	NA	0.346		0.853		< 0.483		0.872			
Radium-226/228	pCi/L	5.0	0.995		1.57		0.888		1.14			
Selenium	ug/L	50	< 1	< 1	< 1	< 1	1	2	4	2		
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2		
MI Part 115 Parameters	(2)											
Iron	ug/L	28,000	7,280	3,360	5,760	5,730	5,490	7,790	6,200	9,040		
Copper	ug/L	1,000	< 1	< 1	< 1	< 1	2	< 1	< 1	< 1		
Nickel	ug/L	100	4	2	< 2	3	3	6	10	6		
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	3	< 2	3	3	3	4	2	4		
Zinc	ug/L	2,400	< 10	< 30	< 10	< 10	< 10	< 10	< 10	< 10		

Page 12 of 12

#### 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.

- (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.

#### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:							MV	V-50						
					Sample Date:	5/19/2020	8/10/2020	8/10/2020	10/13/2020	3/8/2021	3/8/2021	5/10/2021	5/10/2021	8/2/2021	8/2/2021	10/11/2021	10/11/2021	3/8/2022	3/8/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**														
Appendix III <sup>(1)</sup>								Field Dup			Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	4,000	44,000	69,000	44,000	1,300	1,430	1,360	1,470	1,510	1,610	1,380	1,320	1,520	1,630	1,830	1,900	1,610	1,620
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	1,010	1,020	1,040	990	1,130	1,120	856	867	638	634	496	512	346	330
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.4	7.0		7.1	6.9		6.9		7.0		7.1		7.4	
Appendix IV <sup>(1)</sup>																			
Arsenic	ug/L	10	100	680	100	1	2	2	3	1	1	1	1	2	2	3	3	2	2
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	1	1
Lithium	ug/L	440	NC	NC	440	97	111	115	100	126	128	100	100	79	81	93	68	77	77
Molybdenum	ug/L	120	NC	NC	120	8	7	8	7	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6	6
Selenium	ug/L	50	55	120	55	2	< 1	< 1	1	1	1	< 1	1	3	2	4	4	2	2
MI Part 115 Paramet	ters <sup>(2)</sup>																	-	
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	1,240	2,280	2,230	2,990	2,100	2,190	1,810	1,810	3,000	2,780	2,500	2,710	1,400	1,180
Vanadium	ug/L	27	NC	NC	27	< 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) .
- <sup>H</sup> Chromium GSI criterion based on hexavalent chromium per footnote {H}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

 TRC | Consumers Energy
 X:WPAAMPJT2W64096000002022Q1IT464096.0-Appx D3
 Page 1 of 8

#### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:					MW	-51				
					Sample Date:	5/19/2020	5/19/2020	8/10/2020	10/14/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**										
Appendix III <sup>(1)</sup>							Field Dup			Field Dup					
Boron	ug/L	4,000	44,000	69,000	44,000	944	967	758	739	798	1,040	1,040	960	1,140	1,420
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	487	474	556	522	537	452	450	434	418	446
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.4		6.8	6.8		7.0	7.0	6.9	6.9	7.4
Appendix IV <sup>(1)</sup>															
Arsenic	ug/L	10	100	680	100	12	12	12	17	17	11	11	14	20	12
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	55	57	57	51	55	62	57	47	64	58
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	1	< 1	< 1	< 1	< 1	1	< 1	1	3	3
MI Part 115 Parame	ters <sup>(2)</sup>	·											-		-
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	2,830	2,750	4,390	5,400	5,600	1,940	2,200	5,080	5,130	1,310
Vanadium	ug/L	27	NC	NC	27	< 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}.

 $^{\rm EE}$  - 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) additional assessment monitoring constituents (vanadium and zinc) are reported.

 TRC | Consumers Energy

 x:\WPAAM\PJT2\W64096\000012021\T464096.0-Apipx D3

 Page 2 of 8

#### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	MW-52								
Sample Date:							8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**									
Appendix III <sup>(1)</sup>														
Appendix III <sup>(1)</sup> Boron	ug/L	4,000	44,000	69,000	44,000	1,160	1,200	1,110	1,120	1,160	1,140	1,280	1,310	
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	< 1	586	572	531	574	501	110	654	
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.5	6.9	7.0	7.0	6.9	6.9	6.9	7.1	
Appendix IV <sup>(1)</sup>														
Arsenic	ug/L	10	100	680	100	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1	
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Lithium	ug/L	440	NC	NC	440	32	38	33	31	29	21	31	27	
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Selenium	ug/L	50	55	120	55	< 1	< 1	1	1	1	1	3	2	
MI Part 115 Paramet	ers <sup>(2)</sup>	<u> </u>											_	
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	1,140	2,720	4,770	879	1,400	3,830	4,880	2,870	
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}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

TRC | Consumers Energy X:\WPAAMPJT2\464096\0000\2022Q1\T464096.0-Appx D3

Page 3 of 8 April 2022

### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MV	<i>I</i> -53			
					Sample Date:	5/19/2020	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	1,750	2,760	2,720	3,920	3,790	3,820	3,820	4,100
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	549	321	269	317	322	279	111	39.5
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.3	7.0	7.2	7.1	7.1	7.1	7.1	7.4
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	2	2	2	< 1	< 1	2	2	1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	6	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	58	53	49	52	46	38	53	48
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	2	< 1	< 1	< 1	2	3	< 1	3
MI Part 115 Paramet	ers <sup>(2)</sup>												·
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	2,070	1,510	1,560	1,180	1,420	2,380	1,760	1,130
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.
- wixing 2016 GSI Citiena from wixingan bepartment of Environmental quality (wbEQ) approval letter dated becember 2
- $^{\star\star}$  GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.
- F Criterion is the Final Acute Value (FAV) .
- $^{\rm H}$  Chromium GSI criterion based on hexavalent chromium per footnote {H}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

Page 4 of 8 April 2022

### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW	'-53R			
					Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	1,460	1,540	1,780	1,510	1,580	1,710	2,060	2,330
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	177	275	196	227	170	189	166	71.7
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.4	6.8	7.0	6.8	6.8	6.8	6.8	7.1
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	27	31	40	19	18	23	25	10
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	60	71	66	64	59	56	57	56
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	< 1	< 1	1	< 1	< 1	2	3	2
MI Part 115 Paramet	ters <sup>(2)</sup>												
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	1,910	2,020	2,140	971	2,220	2,800	2,170	1,080
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) .

 $^{\rm H}$  - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

 $^{\mbox{\scriptsize EE}}$  - 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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

Page 5 of 8 April 2022

### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW	-54R			
					Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/11/2021	3/8/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	1,730	1,660	1,660	2,470	3,140	3,530	4,270	4,720
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	95.7	96.2	100	79.9	72.7	77.0	75.7	67.1
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.4	6.9	7.1	6.9	6.6	6.8	6.9	6.9
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	2	3	3	1	1	2	4	1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	58	61	57	66	64	60	59	74
Molybdenum	ug/L	120	NC	NC	120	< 5	5	5	< 5	< 5	< 5	7	7
Selenium	ug/L	50	55	120	55	< 1	< 1	< 1	< 1	< 1	1	2	2
MI Part 115 Paramet	ers <sup>(2)</sup>												
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	1,530	1,170	1,030	115	782	1,190	2,280	496
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}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MV	V-55			
					Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	441	592	705	593	866	873	788	826
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	210	104	84.0	48.0	18.5	34.3	80.7	35.4
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.6	7.1	7.2	7.1	7.1	7.1	7.0	7.1
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	85	107	123	152	169	204	198	88
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	27	33	33	28	24	25	34	28
Molybdenum	ug/L	120	NC	NC	120	214	207	179	166	131	157	206	89
Selenium	ug/L	50	55	120	55	< 1	2	1	< 1	1	1	2	1
MI Part 115 Paramet	ers <sup>(2)</sup>												
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	22,000	21,300	21,800	23,500	21,500	39,400	40,500	29,800
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}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

Page 7 of 8 April 2022

### Comparison of Groundwater Sampling Results to GSI – March 2020 to October 2021 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				JCW-M	W-18004			
					Sample Date:	5/19/2020	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	265	347	410	232	246	304	389	259
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	361	718	756	581	523	393	493	537
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.3	6.7	6.9	6.9	6.8	6.8	6.8	6.9
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	31	39	37	35	36	47	63	34
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	1	< 1	< 1	7	1	4	3	2
MI Part 115 Paramet	ters <sup>(2)</sup>												
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	29	< 20	< 20	21	24	< 20	39	952
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}.

 $^{\mbox{\scriptsize EE}}$  - 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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

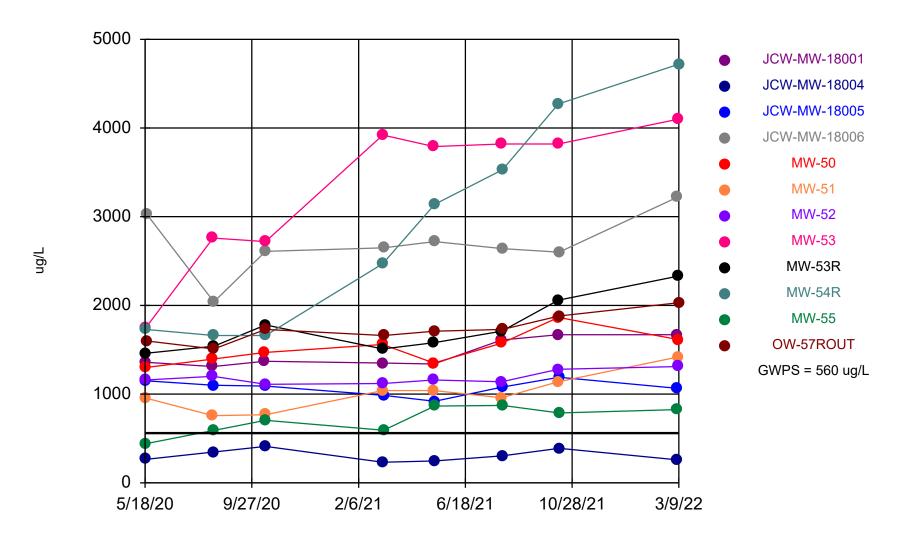
TRC | Consumers Energy X:\WPAAM\PJT2\464096\0000\2022\Q1\T464096.0-Appx D3

Page 8 of 8

April 2022

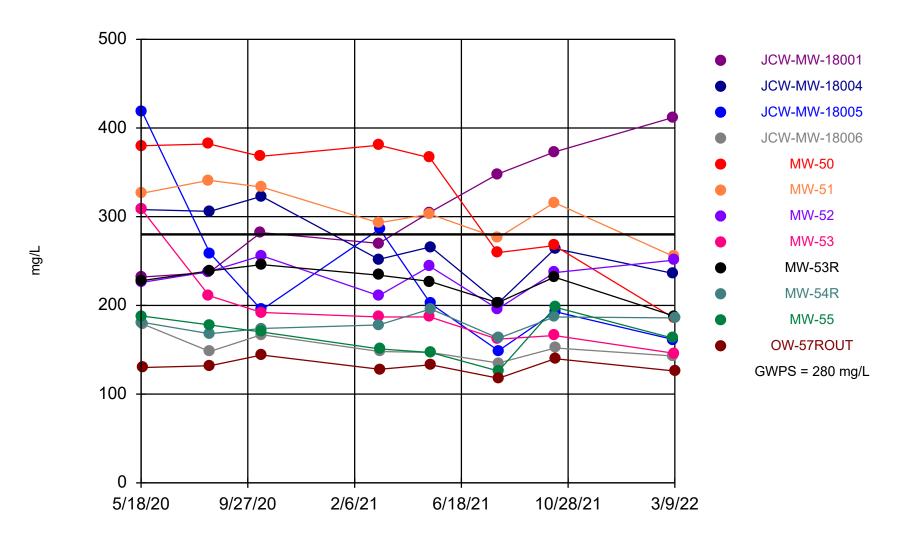
# Attachment 1 Assessment Monitoring Sanitas™ Output Files

# Boron Comparison to GWPS



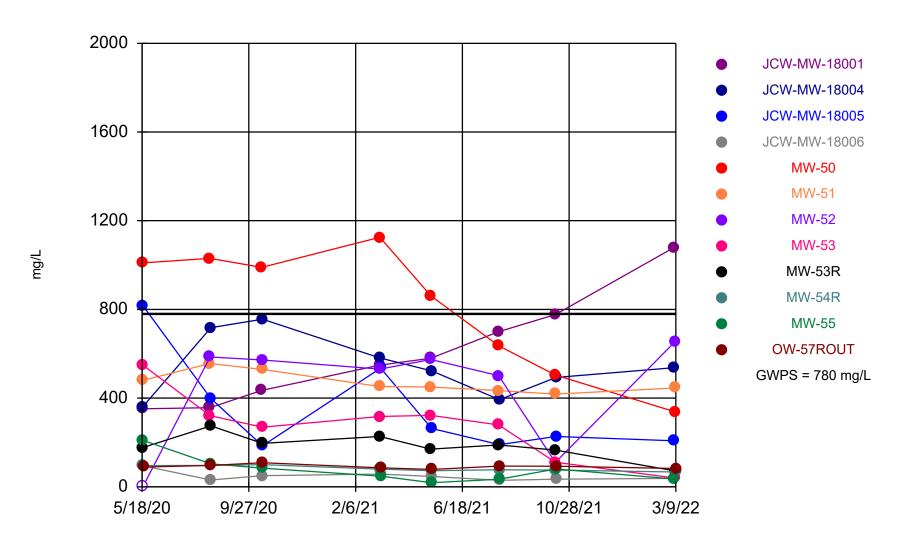
Time Series Analysis Run 4/12/2022 10:39 AM

# Calcium Comparison to GWPS



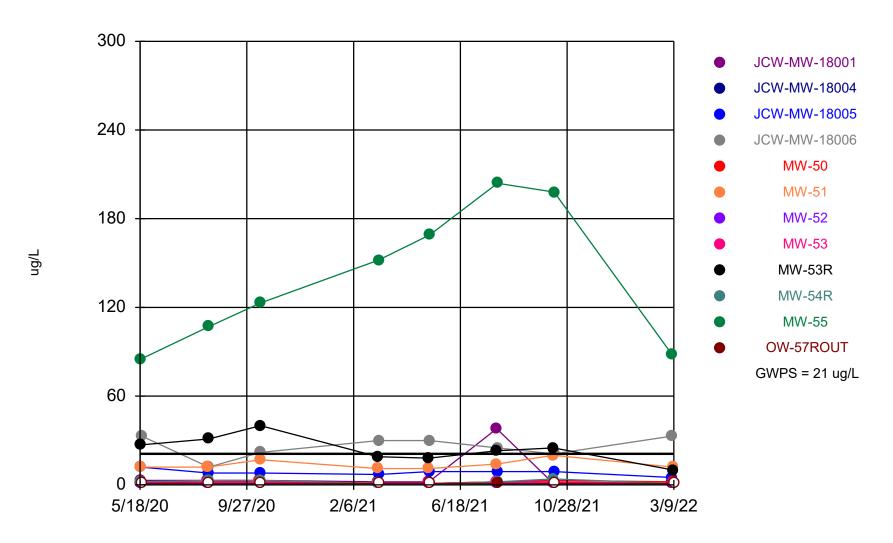
Time Series Analysis Run 4/12/2022 10:43 AM

# Sulfate Comparison to GWPS



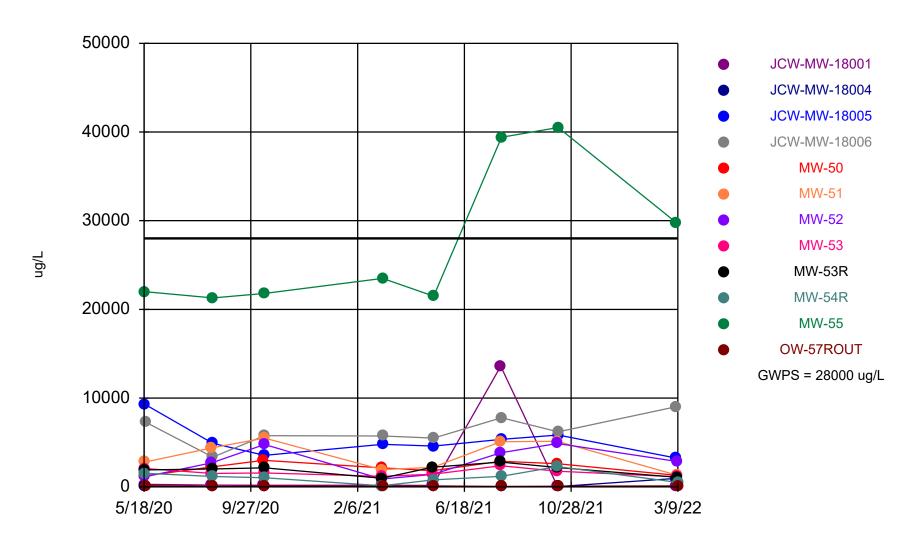
Time Series Analysis Run 4/12/2022 10:44 AM

# Arsenic Comparison to GWPS



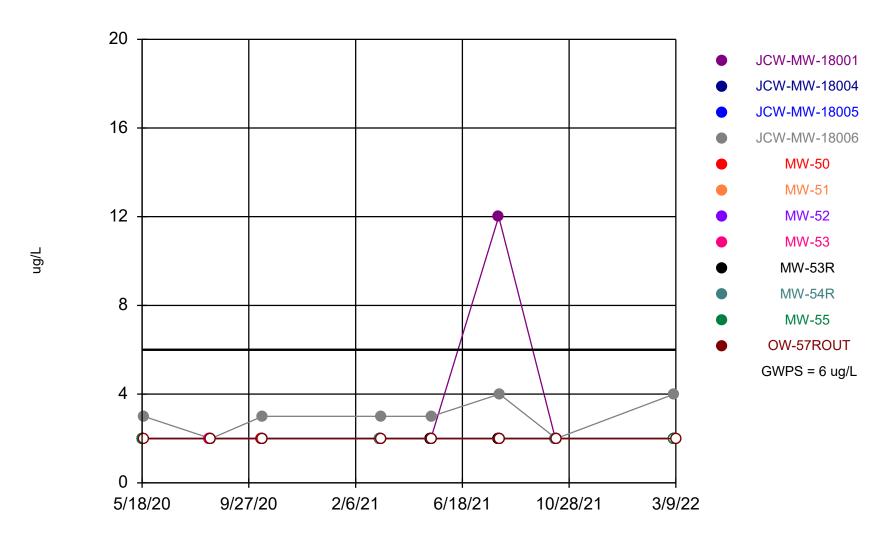
Time Series Analysis Run 4/12/2022 10:45 AM

## Iron Comparison to GWPS



Time Series Analysis Run 4/12/2022 10:45 AM

# Vanadium Comparison to GWPS



Time Series Analysis Run 4/12/2022 10:45 AM

Constituent: Arsenic, Total Analysis Run 4/12/2022 9:25 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/18/2020 and 3/9/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 25 Wells = 12 Minimum Value = 1 Maximum Value = 204 Mean Value = 18.99 Median Value = 3 Standard Deviation = 40.27 Coefficient of Variation = 2.121

Skewness = 3.231

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	1	1	38	6.625	2.5	12.7	1.918	2.248
JCW-MW-18004	8	8	1	1	1	1	0	0	NaN
JCW-MW-18005	8	0	5	12	8.375	8.5	1.996	0.2383	0.1387
JCW-MW-18006	8	0	12	33	25.75	27.5	7.246	0.2814	-0.7404
MW-50	8	0	1	3	1.875	2	0.8345	0.4451	0.2217
MW-51	8	0	11	20	13.63	12	3.249	0.2384	1.107
MW-52	8	7	1	1	1	1	0	0	NaN
MW-53	8	2	1	2	1.625	2	0.5175	0.3185	-0.5164
MW-53R	8	0	10	40	24.13	24	9.047	0.375	0.2406
MW-54R	8	0	1	4	2.125	2	1.126	0.5299	0.3911
MW-55	8	0	85	204	140.8	137.5	47.13	0.3348	0.1467
OW-57ROUT	8	7	1	1	1	1	0	0	NaN

Constituent: Boron, Total Analysis Run 4/12/2022 9:25 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/18/2020 and 3/9/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 0 Wells = 12 Minimum Value = 232 Maximum Value = 4720 Mean Value = 1638 Median Value = 1440 Standard Deviation = 980.3 Coefficient of Variation = 0.5984

Skewness =	1.1	121	
------------	-----	-----	--

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	1310	1670	1460	1365	159.4	0.1092	0.5181
JCW-MW-18004	8	0	232	410	306.5	284.5	67.99	0.2218	0.4486
JCW-MW-18005	8	0	919	1190	1073	1085	86.07	0.08025	-0.5143
JCW-MW-18006	8	0	2040	3220	2689	2645	346.1	0.1287	-0.312
MW-50	8	0	1300	1865	1516	1515	180.5	0.119	0.7035
MW-51	8	0	758	1420	1010	1000	211.8	0.2097	0.6517
MW-52	8	0	1110	1310	1185	1160	73.68	0.06218	0.7618
MW-53	8	0	1750	4100	3335	3805	830.3	0.249	-0.9162
MW-53R	8	0	1460	2330	1746	1645	304.6	0.1744	0.9713
MW-54R	8	0	1660	4720	2898	2805	1211	0.4181	0.2961
MW-55	8	0	441	873	710.5	746.5	156	0.2196	-0.5146
OW-57ROUT	8	0	1510	2030	1731	1720	161.7	0.09342	0.5954

Constituent: Calcium, Total Analysis Run 4/12/2022 9:25 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/18/2020 and 3/9/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 0 Wells = 12 Minimum Value = 118 Maximum Value = 419 Mean Value = 226.6 Median Value = 207 Standard Deviation = 75.18 Coefficient of Variation = 0.3318 Skewness = 0.6894

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	232	412	307.4	293.5	65.01	0.2115	0.3611
JCW-MW-18004	8	0	203	323	269.8	265	40.65	0.1507	-0.198
JCW-MW-18005	8	0	149	419	233.1	198.5	88.04	0.3777	1.227
JCW-MW-18006	8	0	135	179	152.4	148	14.04	0.09214	0.8614
MW-50	8	0	185.5	382	323.7	367.3	75.56	0.2334	-0.8336
MW-51	8	0	255	341	305.5	309.5	29.71	0.09725	-0.462
MW-52	8	0	196	256	232.4	237.5	20.4	0.0878	-0.6592
MW-53	8	0	146	308	194.9	187	49.99	0.2565	1.558
MW-53R	8	0	188	246	224.6	230	19.39	0.08632	-0.9474
MW-54R	8	0	163	196	179.1	179.5	10.75	0.06001	-0.009878
MW-55	8	0	126	198	165.1	166.5	23.47	0.1422	-0.2235
OW-57ROUT	8	0	118	144	131.4	131	8.088	0.06156	0.02005

Constituent: Iron, Total Analysis Run 4/12/2022 9:25 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/18/2020 and 3/9/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 3 Wells = 12 Minimum Value = 10 Maximum Value = 40500 Mean Value = 4516 Median Value = 2045 Standard Deviation = 7696 Coefficient of Variation = 1.704

Skewr	220	_	2	n	23	
okewi	iess	-	J.	U	23	١

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	86	13600	1847	182.5	4749	2.572	2.267
JCW-MW-18004	8	3	10	952	136.9	22.5	329.5	2.407	2.263
JCW-MW-18005	8	0	3235	9310	5197	4850	1872	0.3602	1.339
JCW-MW-18006	8	0	3360	9040	6331	5980	1716	0.271	-0.1028
MW-50	8	0	1240	2990	2153	2200	671.3	0.3118	-0.1844
MW-51	8	0	1310	5500	3543	3590	1663	0.4694	-0.07783
MW-52	8	0	879	4880	2811	2795	1589	0.5654	0.1042
MW-53	8	0	1130	2380	1626	1535	429.1	0.2638	0.5728
MW-53R	8	0	971	2800	1914	2080	608.4	0.3179	-0.4502
MW-54R	8	0	115	2280	1074	1100	657.5	0.6121	0.4031
MW-55	8	0	21300	40500	27475	22750	8186	0.2979	0.8518
OW-57ROUT	8	0	42	135	79.38	80	31.94	0.4024	0.393

Constituent: Sulfate Analysis Run 4/12/2022 9:25 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/18/2020 and 3/9/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 1 Wells = 12 Minimum Value = 0.5 Maximum Value = 1125 Mean Value = 332 Median Value = 266 Standard Deviation = 281.1 Coefficient of Variation = 0.8465 Skewness = 0.9137

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	352	1080	603.8	564.5	245.6	0.4069	0.8052
JCW-MW-18004	8	0	361	756	545.3	530	139.4	0.2556	0.2608
JCW-MW-18005	8	0	185	817	352.8	245	223.7	0.6341	1.246
JCW-MW-18006	8	0	29.7	94.5	47.83	42.55	21.2	0.4433	1.424
MW-50	8	0	338	1125	811.8	925.8	285.2	0.3513	-0.5682
MW-51	8	0	418	556	470.8	451	48.32	0.1026	0.8071
MW-52	8	1	0.5	654	441.1	551.5	243.9	0.5531	-1.09
MW-53	8	0	39.5	549	275.9	298	152.9	0.554	0.1246
MW-53R	8	0	71.7	275	184	183	57.92	0.3148	-0.462
MW-54R	8	0	67.1	100	83.04	78.45	12.43	0.1497	0.2695
MW-55	8	0	18.5	210	76.86	64.35	61.29	0.7974	1.333
OW-57ROUT	8	0	78.3	109	91.2	91.25	9.422	0.1033	0.551

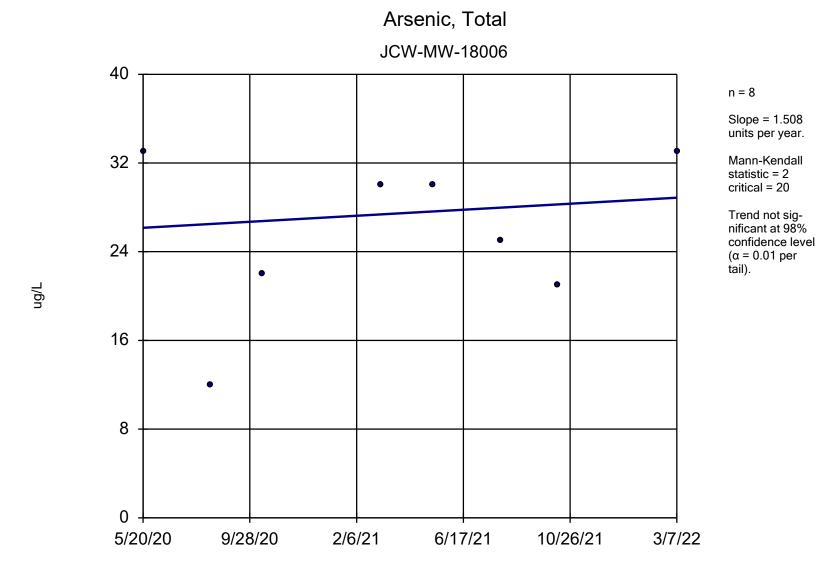
Constituent: Vanadium, Total Analysis Run 4/21/2022 5:01 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/18/2020 and 3/9/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 87 Wells = 12 Minimum Value = 2 Maximum Value = 12 Mean Value = 2.188 Median Value = 2 Standard Deviation = 1.069 Coefficient of Variation = 0.4888

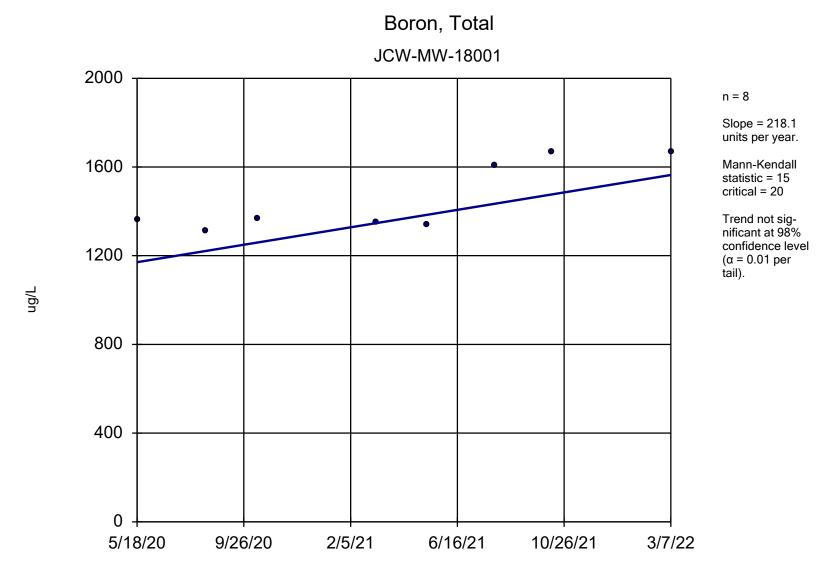
Skewness = 8.293

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	<u>CV</u>	<u>Skewness</u>
JCW-MW-18001	8	6	2	12	3.25	2	3.536	1.088	2.268
JCW-MW-18004	8	8	2	2	2	2	0	0	NaN
JCW-MW-18005	8	8	2	2	2	2	0	0	NaN
JCW-MW-18006	8	1	2	4	3	3	0.7559	0.252	0
MW-50	8	8	2	2	2	2	0	0	NaN
MW-51	8	8	2	2	2	2	0	0	NaN
MW-52	8	8	2	2	2	2	0	0	NaN
MW-53	8	8	2	2	2	2	0	0	NaN
MW-53R	8	8	2	2	2	2	0	0	NaN
MW-54R	8	8	2	2	2	2	0	0	NaN
MW-55	8	8	2	2	2	2	0	0	NaN
OW-57ROUT	8	8	2	2	2	2	0	0	NaN



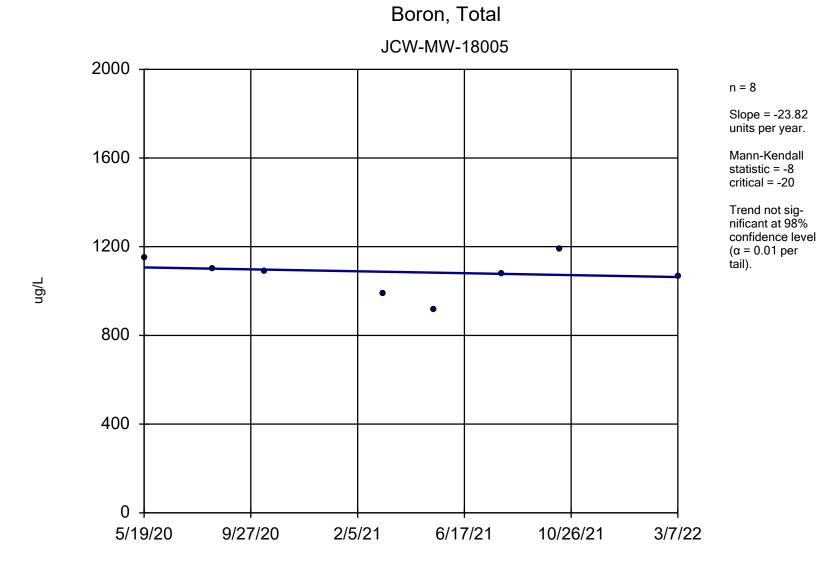
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



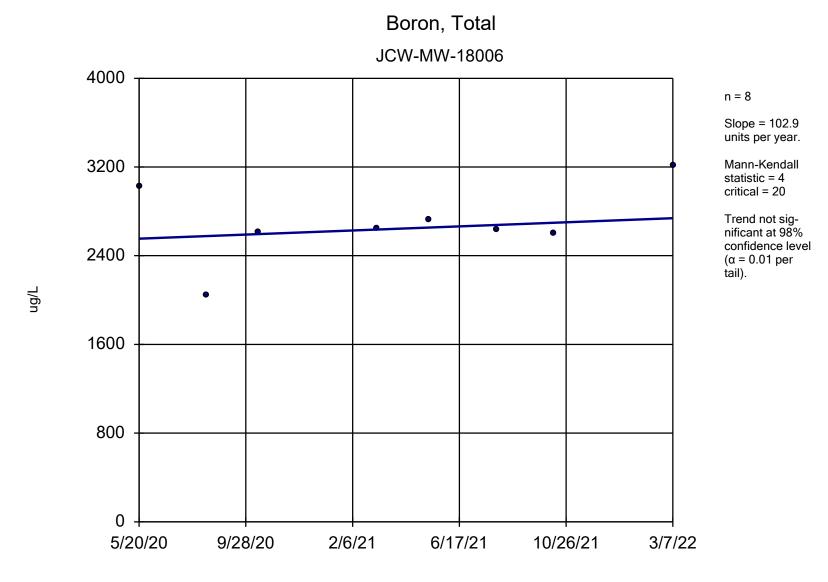
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



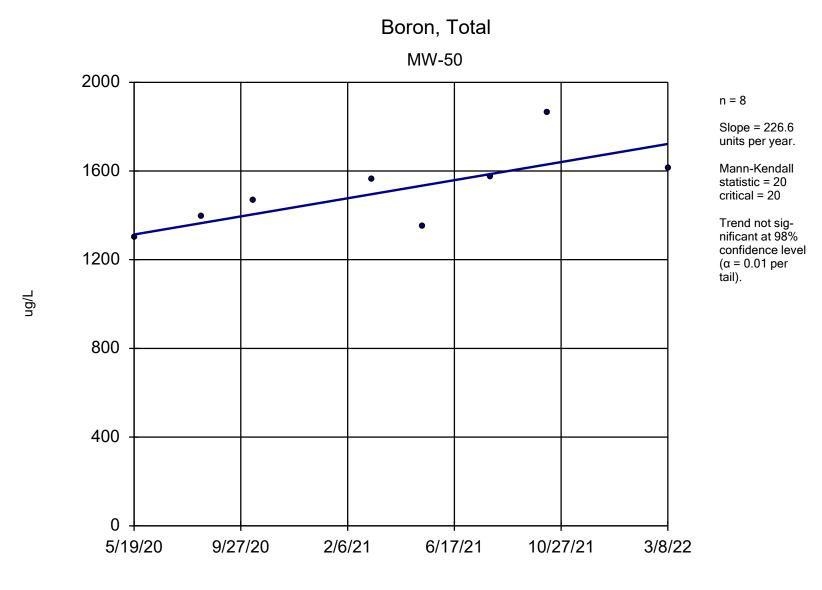
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



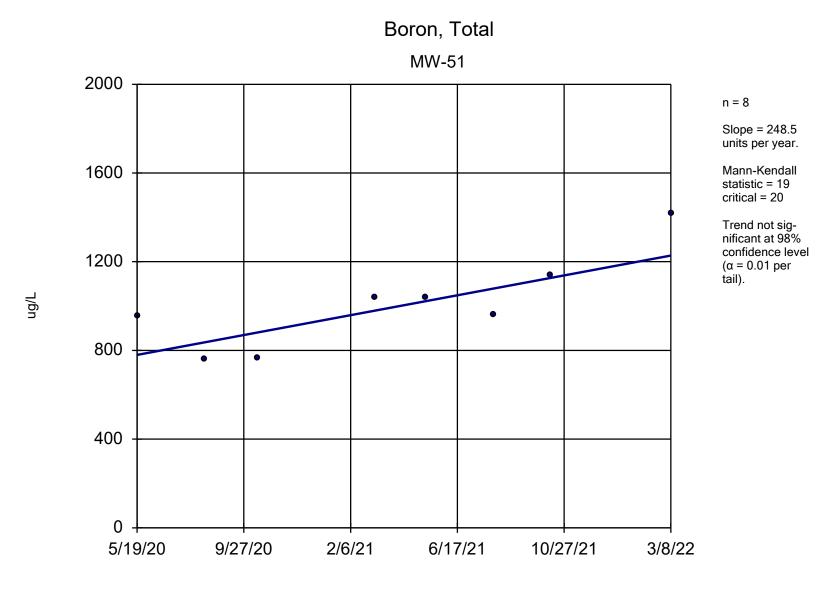
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



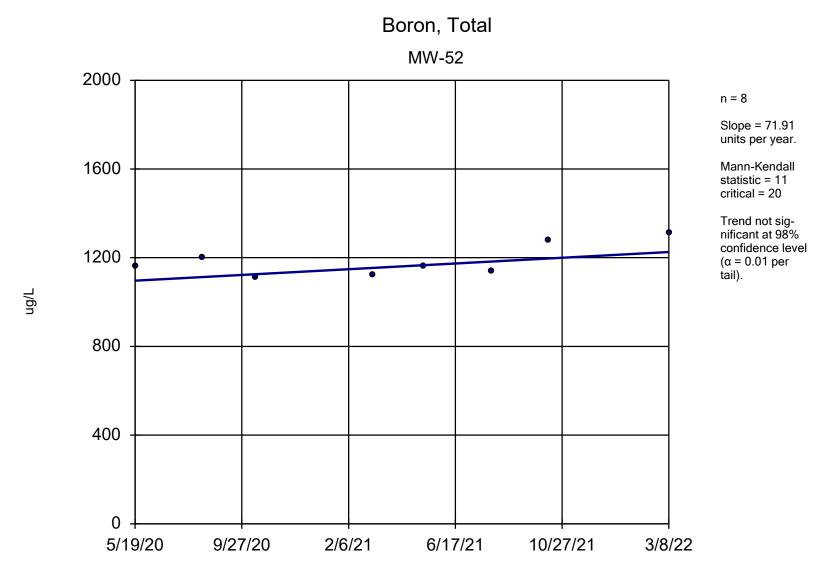
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



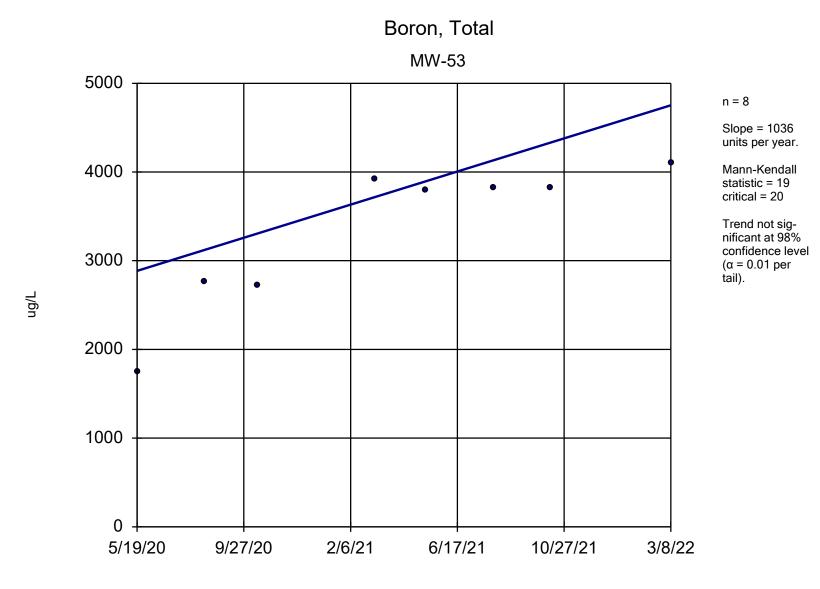
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



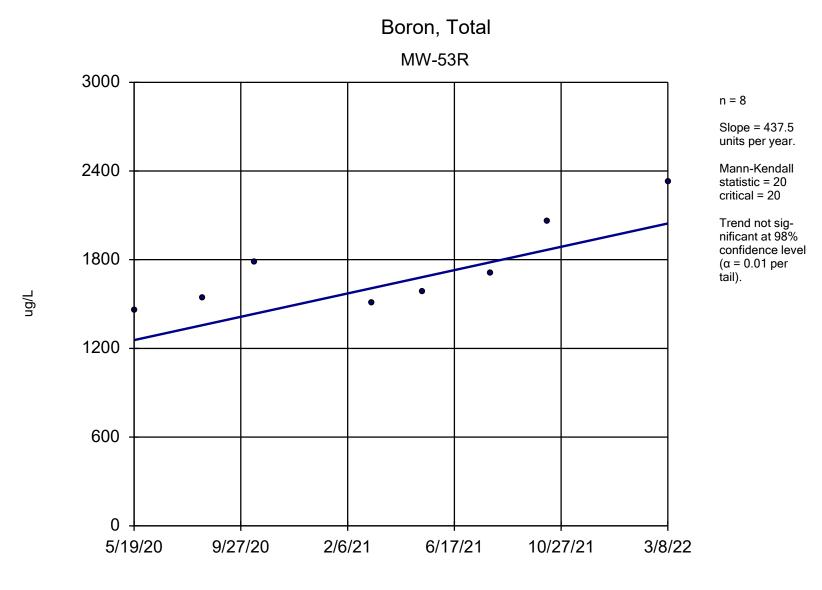
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



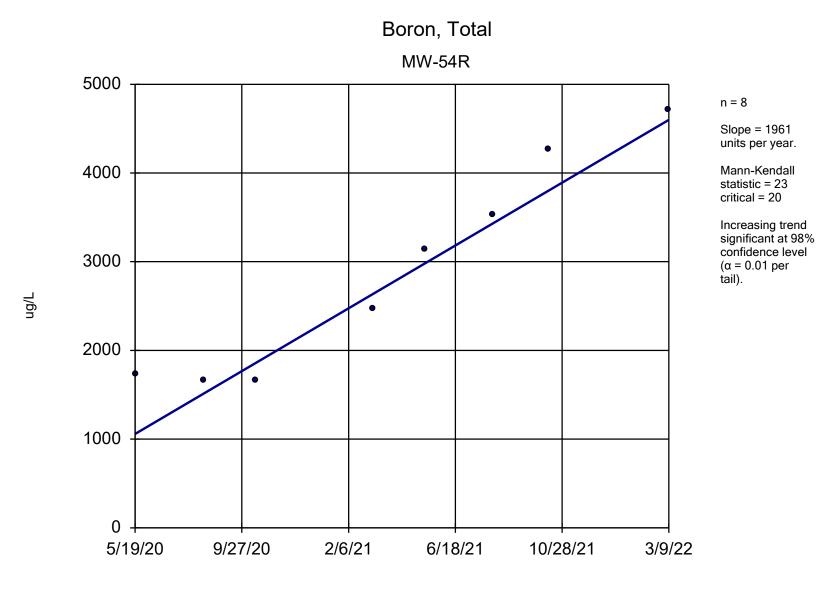
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



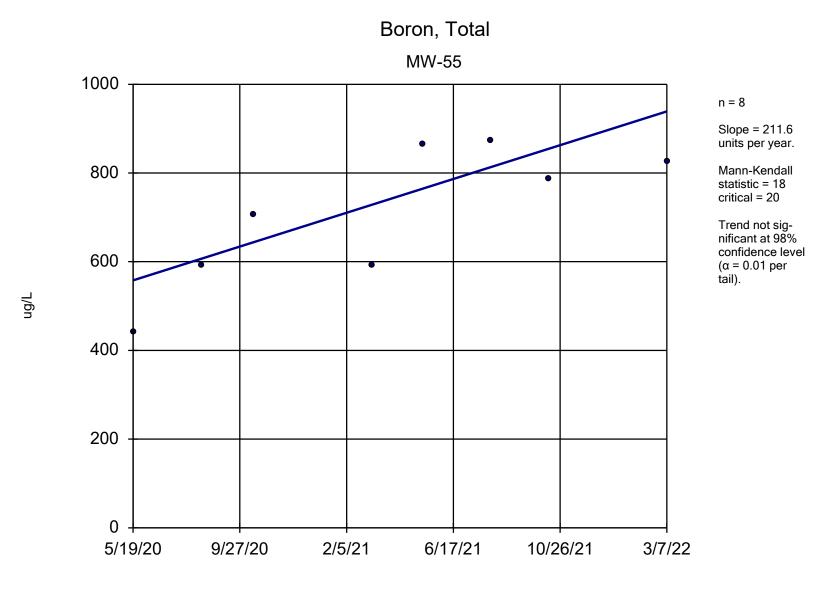
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



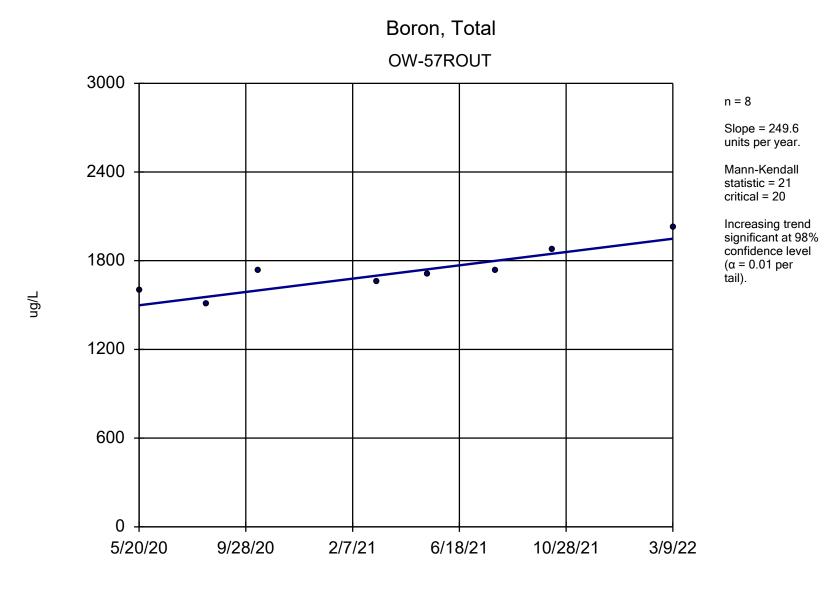
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



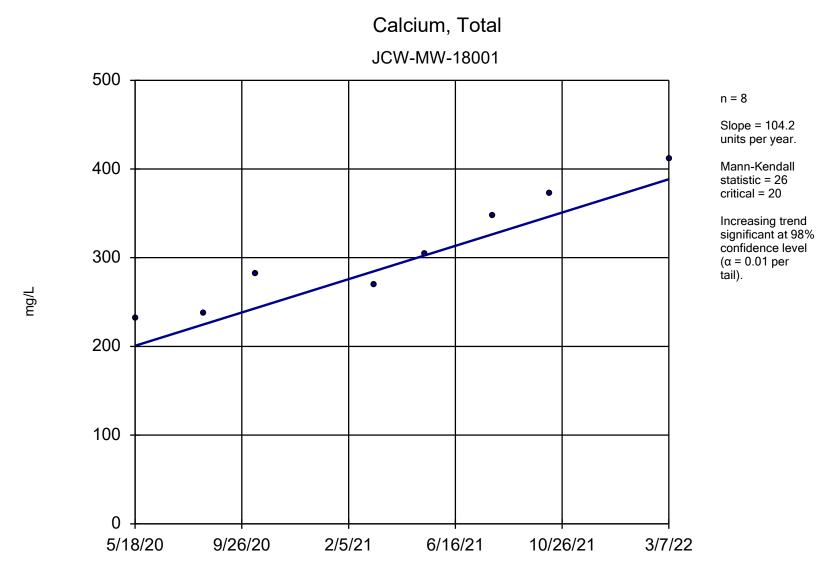
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



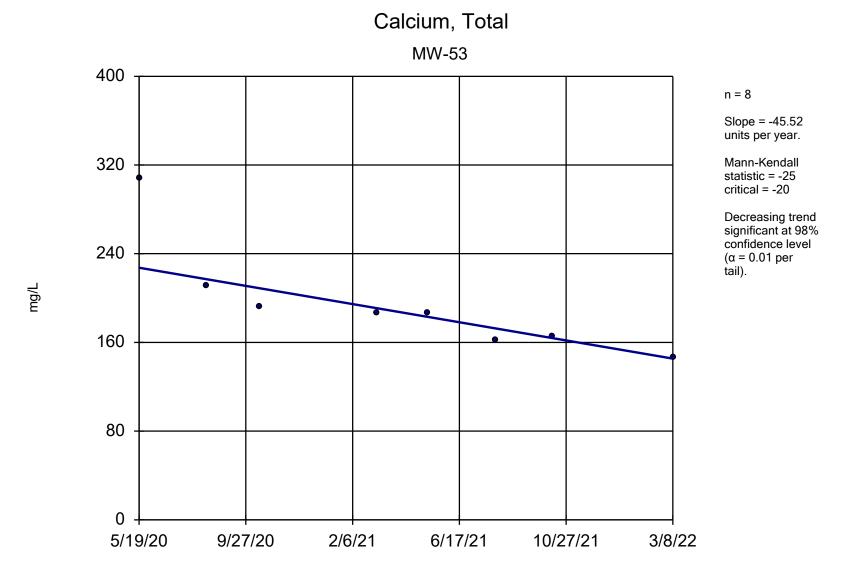
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

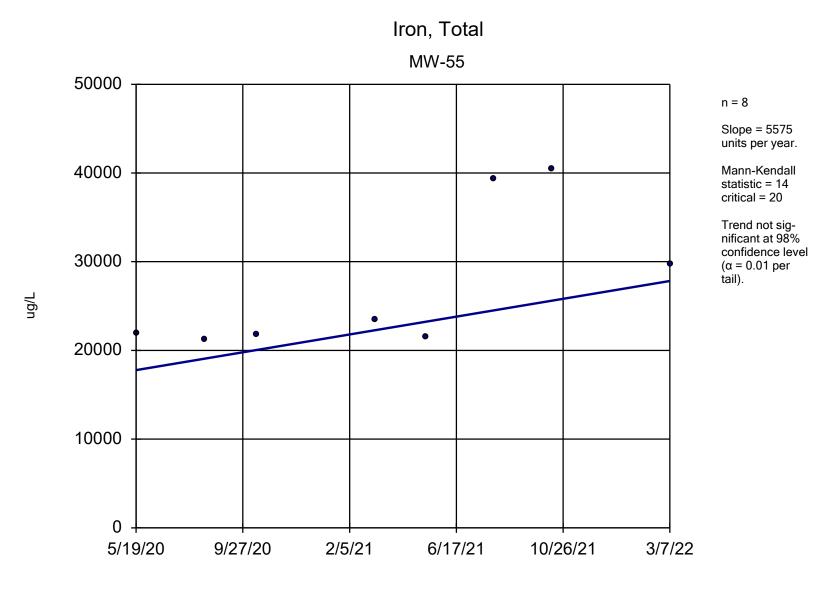


Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope Estimator Analysis Run 4/21/2022 5:03 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



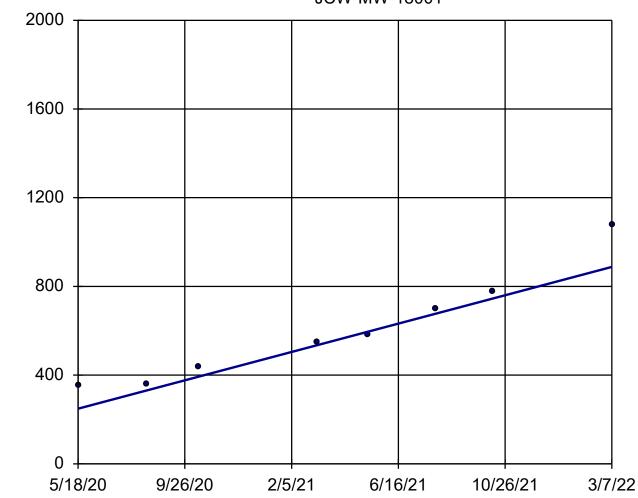
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

mg/L







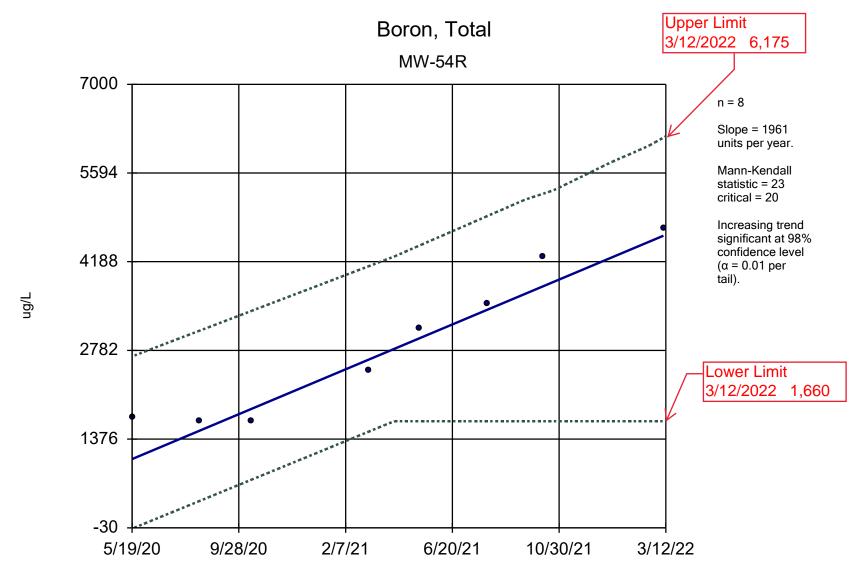
n = 8

Slope = 354.9 units per year.

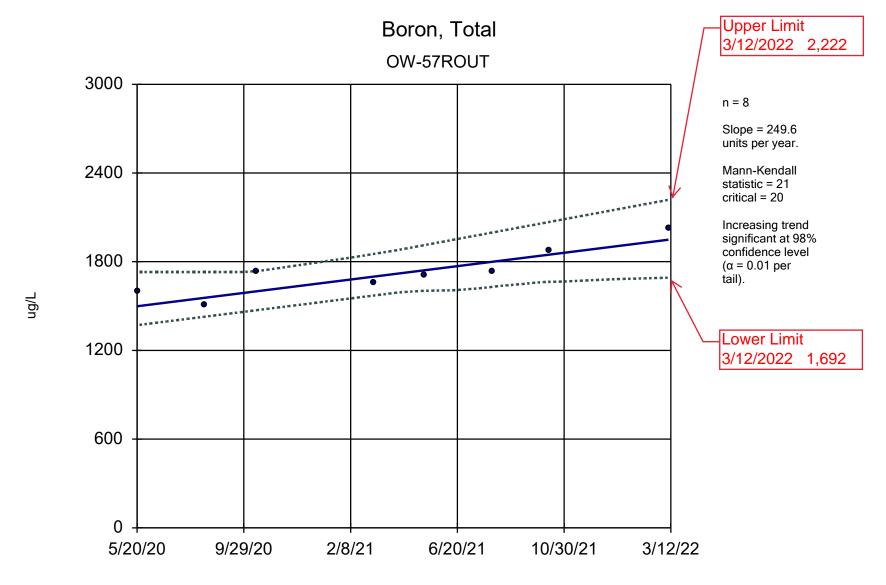
Mann-Kendall statistic = 28 critical = 20

Increasing trend significant at 98% confidence level ( $\alpha = 0.01$  per tail).

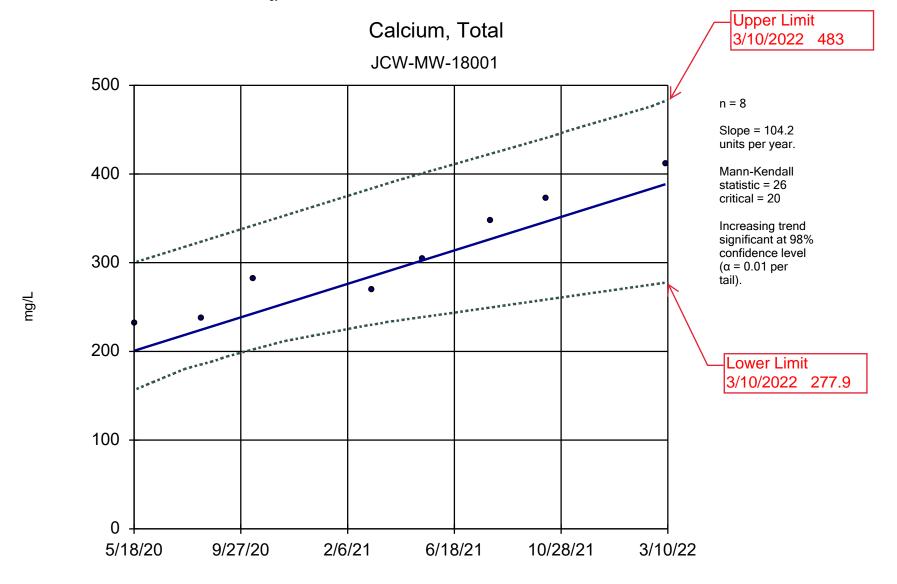
Sen's Slope Estimator Analysis Run 4/12/2022 9:31 AM



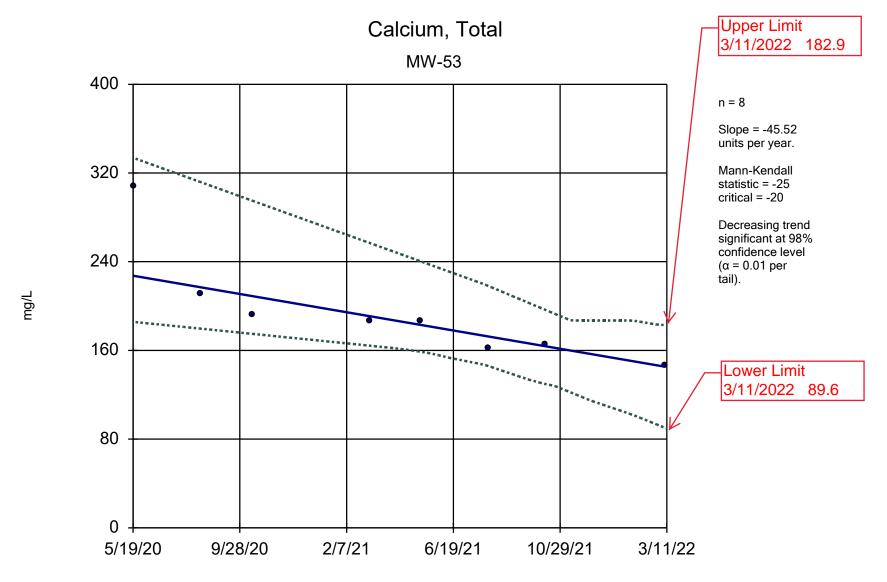
Sen's Slope and 98% Confidence Band Analysis Run 4/12/2022 9:58 AM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope and 98% Confidence Band Analysis Run 4/12/2022 9:59 AM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1



Sen's Slope and 98% Confidence Band Analysis Run 4/12/2022 10:00 AM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

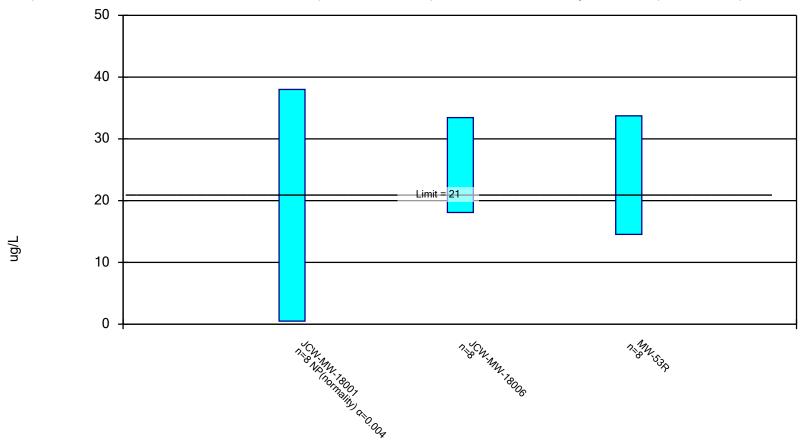


Sen's Slope and 98% Confidence Band Analysis Run 4/15/2022 10:51 AM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

Sen's Slope and 98% Confidence Band Analysis Run 4/12/2022 10:01 AM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

# Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Arsenic, Total Analysis Run 4/12/2022 11:10 AM

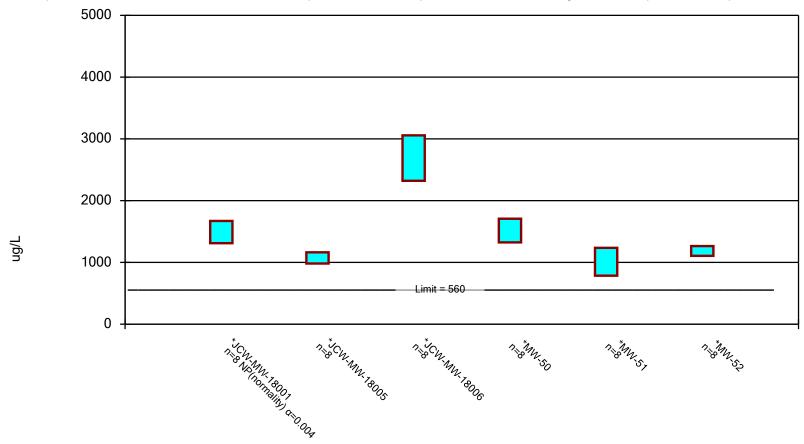
Constituent: Arsenic, Total (ug/L) Analysis Run 4/12/2022 11:11 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	JCW-MW-18001	JCW-MW-18006	MW-53R
5/18/2020	3		
5/19/2020			27
5/20/2020		33	
8/10/2020	3		
8/11/2020		12	31
10/13/2020	3		
10/14/2020		22	40
3/8/2021	2		19
3/9/2021		30	
5/10/2021	2		18
5/11/2021		30	
8/2/2021	38		23
8/3/2021		25	
10/11/2021	1		25
10/12/2021		21	
3/7/2022	<1	33	
3/8/2022			10
Mean	6.563	25.75	24.13
Std. Dev.	12.74	7.246	9.047
Upper Lim.	38	33.43	33.71
Lower Lim.	0.5	18.07	14.54

#### 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 4/12/2022 10:15 AM

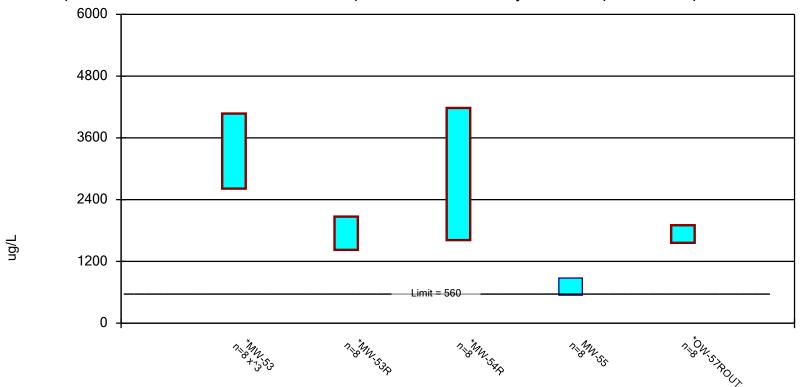
Constituent: Boron, Total (ug/L) Analysis Run 4/12/2022 10:16 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	JCW-MW-18001	JCW-MW-18005	JCW-MW-18006	MW-50	MW-51	MW-52
5/18/2020	1360					
5/19/2020		1150		1300	955.5 (D)	1160
5/20/2020			3030			
8/10/2020	1310			1395 (D)	758	1200
8/11/2020		1100	2040			
10/13/2020	1370			1470		
10/14/2020		1090	2610		768.5 (D)	1110
3/8/2021	1350			1560 (D)	1040	1120
3/9/2021		987	2650			
5/10/2021	1340			1350 (D)	1040	1160
5/11/2021		919	2720			
8/2/2021	1610			1575 (D)	960	1140
8/3/2021		1080	2640			
10/11/2021	1670			1865 (D)	1140	1280
10/12/2021		1190	2600			
3/7/2022	1670	1065 (D)	3220			
3/8/2022				1615 (D)	1420	1310
Mean	1460	1073	2689	1516	1010	1185
Std. Dev.	159.4	86.07	346.1	180.5	211.8	73.68
Upper Lim.	1670	1164	3056	1708	1235	1263
Lower Lim.	1310	981.4	2322	1325	785.7	1107

#### Parametric Confidence Interval

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



Statistically significant trends observed for boron at MW-54R and OW-57R OUT. Confidence bands are used in place of confidence intervals

Constituent: Boron, Total Analysis Run 4/12/2022 10:15 AM

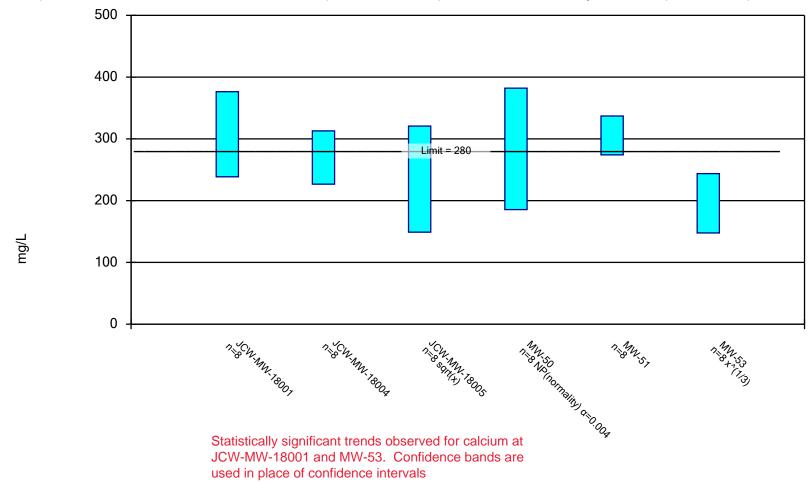
Constituent: Boron, Total (ug/L) Analysis Run 4/12/2022 10:16 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	MW-53	MW-53R	MW-54R	MW-55	OW-57ROUT
5/19/2020	1750	1460	1730	441	
5/20/2020					1600
8/10/2020	2760				
8/11/2020		1540	1660	592	1510
10/14/2020	2720	1780	1660	705	1730
3/8/2021	3920	1510	2470		
3/9/2021				593	1660
5/10/2021	3790	1580			
5/11/2021			3140	866	1710
8/2/2021	3820	1710			
8/3/2021			3530	873	1730
10/11/2021	3820	2060	4270		
10/12/2021				788	1880
3/7/2022				826	
3/8/2022	4100	2330			
3/9/2022			4720		2030
Mean	3335	1746	2898	710.5	1731
Std. Dev.	830.3	304.6	1211	156	161.7
Upper Lim.	4073	2069	4182	875.9	1903
Lower Lim.	2613	1423	1613	545.1	1560

#### Parametric and Non-Parametric (NP) Confidence Interval

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



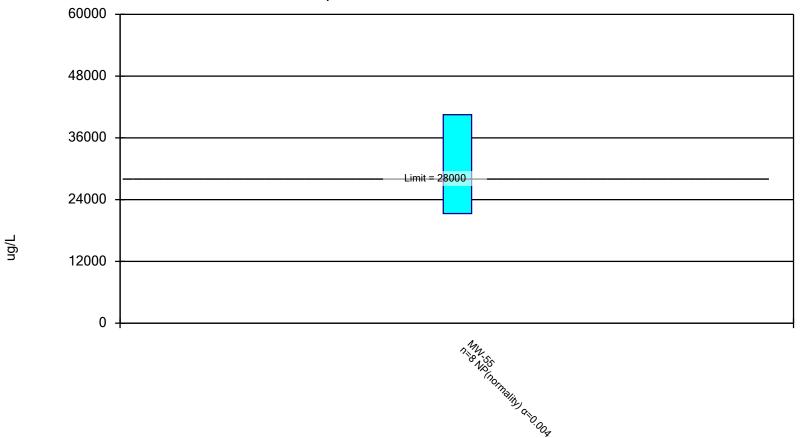
Constituent: Calcium, Total Analysis Run 4/12/2022 10:15 AM

Constituent: Calcium, Total (mg/L) Analysis Run 4/12/2022 10:16 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	JCW-MW-18001	JCW-MW-18004	JCW-MW-18005	MW-50	MW-51	MW-53
5/18/2020	232					
5/19/2020		308	419	380	326.5 (D)	308
8/10/2020	237			382 (D)	341	211
8/11/2020		306	259			
10/13/2020	282			368		
10/14/2020		323	195		333.5 (D)	192
3/8/2021	270	252		380.5 (D)	293	187
3/9/2021			286			
5/10/2021	305			366.5 (D)	303	187
5/11/2021		266	202			
8/2/2021	348			259.5 (D)	276	162
8/3/2021		203	149			
10/11/2021	373			267.5 (D)	316	166
10/12/2021		264	193			
3/7/2022	412	236	161.5 (D)			
3/8/2022				185.5 (D)	255	146
Mean	307.4	269.8	233.1	323.7	305.5	194.9
Std. Dev.	65.01	40.65	88.04	75.56	29.71	49.99
Upper Lim.	376.3	312.8	320.8	382	337	243.7
Lower Lim.	238.5	226.7	148.9	185.5	274	147.7

#### Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Iron, Total Analysis Run 4/12/2022 10:15 AM

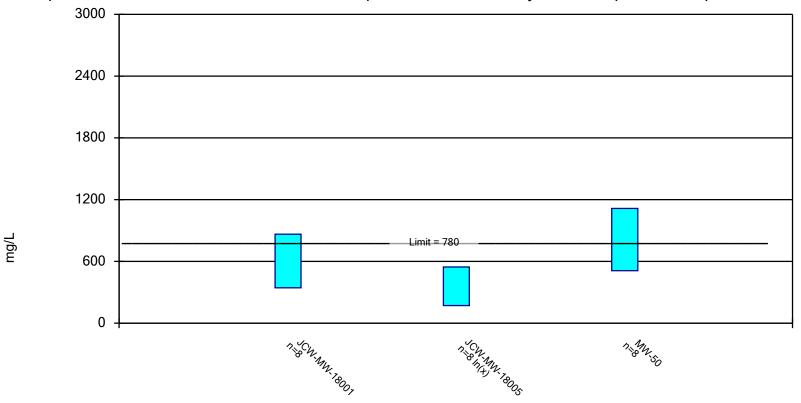
Constituent: Iron, Total (ug/L) Analysis Run 4/12/2022 10:16 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	MW-55
5/19/2020	22000
8/11/2020	21300
10/14/2020	21800
3/9/2021	23500
5/11/2021	21500
8/3/2021	39400
10/12/2021	40500
3/7/2022	29800
Mean	27475
Std. Dev.	8186
Upper Lim.	40500
Lower Lim.	21300

#### Parametric Confidence Interval

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



Statistically significant trend observed for sulfate at JCW-MW-18001. Confidence bands are used in place of confidence interval

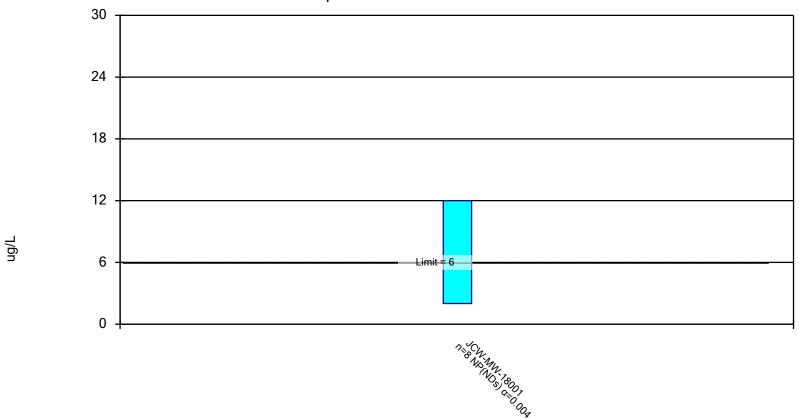
Constituent: Sulfate Analysis Run 4/12/2022 10:15 AM

Constituent: Sulfate (mg/L) Analysis Run 4/12/2022 10:16 AM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	JCW-MW-18001	JCW-MW-18005	MW-50
5/18/2020	352		
5/19/2020		817	1010
8/10/2020	357		1030 (D)
8/11/2020		398	
10/13/2020	435		990
10/14/2020		185	
3/8/2021	549		1125 (D)
3/9/2021		535	
5/10/2021	580		861.5 (D)
5/11/2021		263	
8/2/2021	700		636 (D)
8/3/2021		190	
10/11/2021	777		504 (D)
10/12/2021		227	
3/7/2022	1080	207.5 (D)	
3/8/2022			338 (D)
Mean	603.8	352.8	811.8
Std. Dev.	245.6	223.7	285.2
Upper Lim.	864.1	545	1114
Lower Lim.	343.4	171.2	509.5

#### Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



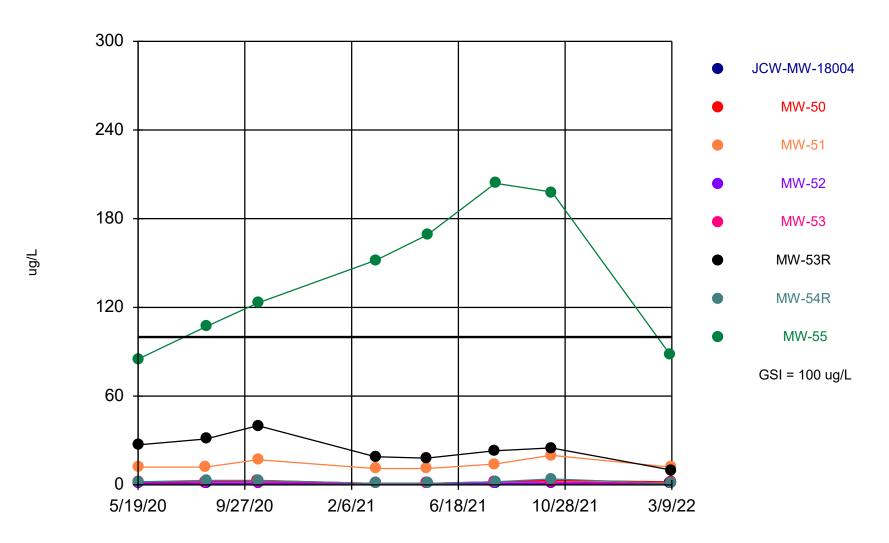
Constituent: Vanadium, Total Analysis Run 4/12/2022 10:15 AM

Constituent: Vanadium, Total (ug/L) Analysis Run 4/12/2022 10:16 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	JCW-MW-18001
5/18/2020	<2
8/10/2020	<2
10/13/2020	<2
3/8/2021	<2
5/10/2021	2
8/2/2021	12
10/11/2021	<2
3/7/2022	<2
Mean	3.25
Std. Dev.	3.536
Upper Lim.	12
Lower Lim.	2

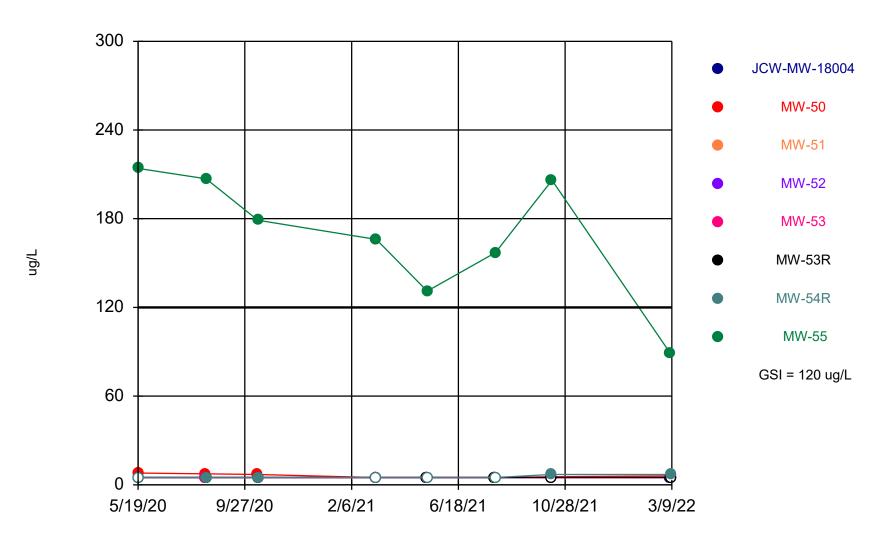
# Attachment 2 GSI Evaluation Sanitas™ Output Files

# Arsenic Comparison to GSI



Time Series Analysis Run 4/12/2022 11:53 AM

# Molybdenum Comparison to GSI



Time Series Analysis Run 4/12/2022 11:54 AM

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. EP

#### **Summary Report**

Constituent: Arsenic, Total Analysis Run 4/12/2022 11:56 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/19/2020 and 3/9/2022, a summary of the selected data set:

Observations = 64 ND/Trace = 17 Wells = 8 Minimum Value = 1 Maximum Value = 204 Mean Value = 23.27 Median Value = 2 Standard Deviation = 48.19 Coefficient of Variation = 2.071 Skewness = 2.593

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18004	8	8	1	1	1	1	0	0	NaN
MW-50	8	0	1	3	1.875	2	0.8345	0.4451	0.2217
MW-51	8	0	11	20	13.63	12	3.249	0.2384	1.107
MW-52	8	7	1	1	1	1	0	0	NaN
MW-53	8	2	1	2	1.625	2	0.5175	0.3185	-0.5164
MW-53R	8	0	10	40	24.13	24	9.047	0.375	0.2406
MW-54R	8	0	1	4	2.125	2	1.126	0.5299	0.3911
MW-55	8	0	85	204	140.8	137.5	47.13	0.3348	0.1467

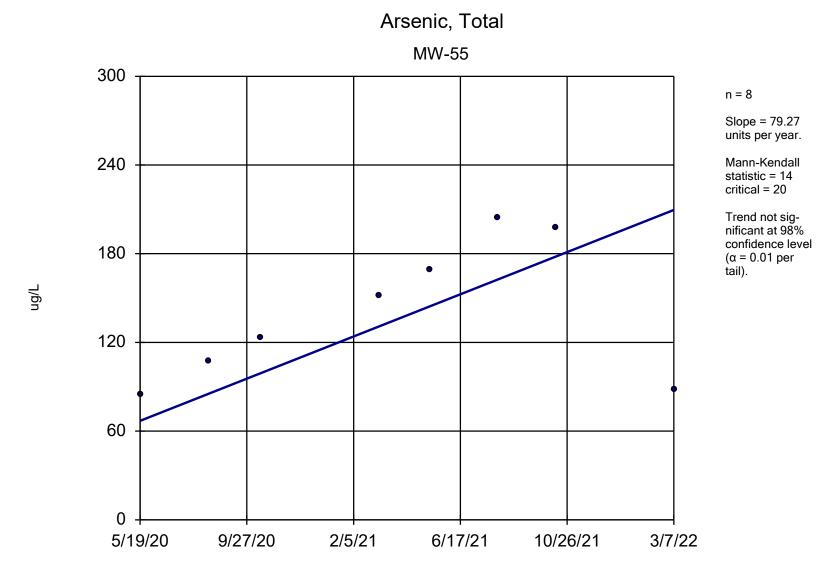
#### **Summary Report**

Constituent: Molybdenum, Total Analysis Run 4/12/2022 11:56 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

For observations made between 5/19/2020 and 3/9/2022, a summary of the selected data set:

Observations = 64 ND/Trace = 47 Wells = 8 Minimum Value = 5 Maximum Value = 214 Mean Value = 25.66 Median Value = 5 Standard Deviation = 56.32 Coefficient of Variation = 2.195 Skewness = 2.516

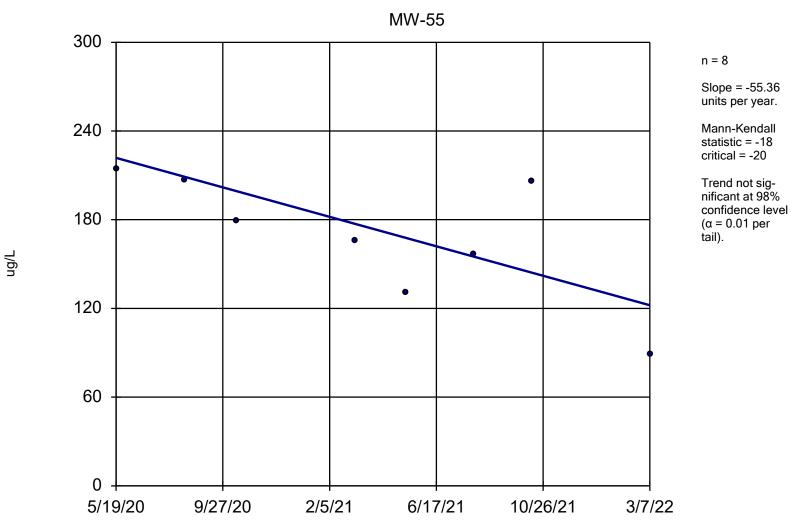
<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18004	8	8	5	5	5	5	0	0	NaN
MW-50	8	3	5	8	6.125	5.75	1.217	0.1988	0.4523
MW-51	8	8	5	5	5	5	0	0	NaN
MW-52	8	8	5	5	5	5	0	0	NaN
MW-53	8	8	5	5	5	5	0	0	NaN
MW-53R	8	8	5	5	5	5	0	0	NaN
MW-54R	8	4	5	7	5.5	5	0.9258	0.1683	1.155
MW-55	8	0	89	214	168.6	172.5	42.98	0.2549	-0.6854



Sen's Slope Estimator Analysis Run 4/12/2022 12:00 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

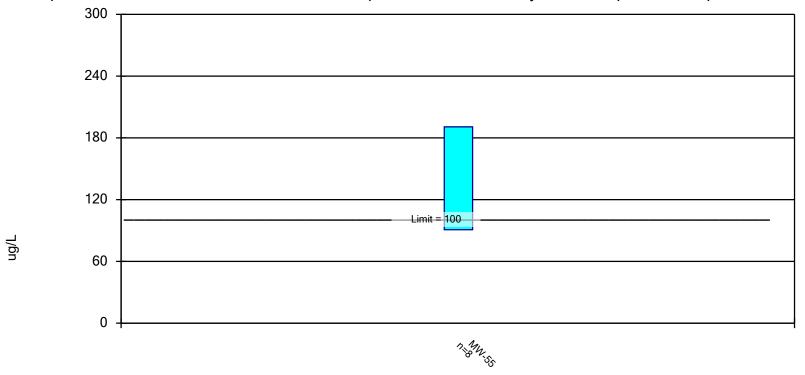
# Molybdenum, Total



Sen's Slope Estimator Analysis Run 4/12/2022 12:00 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

#### 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 4/12/2022 12:12 PM

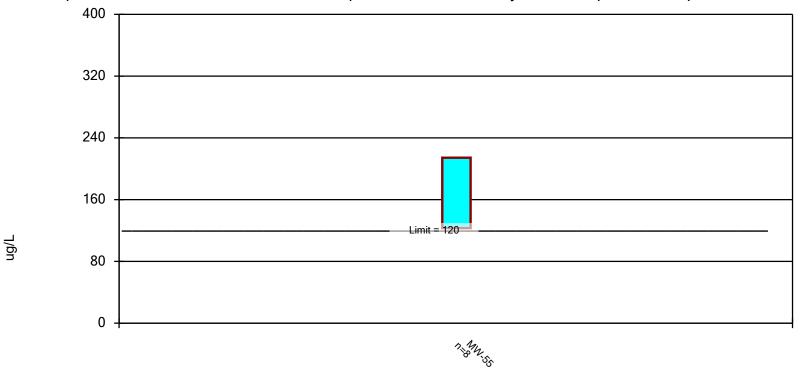
Constituent: Arsenic, Total (ug/L) Analysis Run 4/12/2022 12:13 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	MW-55
5/19/2020	85
8/11/2020	107
10/14/2020	123
3/9/2021	152
5/11/2021	169
8/3/2021	204
10/12/2021	198
3/7/2022	88
Mean	140.8
Std. Dev.	47.13
Upper Lim.	190.7
Lower Lim.	90.8

#### Parametric Confidence Interval

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



Using the number of significant figures consistent with the GSI criterion, the lower confidence limit at MW-55 is equal to the GSI criterion; therefore the limit is not exceeded

Constituent: Molybdenum, Total Analysis Run 4/12/2022 12:12 PM

Constituent: Molybdenum, Total (ug/L) Analysis Run 4/12/2022 12:13 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q1

	MW-55
5/19/2020	214
8/11/2020	207
10/14/2020	179
3/9/2021	166
5/11/2021	131
8/3/2021	157
10/12/2021	206
3/7/2022	89
Mean	168.6
Std. Dev.	42.98
Upper Lim.	214.2
Lower Lim.	123.1



# Appendix E Laboratory Analytical Report



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: March 24, 2022

Subject: PART 115 GROUNDWATER MONITORING – JCW POREWATER – 2022 Q1

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Environmental Corporation

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0150

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site on 03/07/2022 through 03/09/2022, for the 1<sup>st</sup> 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 03/09/2022 and 03/10/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate.

The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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:

<u>Description</u>
Reporting Limit
Result not detected or below Reporting Limit
Non TNI Analyte
Laboratory Control Sample
Laboratory Reagent Blank (also referred to as Method Blank)
Duplicate
Matrix Spike
Matrix Spike Duplicate
Relative Percent Difference
Method Detection Limit
Practical Quantitation Limit
Target Detection Limit
Standard Methods Compendium

Qualifier	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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



#### **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q1-2022 Weadock Porewater Wells

**Date Received:** 3/09/2022 and 03/10/2022

Chemistry Project: 22-0150

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0150-01	JCW-MW-18001	Groundwater	03/07/2022 06:54 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-02	JCW-MW-18004	Groundwater	03/07/2022 07:57 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-03	JCW-MW-18005	Groundwater	03/07/2022 12:20 PM	JCW Solid Waste Disposal Area, Porewater
22-0150-04	JCW-MW-18006	Groundwater	03/07/2022 01:12 PM	JCW Solid Waste Disposal Area, Porewater
22-0150-05	MW-50	Groundwater	03/08/2022 07:35 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-06	MW-51	Groundwater	03/08/2022 08:08 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-07	MW-52	Groundwater	03/08/2022 09:00 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-08	MW-53	Groundwater	03/08/2022 09:35 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-09	MW-53R	Groundwater	03/08/2022 01:09 PM	JCW Solid Waste Disposal Area, Porewater
22-0150-10	MW-54R	Groundwater	03/09/2022 07:05 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-11	MW-55	Groundwater	03/07/2022 09:43 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-12	OW-57R OUT	Groundwater	03/09/2022 08:31 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-13	MW-58	Groundwater	03/07/2022 02:06 PM	JCW Solid Waste Disposal Area, Porewater
22-0150-14	DUP-JCW-LF-01	Groundwater	03/07/2022 12:00 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-15	DUP-JCW-LF-02	Groundwater	03/08/2022 12:00 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-16	JCW-MW-18001 MS	Groundwater	03/07/2022 06:54 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-17	JCW-MW-18001 MSD	Groundwater	03/07/2022 06:54 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-18	FB-01	Water	03/09/2022 08:45 AM	JCW Solid Waste Disposal Area, Porewater
22-0150-19	EB-01	Water	03/09/2022 08:40 AM	JCW Solid Waste Disposal Area, Porewater

#### **Analytical Report**

Report Date:

03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18001
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-01
 Collect Time:
 06:54 AM

Matrix: Groundwater

Mercury by EPA 7470A, To	Aliquot #: 22-0	Aliquot #: 22-0150-01-C01-A01			
Parameter(s)	Result	Flag Un	ts RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCF	R Rule Appendix III-IV To	ndix III-IV Total Metals Exp		Aliquot #: 22-0150-01-C01-A02	
Parameter(s)	Result	Flag Un	-	Analysis Date	Analyst: EB Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	129	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1670	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	412000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	2	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	86	ug/L	20.0	03/15/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	87	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	106000	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	1050	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	6	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	16000	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	166000	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, CI, F,	SO4, Aqueous	6 Aliquot #: 22-0	0150-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Un	•	Analysis Date	Tracking
Chloride	60000	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	1080000	ug/L	1000.0	03/11/2022	AB22-0310-07



#### **Analytical Report**

**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0150** 

 Field Sample ID:
 JCW-MW-18001
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-01
 Collect Time:
 06:54 AM

Matrix: Groundwater

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0150-01-C03-A01		Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Total Dissolved Solids	2310	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	150-01-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	677000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	677000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11

#### **Analytical Report**

Report Date:

03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18004
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-02
 Collect Time:
 07:57 AM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueous				Aliquot #: 22-0150-02-C01-A01		Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR	Aliquot #: 22-0	150-02-C01-A02	Analyst: EB			
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	32		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	259		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	236000		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	1		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	952		ug/L	20.0	03/15/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	34		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	90400		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	242		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	4		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	1880		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	36000		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L		2.0	03/15/2022	AB22-0316-08
Vanadium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analvte List. Cl. F.:	SO4. Agu	eous	Aliguot #: 22-0	150-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	19600	J	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	537000		ug/L	1000.0	03/11/2022	AB22-0310-07
			5			



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18004
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-02
 Collect Time:
 07:57 AM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	150-02-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Total Dissolved Solids	1280	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	150-02-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Alkalinity Total	421000	ug/L	10000.0	03/14/2022	AB22-0314-12
Alkalinity Bicarbonate	421000	ug/L	10000.0	03/14/2022	AB22-0314-12
Alkalinity Carbonate	ND	ug/L	10000.0	03/14/2022	AB22-0314-12

Report Date:

03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18005
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-03
 Collect Time:
 12:20 PM

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	0150-03-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Uni	ts RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp		tal Metals Exp	Aliquot #: 22-0	0150-03-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Uni	-	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	5	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	108	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1030	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	159000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	3300	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	32	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	64400	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	217	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	5	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	10	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	2090	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	3	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	64200	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, Cl, F,	SO4, Aqueous	Aliquot #: 22-0	0150-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Uni	-	Analysis Date	Tracking
Chloride	61700	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	204000	ug/L	1000.0	03/11/2022	AB22-0310-07



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18005
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-03
 Collect Time:
 12:20 PM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	150-03-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL.	Analysis Date	Tracking
Total Dissolved Solids	942	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	)150-03-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Alkalinity Total	525000	ug/L	10000.0	03/14/2022	AB22-0314-12
Alkalinity Bicarbonate	525000	ug/L	10000.0	03/14/2022	AB22-0314-12
Alkalinity Carbonate	ND	ug/L	10000.0	03/14/2022	AB22-0314-12



03/24/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18006
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-04
 Collect Time:
 01:12 PM

Mercury by EPA 7470A, Total, A	queous			Allquot #. ZZ-0	150-04-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp		Aliquot #: 22-0150-04-C01-A02		Analyst: EB		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	33		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	665		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	3220		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	143000		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	9040		ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	63		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	50000		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	340		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	6		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	9290		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	93700		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	4		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR Rule	Analyte List CLF	SO4. Agu	eous	Δliquot #• 22-0	150-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	75000	•	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0310-07
			g, <del>-</del>	.000.0	50, . 5, _ 5 _ 5	00.001



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: 22-0150

Field Sample ID: **JCW-MW-18006**Lab Sample ID: 22-0150-04

Collect Date: 03/07/2022 Collect Time: 01:12 PM

Total Dissolved Solids by SM 2540C			Aliquot #: 22	-0150-04-C03-A01	1 Analyst: CLH
Parameter(s)	Result	Flag U	nits RL	Analysis Date	e Tracking
Total Dissolved Solids	792	mg,	L 10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22	-0150-04-C04-A01	1 Analyst: DLS
Parameter(s)	Result	Flag U	nits RL	Analysis Date	e Tracking
Alkalinity Total	621000	ug/	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	621000	ug/	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/	10000.0	03/15/2022	AB22-0315-11



03/24/22

Report Date:



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-50
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-05
 Collect Time:
 07:35 AM

Mercury by EPA 7470A, Total, Aqueous			Aliquot #: 22-0	150-05-C01-A01	Analyst: CLH	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCF	R Rule Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	150-05-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	2		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	115		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1610		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	186000		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	1		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	1400		ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	77		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	50200		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	561		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	6		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	10200		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	67000		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, Cl. F.	SO4. Agi	ieous	Aliguot #: 22-0	150-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	54900	3	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	346000		ug/L	1000.0	03/10/2022	AB22-0310-07
Janato	0.10000		~9, <del>_</del>	1000.0	00/10/2022	



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-50
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-05
 Collect Time:
 07:35 AM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	150-05-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
Total Dissolved Solids	999	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	150-05-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
Alkalinity Total	441000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	441000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-51
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-06
 Collect Time:
 08:08 AM

Mercury by EPA 7470A, Total, Aqueous		Aliquot #: 22-0	0150-06-C01-A01	Analyst: CLH	
Parameter(s)	Result	Flag Unit	s RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp		Aliquot #: 22-0	0150-06-C01-A02	Analyst: EB	
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	12	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	198	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1420	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	255000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	1310	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	58	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	66900	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	937	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	7120	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	3	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	125000	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, CI, F,	SO4, Aqueous	Aliquot #: 22-0	0150-06-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Unit	•	Analysis Date	Tracking
Chloride	91100	ug/L	1000.0	03/11/2022	AB22-0310-07
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	446000	ug/L	1000.0	03/11/2022	AB22-0310-07



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-51
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-06
 Collect Time:
 08:08 AM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	150-06-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Un	ts RL	Analysis Date	Tracking
Total Dissolved Solids	1480	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	)150-06-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Un	ts RL	Analysis Date	Tracking
Alkalinity Total	616000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	616000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-52
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-07
 Collect Time:
 09:00 AM

Mercury by EPA 7470A, Total, Aqueo	us			Aliquot #: 22-0	150-07-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ι	ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR Rule App	endix III-IV To	tal Metals	Ехр	Aliquot #: 22-0	150-07-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	ND	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	170	ι	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1310	ι	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ι	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	251000	ι	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ι	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	1	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	2870	ι	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	27	ι	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	114000	ι	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	526	ι	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND	ι	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND	ι	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	5160	ι	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2	ι	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ι	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	76300	ι	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ι	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ι	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ι	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR Rule Analy	vtelist CLF	SO4 Aque	eous	Aliquot #: 22-0	150-07-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	51600	•	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0310-07 AB22-0310-07
Sulfate	654000		-		03/10/2022	AB22-0310-07 AB22-0310-07
Sullate	004000	(	ug/L	1000.0	03/11/2022	ADZZ-U31U-U/



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-52
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-07
 Collect Time:
 09:00 AM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	150-07-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1520	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	150-07-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	474000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	474000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22

22-0150



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project:

 Field Sample ID:
 MW-53
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-08
 Collect Time:
 09:35 AM

Mercury by EPA 7470A, Total, Aqueou	us			Aliquot #: 22-0	150-08-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR Rule Appe	endix III-IV To	otal Metals	s Ехр	Aliquot #: 22-0	150-08-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	1		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	401		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	4100		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	146000		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	1130		ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	48		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	40200		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	432		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	8860		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	3		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	94200		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR Rule Analy	rtelist CIF	SO4 Agu	ieous	Alignot #: 22-0	150-08-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	81100	- 3	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L ug/L	1000.0	03/10/2022	AB22-0310-07 AB22-0310-07
Sulfate	39500		-		03/10/2022	AB22-0310-07 AB22-0310-07
Sullate	39300		ug/L	1000.0	03/10/2022	ADZZ-U31U-U/



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-53
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-08
 Collect Time:
 09:35 AM

Total Dissolved Solids by SM 2540C	Aliquot #: 22-0	150-08-C03-A01	Analyst: CLH		
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Total Dissolved Solids	768	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	150-08-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Alkalinity Total	577000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	577000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-53R
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-09
 Collect Time:
 01:09 PM

Mercury by EPA 7470A, Total, Aqueo	us			Aliquot #: 22-0	150-09-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND	u	ıg/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCR Rule App	endix III-IV To	otal Metals E	Ξхр	Aliquot #: 22-0	150-09-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Arsenic	10	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Barium	203	u	ıg/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Boron	2330	u	ıg/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	u	ıg/L	0.2	03/15/2022	AB22-0316-08
Calcium	188000	u	ıg/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	u	ıg/L	6.0	03/15/2022	AB22-0316-08
Copper	2	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Iron	1080	u	ıg/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Lithium	56	u	ıg/L	10.0	03/15/2022	AB22-0316-08
Magnesium	57100	u	ıg/L	1000.0	03/16/2022	AB22-0316-08
Manganese	315	u	ıg/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND	u	ıg/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND	u	ıg/L	2.0	03/15/2022	AB22-0316-08
Potassium	6670	u	ıg/L	100.0	03/16/2022	AB22-0316-08
Selenium	2	u	ıg/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	u	ıg/L	0.2	03/15/2022	AB22-0316-08
Sodium	48700	u	ıg/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	u	ıg/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	u	ıg/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	u	ıg/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR Rule Analy	rtelist CIF	SO4 Aque	ous	Aliquot #: 22-0	150-09-C02-A01	Analyst: DMW
Parameter(s)	Result		Units	RL	Analysis Date	Tracking
Chloride	39900	•	ıg/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ıg/∟ ıg/L	1000.0	03/10/2022	AB22-0310-07 AB22-0310-07
Sulfate	71700		-		03/10/2022	AB22-0310-07 AB22-0310-07
Sullate	71700	u	ıg/L	1000.0	03/10/2022	ADZZ-U31U-U/



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-53R
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-09
 Collect Time:
 01:09 PM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	Aliquot #: 22-0150-09-C03-A01		
Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking	
Total Dissolved Solids	709	mg/L	10.0	03/10/2022	AB22-0310-04	
Alkalinity by SM 2320B			Aliquot #: 22-0	150-09-C04-A01	Analyst: DLS	
Parameter(s)	Result	Flag Uni	ts RL	<b>Analysis Date</b>	Tracking	
Alkalinity Total	678000	ug/L	10000.0	03/15/2022	AB22-0315-11	
Alkalinity Bicarbonate	678000	ug/L	10000.0	03/15/2022	AB22-0315-11	
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11	



03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-54R
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0150-10
 Collect Time:
 07:05 AM

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	)150-10-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCF	R Rule Appendix III-IV To	tal Metals Exp	Aliquot #: 22-0	)150-10-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	1	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	154	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	4720	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	186000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	1	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	496	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	74	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	47300	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	108	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	7	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	2380	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	29600	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, CI, F,	SO4, Aqueous	Aliquot #: 22-0	)150-10-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Unit	•	Analysis Date	Tracking
Chloride	49800	ug/L	1000.0	03/10/2022	AB22-0311-03
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0311-03
Sulfate	67100	ug/L	1000.0	03/10/2022	AB22-0311-03



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0150**Collect Date: 03/09/2022

 Field Sample ID:
 MW-54R
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0150-10
 Collect Time:
 07:05 AM

Total Dissolved Solids by SM 2540C	Aliquot #: 22-0150-10-C03-A01		Analyst: CLH		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Total Dissolved Solids	776	mg/L	10.0	03/14/2022	AB22-0314-06
Alkalinity by SM 2320B			Aliquot #: 22-0	150-10-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	589000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	589000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-55
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-11
 Collect Time:
 09:43 AM

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	)150-11-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Unit	s RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-01
Metals by EPA 6020B: CCF	R Rule Appendix III-IV To	tal Metals Exp	Aliquot #: 22-0	)150-11-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	88	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	299	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	826	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	163000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	29800	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	28	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	32600	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	285	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	89	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	4	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	4100	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	1	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	107000	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, Cl, F,	SO4, Aqueous	Aliquot #: 22-0	)150-11-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Unit	•	Analysis Date	Tracking
Chloride	20200	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	35400	ug/L	1000.0	03/10/2022	AB22-0310-07



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 MW-55
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-11
 Collect Time:
 09:43 AM

Total Dissolved Solids by SM 2540C			Α	liquot #: 22-0	150-11-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag U	nits	RL	Analysis Date	Tracking
Total Dissolved Solids	808	mg.	/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Α	liquot #: 22-0	150-11-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag U	nits	RL	Analysis Date	Tracking
Alkalinity Total	735000	ug/	L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	735000	ug/	L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/	L	10000.0	03/15/2022	AB22-0315-11



03/24/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 OW-57R OUT
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0150-12
 Collect Time:
 08:31 AM

Mercury by EPA 7470A, Total, Aqueou	ıs			Aliquot #: 22-0	150-12-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2021	AB22-0315-02
Metals by EPA 6020B: CCR Rule Appe	endix III-IV To	tal Metal	s Exp	Aliquot #: 22-0	150-12-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	85		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	2030		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	126000		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	1		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	2		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	96		ug/L	20.0	03/15/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	26		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	72800		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	96		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	8		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	17		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	2410		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	1		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	59500		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Aniana by EDA 200 0 CCD Bula Analys	to Liet CLE	SO4 A ~:		All	450 40 000 404	A In ( - DANA/
Anions by EPA 300.0 CCR Rule Analys		-			150-12-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	62500		ug/L	1000.0	03/10/2022	AB22-0311-03
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0311-03
Sulfate	83100		ug/L	1000.0	03/10/2022	AB22-0311-03



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 OW-57R OUT
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0150-12
 Collect Time:
 08:31 AM

Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	150-12-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1030	m	ng/L	10.0	03/14/2022	AB22-0314-06
Alkalinity by SM 2320B				Aliquot #: 22-0	150-12-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	545000	u	g/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	545000	u	g/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	u	g/L	10000.0	03/15/2022	AB22-0315-11



03/24/22

22-0150

Report Date:



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project:

 Field Sample ID:
 MW-58
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-13
 Collect Time:
 02:06 PM

Mercury by EPA 7470A, Total, Aqueous			Aliquot #: 22-0	150-13-C01-A01	Analyst: CLH	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR	R Rule Appendix III-IV Tot	tal Metals	<b>Ехр</b>	Aliquot #: 22-0	150-13-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	2		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	98		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	154		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	102000		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	8740		ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	22		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	17000		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	279		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	15		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	4690		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	1		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	170000		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	3		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List. Cl. F. S	SO4. Agu	ieous	Aliguot #: 22-0	150-13-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	267000	3	ug/L	1000.0	03/11/2022	AB22-0310-07
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	8860		ug/L	1000.0	03/10/2022	AB22-0310-07
- *******	5555		~ <del>_</del>	.000.0		00.0 0.



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0150** 

Field Sample ID: **MW-58**Lab Sample ID: 22-0150-13

Collect Date: 03/07/2022 Collect Time: 02:06 PM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	150-13-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Total Dissolved Solids	803	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	)150-13-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Alkalinity Total	303000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	303000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 DUP-JCW-LF-01
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-14
 Collect Time:
 12:00 AM

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	)150-14-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCF	R Rule Appendix III-IV To	tal Metals Exp	Aliquot #: 22-0	)150-14-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units		Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	5	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	110	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1100	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	164000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	3170	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	30	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	67300	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	232	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	5	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	25	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	2410	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	3	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	66600	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List, CI, F,	SO4, Aqueous	Aliquot #: 22-0	)150-14-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	•	Analysis Date	Tracking
Chloride	60700	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	211000	ug/L	1000.0	03/11/2022	AB22-0310-07



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 DUP-JCW-LF-01
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-14
 Collect Time:
 12:00 AM

Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	150-14-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	934		mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B				Aliquot #: 22-0	150-14-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	539000		ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	539000		ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND		ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 DUP-JCW-LF-02
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-15
 Collect Time:
 12:00 AM

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	0150-15-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Uni	ts RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR	Rule Appendix III-IV To	al Metals Exp	Aliquot #: 22-0	)150-15-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	2	ug/L	1.0	03/15/2022	AB22-0316-08
Barium	117	ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Boron	1620	ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	185000	ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	1	ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND	ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Iron	1180	ug/L	20.0	03/16/2022	AB22-0316-08
Lead	ND	ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	77	ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	50900	ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	546	ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	6	ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	19	ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	10200	ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	2	ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND	ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	67600	ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND	ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND	ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List CLF	SOA Aguaque	Aliquet #: 22.4	0150-15-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Uni		Analysis Date	Tracking
Chloride	55600	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	330000	ug/L ug/L	1000.0	03/11/2022	AB22-0310-07 AB22-0310-07
Juliale	330000	ug/L	1000.0	03/11/2022	MDZZ-U3 IU-U/



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 DUP-JCW-LF-02
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0150-15
 Collect Time:
 12:00 AM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-	0150-15-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Uni	s RL	Analysis Date	Tracking
Total Dissolved Solids	1010	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-	0150-15-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Uni	s RL	Analysis Date	Tracking
Alkalinity Total	435000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	435000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11



03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18001 MS
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-16
 Collect Time:
 06:54 AM

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	)150-16-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	88.5	%	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR	R Rule Appendix III-IV To	tal Metals Exp	Aliquot #: 22-0	)150-16-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	110	%	1.0	03/15/2022	AB22-0316-08
Arsenic	101	%	1.0	03/15/2022	AB22-0316-08
Barium	79	%	5.0	03/15/2022	AB22-0316-08
Beryllium	98	%	1.0	03/15/2022	AB22-0316-08
Boron	119	%	20.0	03/16/2022	AB22-0316-08
Cadmium	106	%	0.2	03/15/2022	AB22-0316-08
Calcium	102	%	1000.0	03/16/2022	AB22-0316-08
Chromium	96	%	1.0	03/15/2022	AB22-0316-08
Cobalt	92	%	6.0	03/15/2022	AB22-0316-08
Copper	84	%	1.0	03/15/2022	AB22-0316-08
Iron	82	%	20.0	03/16/2022	AB22-0316-08
Lead	112	%	1.0	03/15/2022	AB22-0316-08
Lithium	94	%	10.0	03/15/2022	AB22-0316-08
Magnesium	120	%	1000.0	03/16/2022	AB22-0316-08
Manganese	109	%	5.0	03/16/2022	AB22-0316-08
Molybdenum	126	%	5.0	03/15/2022	AB22-0316-08
Nickel	108	%	2.0	03/15/2022	AB22-0316-08
Potassium	116	%	100.0	03/16/2022	AB22-0316-08
Selenium	91	%	1.0	03/15/2022	AB22-0316-08
Silver	95.8	%	0.2	03/15/2022	AB22-0316-08
Sodium	118	%	1000.0	03/16/2022	AB22-0316-08
Thallium	113	%	2.0	03/15/2022	AB22-0316-08
Vanadium	101	%	2.0	03/15/2022	AB22-0316-08
Zinc	84	%	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR	Rule Analyte List CLF	SUV Various	Aliquot #: 22.0	)150-16-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	•	Analysis Date	Tracking
Chloride	102	%	1000.0	03/11/2022	AB22-0310-07
Fluoride	91	%	1000.0	03/11/2022	AB22-0310-07 AB22-0310-07
Sulfate	99	% %			
Sullate	99	70	1000.0	03/11/2022	AB22-0310-07



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18001 MS
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-16
 Collect Time:
 06:54 AM

Alkalinity by SM 2320B		Al	iquot #: 22-0	150-16-C03-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	93.1	%	10000.0	03/15/2022	AB22-0315-11



03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 JCW-MW-18001 MSD
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0150-17
 Collect Time:
 06:54 AM

Mercury by EPA 7470A, Total, Aque	ous		Aliquot #: 22-0	150-17-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	83.0	%	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rule Ap	pendix III-IV To	tal Metals Exp	Aliquot #: 22-0	150-17-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	109	%	1.0	03/15/2022	AB22-0316-08
Arsenic	100	%	1.0	03/15/2022	AB22-0316-08
Barium	81	%	5.0	03/15/2022	AB22-0316-08
Beryllium	99	%	1.0	03/15/2022	AB22-0316-08
Boron	117	%	20.0	03/16/2022	AB22-0316-08
Cadmium	106	%	0.2	03/15/2022	AB22-0316-08
Calcium	102	%	1000.0	03/16/2022	AB22-0316-08
Chromium	92	%	1.0	03/15/2022	AB22-0316-08
Cobalt	90	%	6.0	03/15/2022	AB22-0316-08
Copper	83	%	1.0	03/15/2022	AB22-0316-08
Iron	79	%	20.0	03/16/2022	AB22-0316-08
Lead	112	%	1.0	03/15/2022	AB22-0316-08
Lithium	91	%	10.0	03/15/2022	AB22-0316-08
Magnesium	114	%	1000.0	03/16/2022	AB22-0316-08
Manganese	107	%	5.0	03/16/2022	AB22-0316-08
Molybdenum	128	%	5.0	03/15/2022	AB22-0316-08
Nickel	109	%	2.0	03/15/2022	AB22-0316-08
Potassium	116	%	100.0	03/16/2022	AB22-0316-08
Selenium	82	%	1.0	03/15/2022	AB22-0316-08
Silver	92.3	%	0.2	03/15/2022	AB22-0316-08
Sodium	114	%	1000.0	03/16/2022	AB22-0316-08
Thallium	115	%	2.0	03/15/2022	AB22-0316-08
Vanadium	101	%	2.0	03/15/2022	AB22-0316-08
Zinc	85	%	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR Rule Ana	luta List CLE	SO4 Aguaque	Alimum #. 22 (	)150-17-C02-A01	Analyst DMW
			<u> </u>		Analyst: DMW
Parameter(s)	Result	Flag Units		Analysis Date	Tracking
Chloride	104	%	1000.0	03/11/2022	AB22-0310-07
Fluoride	94	%	1000.0	03/10/2022	AB22-0310-07
Sulfate	103	%	1000.0	03/11/2022	AB22-0310-07



**Report Date:** 03/24/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0150**Collect Date: 03/07/2022

Field Sample ID: **JCW-MW-18001 MSD**Lab Sample ID: 22-0150-17

Collect Time: 06:54 AM

Alkalinity by SM 2320B			liquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	91.6	%	10000.0	03/15/2022	AB22-0315-11



03/24/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 FB-01
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0150-18
 Collect Time:
 08:45 AM

Matrix: Water

Mercury by EPA 7470A, Total, Aqueo	us			Aliquot #: 22-0	150-18-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rule App	endix III-IV T	otal Metals	s Exp	Aliquot #: 22-0	150-18-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	ND		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	ND		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	ND		ug/L	20.0	03/15/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	ND		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	ND		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	ND		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	ND		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Aniana by EDA 200 0 CCD Bula Analy	to liet CLE	: CO4 Am		All	450 40 000 404	A In ( - DAMA/
Anions by EPA 300.0 CCR Rule Analy		•			150-18-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND		ug/L	1000.0	03/10/2022	AB22-0311-03
Fluoride	ND		ug/L	1000.0	03/10/2022	AB22-0311-03
Sulfate	ND		ug/L	1000.0	03/10/2022	AB22-0311-03



03/24/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0150

 Field Sample ID:
 EB-01
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0150-19
 Collect Time:
 08:40 AM

Matrix: Water

Mercury by EPA 7470A, Total, Aqueou	ıs			Aliquot #: 22-0	150-19-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rule Appe	endix III-IV 1	Total Metals	Exp	Aliquot #: 22-0	150-19-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Arsenic	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Barium	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Beryllium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Boron	ND		ug/L	20.0	03/16/2022	AB22-0316-08
Cadmium	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Calcium	ND		ug/L	1000.0	03/16/2022	AB22-0316-08
Chromium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Cobalt	ND		ug/L	6.0	03/15/2022	AB22-0316-08
Copper	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Iron	ND		ug/L	20.0	03/15/2022	AB22-0316-08
Lead	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Lithium	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Magnesium	ND		ug/L	1000.0	03/16/2022	AB22-0316-08
Manganese	ND		ug/L	5.0	03/16/2022	AB22-0316-08
Molybdenum	ND		ug/L	5.0	03/15/2022	AB22-0316-08
Nickel	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Potassium	ND		ug/L	100.0	03/16/2022	AB22-0316-08
Selenium	ND		ug/L	1.0	03/15/2022	AB22-0316-08
Silver	ND		ug/L	0.2	03/15/2022	AB22-0316-08
Sodium	ND		ug/L	1000.0	03/16/2022	AB22-0316-08
Thallium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Vanadium	ND		ug/L	2.0	03/15/2022	AB22-0316-08
Zinc	ND		ug/L	10.0	03/15/2022	AB22-0316-08
Anions by EPA 300.0 CCR Rule Analy	telist Cl F	SO4 Aque	POLIS	Alignot #: 22-0	150-19-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	ND	_	ug/L	1000.0	03/10/2022	AB22-0311-03
Fluoride			-			
	ND		ug/L	1000.0	03/10/2022	AB22-0311-03
Sulfate	ND		ug/L	1000.0	03/10/2022	AB22-0311-03





**Report Date:** 03/24/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

## Chemistry Department

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

General Standard Operating Procedure

## TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

-					
Projec	t Log-In Number:	22-0150	-197-2-		
Inspec	tion Date:3-9. 2	2	Inspection By:	dmw	
Sampl	e Origin/Project Name:	Q1-2022 V	Jeadock Porch	ator Wells	
Shipm	ent Delivered By: Enter t	. /	rrier.		
			SUSPS_	Airl	orne
	Other/Hand Carry (whom		Tanana and		/
	Tracking Number: 210	63161 3031	_ Shipping Form A	ttached: Yes	_ No
Shippi	ng Containers: Enter the	type and number of sh	ipping containers received.		
	Cooler Car	dboard Box	Custom Case		
	Loose/Unpackaged Cont	ainers	Other		
Condi	tion of Shipment: Enter th	ne as-received condition	n of the shipment containe	r,	
	Damaged Shipment Obse	erved: None	Dented	Leal	king
	Other				
Shipm	ent Security: Enter if any	of the shipping contain	ners were opened before re	ceipt.	
	Shipping Containers Rec				
2.0				= 1	
Enclos	ed Documents: Enter the			Tarak .	
	CoC Work	Request	Air Data Sheet	Other	
Tempe	rature of Containers: Me	asure the temperature	of several sample contained	rs.	
	As-Received Temperatur	e Range 1.6-3.8	Samples Received o	n Ice: YesN	lo
	M&TE # and Expiration	N15402 6/3	3/22		
140				tionia.	
Numbe	er and Type of Container	7. 4			
	Container Type V	- 11	Other	Broken	Leaking
ptt paper		34 _		-	
	Quart/Liter (g/p) 9-oz (amber glass jar)	_			
0.0-14.0	2-oz (amber glass) _		-	-	-
Cat. NO.13-640-508	125 mL (plastic)	38		-	
	24 mL vial (glass)				
1ot: 222420	500 mL (plastic)				
EXP: 8.1.23	Other 251 M J	5			

CONSUMERS ENERGY

## Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

TITLE:	SAMPLE	LOG-IN-	SHIPMENT	INSPECTION FORM
		and the little and		

	200			
Project Log-In Number: ZZ.0	150			
Inspection Date: 3.10.23				
Sample Origin/Project Name: _ W	eadock -	Porewater 1	Wells	
Shipment Delivered By: Enter the typ	pe of shipment ca	rrier.		
Pony FedEx _	✓ UP	S U	SPS	Airborne
Other/Hand Carry (whom)				
Tracking Number: 2704		Shipping Fo	rm Attached: Yes	v No_
Shipping Containers: Enter the type				
				uslawa/Mailaw
Cooler/_ Cardboa  Loose/Unpackaged Container			Ell	velope/Mailer
Condition of Shipment: Enter the as-		AL PURE STREET, STREET	ntainer.	
Damaged Shipment Observed	: None	Dented_		Leaking
Other				
Shipping Containers Received  Enclosed Documents: Enter the type	of documents end	losed with the shipme	ent.	
CoC Work Request		Air Data Sheet	Other	
Temperature of Containers: Measure	the temperature	of several sample con	tainers.	
As-Received Temperature Ran	nge 2.4.5.1°C	Samples Recei	ved on Ice: Yes	No
M&TE # and Expiration 015	199 10-19	4-22		
Number and Type of Containers: En	iter the total num	per of sample contain	ers received.	
Container Type Water	r Soil	Other	Broke	<u>Leaking</u>
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 250 mc 2 Plastic	_			_



## CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMP	LING SITE / CU	ISTOMER:			PROJECT NUMBER:	SAP CC or WC	)#:							A	NAL	YSIS	REC	UEST	ED		21.050111001110011
Q1-20	22 Weadock P	orewater Wells			22-0150	REQUESTER:	Harc	old I	Regis	ter			(						Veeded)		QA REQUIREMENT:
SAMP	LING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ ST	ANDARD ⊠ OTF	HER_														□ NPDES ⊠ TNI
SENI	REPORT TO:	Caleb Batts			email:	phone:														I	□ ISO 17025
(	COPY TO:	Harold Regist	ter		MATRIX CODES:  GW = Groundwater OX = Other			C	ONT	AINE	RS									I	☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Sludg W = Water / Aqueous Liquid A = Air	e		I	RES	ERV	ATIV	Е	als							1	☐ INTERNAL INFO
	LAB	SAMPLE COLL	ECTION	XI	S = Soil / General Solid WP = Wipe O = Oil WT = Gene		AL#				-		Metals	ns		inity				I	□ OTHER
SA	MPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOTAL	None	HNO <sub>3</sub>	NaOH	HCI	Other	Total	Anions	TDS	Alkalinity					REMARKS
2	22-0150-01	3/7/21	biggy	GW	JCW-MW-18001		5	4	1				x	x	x	x					
	-02	3/7/2	0757	GW	JCW-MW-18004		5	4	1				x	x	x	x					
	-03	3/7/00	1220	GW	JCW-MW-18005		5	4	1				x	x	x	x					
	-04	3/7/27	13/2	GW	JCW-MW-18006		5	4	1				x	x	x	x					
	-05	3/4/25	いつろて	GW	MW-50		5	4	1				x	x	x	x					
	-06	3/8/22	משט	GW	MW-51		5	4	1				x	x	x	x					
	-07	3/8/00	6900	GW	MW-52		5	4	1				x	x	x	x					
	-08	3/8/35	0935	GW	MW-53		5	4	1				x	x	x	х					
	-09	3/8/20	1369	GW	MW-53R		5	4	1				x	x	x	x					
2 - y	-10			GW	MW-54R		5	4	1				x	x	x	x					
100	-11	3/7/21	0943	GW	MW-55		5	4	1				x	x	x	x					
1 8	-12			GW	OW-57R OUT		5	4	1				x	x	x	x					
	IQUISHED BY:	9		DATE/	3/20 14ce	Fed 5K								MME			Yes	□ No	M&	TE#:_	015402 rate: 6-3-22
	Fed	- GX		03-0	7-2022 11:30	2-0150 Page 44 of	47						Ten	npera	ture:	1-6	3.8	°C	Cal.	Due D	ate: 6-3-22



## CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAM	IPLING SITE / CU	JSTOMER:			PROJECT NUMBER:	SAP CC or W	O#:											JESTE		QA REQUIREMENT:
Q1-	2022 Weadock F	Porewater Wells			22-0150	REQUESTER	: Haro	old I	Regi	ster				(Attac	ch Lis	t if M	ore Space	e is Ne	eded)	QA REQUIREMENT.
SAM	IPLING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ S	TANDARD ⊠ OT	HER_													□ NPDES  ⊠ TNI
SEN	ND REPORT TO:	Caleb Batts			email:	phone:														□ ISO 17025
	COPY TO:	Harold Registe	er		MATRIX CODES: GW = Groundwater OX = Oth	er		C	ONT	AIN	ERS									☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Sluc W = Water / Aqueous Liquid A = Air				PRES	SERV	ATI	VE	Metals							☐ INTERNAL INFO
	LAB	SAMPLE COL	LECTION	XIX	S = Soil / General Solid WP = Wi	ipe eneral Waste	TOTAL #		_	7 1			1 Me	suc		Alkalinity				□ OTHER
S	SAMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	OCATION	TOT	None	HNO	H <sub>2</sub> SO NaOF	HCI	MeOH	Total	Anions	TDS	Alka				REMARKS
	22-0150-13	3/7/22	1406	GW	MW-58		5	4	1				х	x	x	x				
	-14	3/7/2	-	GW	DUP-JCW-LF-01		5	4	1				х	x	x	x				
	-15	3/8/2		GW	DUP-JCW-LF-01		5	4	1				х	x	x	x				
	-16	3/7/22	0654	GW	JCW-MW-18001 MS		4	3	1				x	х		x				
	-17	3/7/33	0654	GW	JCW-MW-18001 MSD		4	3	1				x	х		х				
	-18			W	FB-01		2	1	1				х	х						
	-19			W	EB-01		2	1	1			Н	х	х						
				_																
										4		Ш								
								H				H	-							
DEL	INOUISHED BY:			DATE	TIME:	RECEIVED BY:			Ш		Ц		000	MMI	TKITE					
(	INQUISHED BY:		3/8/	5		RECEIVED BY:							16.2				Yes D	7 No	M&TE	# 015402
KEL	1/	l ex	03_		22 11130	22-0150 Page 45 o	f 47						1,400				3.8		Cal. Di	#: 015402 ue Date: 6-3-22



## CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

	PLING SITE / CU				PROJECT NUMBER:	SAP CC or WO		1 3/2					1	A	NAL	YSIS	REC	UES'	ΓED Needed)		QA REQUIREMENT:
	022 Weadock P	orewater Wells	5		22-0150	REQUESTER:	Haro	ld R	legis	ter			- 13	Attac	in Lis	I II IV	iore Sp	ace is	Needed)		
SAMI	PLING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ STA	ANDARD ⊠ OTI	HER _					4									□ NPDES  □ TNI
SEN	D REPORT TO:	Caleb Batts			email:	phone:															☐ ISO 17025
	COPY TO:	Harold Regist	er		MATRIX CODES: GW = Groundwater OX = Other			CC	NTA	INE	RS										☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Sludge W = Water / Aqueous Liquid A = Air			P	RES	ERV	ATIV	VΕ	als								☐ INTERNAL INFO
	LAB	SAMPLE COL	LECTION	XIX	S = Soil / General Solid   WP = Wipe   O = Oil   WT = Gene		TOTAL#			-			Il Metals	suc	Ш	Alkalinity					□ OTHER
Sa	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LOG	CATION	ТОТ	None	ONH	NaOH	HCI	Other	Total	Anions	TDS	Alka					REMARKS
	22-0150-13			GW	MW-58		5	4	1				x	x	x	x					F - 3 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5
	-14			GW	DUP-JCW-LF-01		5	4	1				x	x	x	x					
	-15			GW	DUP-JCW-LF-01		5	4	1				x	x	x	х					
	-16			GW	JCW-MW-18001 MS		4	3	î				x	x		x.					
	-17			GW	JCW-MW-18001 MSD		4	3	1				x	x		x					
	-18	3/9/33	0845	w	FB-01		2	1	1				x	x							
	-19	3/9/07	oère	w	EB-01		2	1	1				x	x							
												H	Ш								
			11.4																		
															Ħ						
												T									
RELI	NQUISHED BY:	1		1		ECEIVED BY:				120			CO	MMI	ENTS	:					
RELI	NQUISHED BY:	/	÷×	BATE	TIME: R	ECEIVED BY:							1000				Yes 5.1		) M&	&TE#	Date: 6-3-22
KLDII	Constitution	/		0.000	-10-22 11:30	2-0150 Page 46 o	f 47						1000						Cal	l. Due	Date: 6-3-20



## CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

	PLING SITE / CU				PROJECT NUMBER:	SAP CC or WO								A	NAL	YSIS	REQ	UEST	ED		QA REQUIREMENT:
182	022 Weadock P	orewater Wells			22-0150	REQUESTER:	Haro	old F	Regis	ster				Atta	en Las	III M	ore Spa	ace is i	Veeded)		Action with a series
SAM	PLING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ ST	ANDARD ⊠ OTI	HER_													- 0	□ NPDES  □ TNI
SEN	D REPORT TO:	Caleb Batts			email:	phone:															☐ ISO 17025
	COPY TO:	Harold Regis	ster		MATRIX CODES; GW = Groundwater OX = Other			CC	ONT	AIN	ERS										☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Sludg W = Water / Aqueous Liquid A = Air	e		I	RES	ERV	AT	VE	als								☐ INTERNAL INFO
	LAB	SAMPLE COL	LECTION	XIX	S = Soil / General Solid   WP = Wipo   O = Oil   WT = General Solid   WT = General Solid		AL#			4		_	Metals	suc		linity					□ OTHER
S	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOTAL	None	HNO3	NaOH	HCI	MeOH	Total 1	Anions	TDS	Alkalinity					REMARKS
1 3	22-0150-01			GW	JCW-MW-18001		5	4	1				x	x	x	x					
HET	-02			GW	JCW-MW-18004		5	4	1				x	x	x	x					
	-03			GW	JCW-MW-18005		5	4	1				х	x	x	x					
	-04			GW	JCW-MW-18006		5	4	1	T		П	x	x	x	x					
	-05			GW	MW-50		5	4	1				x	x	x	x					
	-06			GW	MW-51		5	4	1				x	x	x	x					
	-07			GW	MW-52		5	4	1		1		x	x	x	x					
	-08			GW	MW-53		5	4	1				x	x	x	x					
	-09			GW	MW-53R		5	4	1		П		x	x	x	x					
	-10	3/9/20	070-	GW	MW-54R		5	4	1				x	x	x	x					
	-11	111100	Urc	GW	MW-55		5	4	1	t	Ħ		x	x	x	x					
	-12	3/9/22	0831	GW	OW-57R OUT		5	4	1	T	Г	H	x	x	x	х					
BELL	NQUISHED BY:	1711100		DATE/	TIME:	RECEIVED BY:	_			-		-	CC	MMI	ENTS	:					
			2/	913:	143C R	ed Ex															
RELI	NQUISHED BY:		),	DATE/		RECEIVED BY:						7	Re	ceive	on I	ce?	Yes	□ No			015402
		Fed EX	0	3-10	-2022 11:30	X-							Ter	npera	ture:	1.6-	3.8	°C	Cal	Due I	Date: 6-3-2L
						22-0150 Page 47 o	f 47														



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: April 01, 2022

Subject: HMP GROUNDWATER MONITORING – LABORATORY LEACHATE – 2022

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0154

Four fly ash samples were collected on 03/01/2022 from the DE Karn Unit 1 and Unit 2, for the annual laboratory leachate requirement, as specified in the Hydrogeological Monitoring Plan for the site. The samples were received for SPLP analysis by the Chemistry Department of Laboratory Services on 03/01/2022.

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. Please note that the SPLP extraction is not included in the scope of accreditation, only the individual analytes tested. 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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate.

The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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.

#### 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, 22<sup>nd</sup> Edition, 2012.

#### III. Results/Quality Control

Analytical results in this report are presented by laboratory sample ID, container, and aliquot number. Results for the field blanks, field duplicate and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section. 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 used 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.

NOTE: Sodium and Boron were found in the SPLP Extraction Blank. Both analytes are common in the glass fiber filters used in the preparatory extraction. Sodium measured 1210 ug/L and Boron measured 133 ug/L; all samples have been flagged (X) to indicate the potential bias.

### **DEFINITIONS / QUALIFIERS**

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

<u>Acronym</u>	<u>Description</u>
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

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



## **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q1-2022 DEK HMP Fly Ash Laboratory Leachate

**Date Received:** 3/01/2022 **Chemistry Project:** 22-0154

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0154-01	Fly Ash #1 - Unit 1 Sample 1	Fly Ash	03/01/2022 09:30 AM	DEK Solid Waste Disposal Area
22-0154-02	Fly Ash #2 - Unit 1 Sample 2	Fly Ash	03/01/2022 09:30 AM	DEK Solid Waste Disposal Area
22-0154-03	Fly Ash #3 - Unit 2 Sample 1	Fly Ash	03/01/2022 09:35 AM	DEK Solid Waste Disposal Area
22-0154-04	Fly Ash #4 - Unit 2 Sample 2	Fly Ash	03/01/2022 09:35 AM	DEK Solid Waste Disposal Area



Report Date:

04/01/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK Solid Waste Disposal Area (392503)** Laboratory Project: 22-0154

Field Sample ID: Fly Ash #1 - Unit 1 Sample 1

Lab Sample ID: Matrix:

Collect Date: 03/01/2022 22-0154-01 Collect Time: 09:30 AM Leachate

SPLP Extraction by EPA 1312				Aliquot #: 22-0	154-01-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Extraction	complete				03/09/2022	AB22-0308-07
SPLP Phosphorus by EPA 1312 / SM 4	500-P; B5-E			Aliquot #: 22-0	154-01-C01-A02	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Phosphorus	ND		ug/L	10.0	03/14/2022	AB22-0314-11
SPLP Mercury by EPA 1312 / 7470A				Aliquot #: 22-0	154-01-C01-A03	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
SPLP Sulfate by EPA 300.0				Aliquot #: 22-0	154-01-C01-A04	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfate	420000		ug/L	1000.0	03/15/2022	AB22-0315-06
SPLP Alkalinity Bicarbonate by EPA 1	312 / SM 2320	В		Aliquot #: 22-0	154-01-C01-A05	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Alkalinity, Bicarbonate	ND		ug/L	10000.0	03/18/2022	AB22-0317-01
SPLP Laboratory Leachate Metals by I	EPA 1312/602	0A		Aliguot #: 22-0	154-01-C01-A06	Analyst: EB
SPLP Laboratory Leachate Metals by I	EPA 1312/602	0A Flag	Units	Aliquot #: 22-0	154-01-C01-A06 Analysis Date	Analyst: EB
Parameter(s)	Result			RL	Analysis Date	Tracking
			ug/L	<b>RL</b> 1.0	Analysis Date 03/18/2022	Tracking AB22-0318-05
Parameter(s) Antimony Arsenic	Result ND 1		ug/L ug/L	RL 1.0 1.0	Analysis Date 03/18/2022 03/18/2022	Tracking AB22-0318-05 AB22-0318-05
Parameter(s)  Antimony Arsenic Barium	Result ND 1 420		ug/L ug/L ug/L	RL 1.0 1.0 5.0	Analysis Date 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s) Antimony Arsenic	Result ND 1		ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0	Analysis Date 03/18/2022 03/18/2022	Tracking AB22-0318-05 AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium	Result ND 1 420 ND	Flag	ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron	Result ND 1 420 ND 170	Flag	ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium	Result ND 1 420 ND 170 ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt	Result ND 1 420 ND 170 ND 99	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium	Result  ND 1 420  ND 170  ND 99  ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper	Result ND 1 420 ND 170 ND 99 ND 3	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron	Result  ND  1  420  ND  170  ND  99  ND  3  27	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead	Result  ND  1  420  ND  170  ND  99  ND  3  27  ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium	Result  ND  1  420  ND  170  ND  99  ND  3  27  ND  12	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  1.0  1.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum	Result  ND  1  420  ND  170  ND  99  ND  3  27  ND  12  100	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel	Result  ND  1  420  ND  170  ND  99  ND  3  27  ND  12  100  12	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0  2.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel Selenium	Result  ND  1  420  ND  170  ND  99  ND  3  27  ND  12  100  12  49	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0  2.0  1.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05



**Report Date:** 04/01/22

03/01/2022

09:30 AM

Collect Date:

Collect Time:

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: DEK Solid Waste Disposal Area (392503) Laboratory Project: 22-0154

Field Sample ID: Fly Ash #1 - Unit 1 Sample 1

Lab Sample ID: 22-0154-01

Matrix: Leachate

SPLP Laboratory Leachate Me	etals by EPA 1312/602	0A	Aliquot #: 22-	0154-01-C01-A06	Analyst: EB
Parameter(s)	Result	Flag Units	RL	<b>Analysis Date</b>	Tracking
Thallium	ND	ug/L	2.0	03/18/2022	AB22-0318-05
Vanadium	39	ug/L	2.0	03/18/2022	AB22-0318-05
Zinc	ND	ug/L	10.0	03/18/2022	AB22-0318-05





## **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: DEK Solid Waste Disposal Area (392503) Laboratory Project: 22-0154

Field Sample ID: Fly Ash #2 - Unit 1 Sample 2

Lab Sample ID: 22-0154-02 Matrix: Leachate Collect Date: 03/01/2022 Collect Time: 09:30 AM

Report Date:

04/01/22

SPLP Extraction by EPA 1312				Aliquot #: 22-0		Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Extraction	complete				03/09/2022	AB22-0308-07
SPLP Phosphorus by EPA 1312 / SM 4	500-P; B5-E			Aliquot #: 22-0	154-02-C01-A02	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Phosphorus	ND		ug/L	10.0	03/14/2022	AB22-0314-11
SPLP Mercury by EPA 1312 / 7470A				Aliquot #: 22-0	154-02-C01-A03	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
SPLP Sulfate by EPA 300.0				Aliquot #: 22-0	154-02-C01-A04	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfate	253000		ug/L	1000.0	03/15/2022	AB22-0315-06
SPLP Alkalinity Bicarbonate by EPA 1	312 / SM 2320	В		Aliquot #: 22-0	154-02-C01-A05	Analyst: DLS
•			l Inito	RL		Tracking
rarameter(s)	Result	Flag	Units	INL	Analysis Date	Hacking
Parameter(s)  SPLP Alkalinity, Bicarbonate	<b>Result</b> ND	Flag	ug/L	10000.0	03/18/2022	AB22-0317-01
SPLP Alkalinity, Bicarbonate	ND			10000.0	03/18/2022	AB22-0317-01
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I	ND	0A	ug/L	10000.0  Aliquot #: 22-0	03/18/2022 154-02-C01-A06	AB22-0317-01  Analyst: EB
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)	ND <b>EPA 1312/602</b> <b>Result</b>		ug/L Units	10000.0  Aliquot #: 22-0	03/18/2022 154-02-C01-A06 Analysis Date	AB22-0317-01  Analyst: EB  Tracking
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony	ND EPA 1312/6020 Result ND	0A	ug/L Units ug/L	10000.0  Aliquot #: 22-0  RL  1.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic	ND EPA 1312/6020 Result ND 1	0A	ug/L Units ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium	ND EPA 1312/6020 Result ND 1 1900	0A	ug/L Units ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony  Arsenic  Barium  Beryllium	ND  EPA 1312/6020  Result  ND  1  1900  ND	0A Flag	ug/L Units ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony  Arsenic  Barium  Beryllium  Boron	ND  EPA 1312/6020  Result  ND  1  1900  ND  94	0A	ug/L Units ug/L ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony  Arsenic  Barium  Beryllium  Boron  Cadmium	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND	0A Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120	0A Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by Berameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND	0A Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND  ND	0A Flag	ug/L  Units  ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0	03/18/2022 154-02-C01-A06 Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND  ND  ND  29	0A Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead	ND EPA 1312/6020 Result ND 1 1900 ND 94 ND 120 ND ND ND 29 ND	0A Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Chromium Cobalt Copper Iron Lead Lithium	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND  ND  29  ND  29  ND  21	0A Flag	ug/L  Units  ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  1.0  1.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by Berameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum	ND EPA 1312/6020 Result ND 1 1900 ND 94 ND 120 ND ND 120 ND 29 ND 21 110	0A Flag	ug/L  Units  ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by Interpretation of the second	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND  ND  29  ND  21  110  9	0A Flag	ug/L  Units  ug/L	10000.0  Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 10.0 5.0 2.0 2.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel Selenium	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND  ND  29  ND  21  110  9  41	0A Flag	ug/L  Units  ug/L  ug/L	10000.0  Aliquot #: 22-0  RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0  2.0  1.0  10.0  5.0  2.0  1.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05  AB22-0318-05
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel	ND  EPA 1312/6020  Result  ND  1  1900  ND  94  ND  120  ND  ND  29  ND  21  110  9	0A Flag	ug/L  Units  ug/L	10000.0  Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 10.0 5.0 2.0 2.0	03/18/2022  154-02-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	AB22-0317-01  Analyst: EB  Tracking  AB22-0318-05



**Report Date:** 04/01/22

03/01/2022

09:30 AM

Collect Date:

Collect Time:

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: DEK Solid Waste Disposal Area (392503) Laboratory Project: 22-0154

Field Sample ID: Fly Ash #2 - Unit 1 Sample 2

Lab Sample ID: 22-0154-02

Matrix: Leachate

SPLP Laboratory Leachate Met	als by EPA 1312/602	20A	Aliquot #: 22-0	0154-02-C01-A06	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Thallium	ND	ug/L	2.0	03/18/2022	AB22-0318-05
Vanadium	69	ug/L	2.0	03/18/2022	AB22-0318-05
Zinc	ND	ug/L	10.0	03/18/2022	AB22-0318-05



Report Date:

Collect Date:

Collect Time:

04/01/22

03/01/2022

09:35 AM



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK Solid Waste Disposal Area (392503)** Laboratory Project: **22-0154** 

Field Sample ID: Fly Ash #3 - Unit 2 Sample 1

Lab Sample ID: 22-0154-03

Matrix: Leachate

SPLP Extraction by EPA 1312				Aliquot #: 22-0	154-03-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Extraction	complete				03/09/2022	AB22-0308-07
SPLP Phosphorus by EPA 1312 / SM 4	500-P; B5-E			Aliquot #: 22-0	154-03-C01-A02	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Phosphorus	ND		ug/L	10.0	03/14/2022	AB22-0314-11
SPLP Mercury by EPA 1312 / 7470A				Aliquot #: 22-0	154-03-C01-A03	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
SPLP Sulfate by EPA 300.0				Aliquot #: 22-0	154-03-C01-A04	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfate	309000		ug/L	1000.0	03/15/2022	AB22-0315-06
SPLP Alkalinity Bicarbonate by EPA 1	312 / SM 2320	В		Aliquot #: 22-0	154-03-C01-A05	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Alkalinity, Bicarbonate	ND		ug/L	10000.0	03/18/2022	AB22-0317-01
SPLP Laboratory Leachate Metals by I	EPA 1312/6020	0A		Aliquot #: 22-0	154-03-C01-A06	Analyst: EB
SPLP Laboratory Leachate Metals by I	EPA 1312/6020 Result	DA Flag	Units	Aliquot #: 22-0	154-03-C01-A06 Analysis Date	Analyst: EB Tracking
			Units ug/L	-		
Parameter(s)	Result			RL	Analysis Date	Tracking
Parameter(s) Antimony	<b>Result</b> ND		ug/L	<b>RL</b> 1.0	Analysis Date 03/18/2022	Tracking AB22-0318-05
Parameter(s) Antimony Arsenic	Result ND 1		ug/L ug/L	RL 1.0 1.0	Analysis Date 03/18/2022 03/18/2022	Tracking AB22-0318-05 AB22-0318-05
Parameter(s)  Antimony Arsenic Barium	Result ND 1 1600		ug/L ug/L ug/L	RL 1.0 1.0 5.0	Analysis Date 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium	Result ND 1 1600 ND	Flag	ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0	Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron	Result ND 1 1600 ND 180	Flag	ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium	Result ND 1 1600 ND 180 ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium	Result ND 1 1600 ND 180 ND 87	Flag	ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt	Result  ND 1 1600  ND 180  ND 87  ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0	Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper	Result ND 1 1600 ND 180 ND 87 ND ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron	Result  ND  1  1600  ND  180  ND  87  ND  ND  ND  26	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead	Result  ND  1  1600  ND  180  ND  87  ND  ND  26  ND	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium	Result  ND  1  1600  ND  180  ND  87  ND  ND  26  ND  21	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum	Result  ND  1  1600  ND  180  ND  87  ND  ND  26  ND  21  160  9	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0  2.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel	Result  ND  1  1600  ND  180  ND  87  ND  ND  26  ND  21  160	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0  2.0  1.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05
Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel Selenium	Result  ND  1  1600  ND  180  ND  87  ND  ND  26  ND  21  160  9  49	Flag	ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L	RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0  20.0  1.0  10.0  5.0  2.0	Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Tracking  AB22-0318-05  AB22-0318-05



Report Date: 04/01/22

03/01/2022

Collect Date:

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK Solid Waste Disposal Area (392503)** Laboratory Project: 22-0154

Field Sample ID: Fly Ash #3 - Unit 2 Sample 1

Lab Sample ID: 22-0154-03

Collect Time: 09:35 AM Matrix: Leachate

SPLP Laboratory Leachate M	20A	Aliquot #: 22-0	0154-03-C01-A06	Analyst: EB	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Thallium	ND	ug/L	2.0	03/18/2022	AB22-0318-05
Vanadium	39	ug/L	2.0	03/18/2022	AB22-0318-05
Zinc	ND	ug/L	10.0	03/18/2022	AB22-0318-05



04/01/22

22-0154

03/01/2022

09:35 AM

Report Date:

Collect Date:

Collect Time:



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK Solid Waste Disposal Area (392503)** Laboratory Project:

Field Sample ID: Fly Ash #4 - Unit 2 Sample 2

Lab Sample ID: 22-0154-04

Matrix: Leachate

SPLP Extraction by EPA 1312				Aliquot #: 22-0	154-04-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Extraction	complete				03/09/2022	AB22-0308-07
SPLP Phosphorus by EPA 1312 / SM 4	500-P; B5-E			Aliquot #: 22-0	154-04-C01-A02	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Phosphorus	ND		ug/L	10.0	03/14/2022	AB22-0314-11
SPLP Mercury by EPA 1312 / 7470A				Aliquot #: 22-0	154-04-C01-A03	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
SPLP Sulfate by EPA 300.0				Aliquot #: 22-0	154-04-C01-A04	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfate	291000		ug/L	1000.0	03/15/2022	AB22-0315-06
SPLP Alkalinity Bicarbonate by EPA 1	312 / SM 2320	В		Aliquot #: 22-0	154-04-C01-A05	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
SPLP Alkalinity, Bicarbonate	ND		ug/L	10000.0	03/18/2022	AB22-0317-01
· ·		DA.	ug/L			
SPLP Alkalinity, Bicarbonate  SPLP Laboratory Leachate Metals by I  Parameter(s)		DA Flag	ug/L Units		03/18/2022 154-04-C01-A06 Analysis Date	
SPLP Laboratory Leachate Metals by I	EPA 1312/6020			Aliquot #: 22-0	154-04-C01-A06	Analyst: EB
SPLP Laboratory Leachate Metals by I	EPA 1312/6020 Result		Units	Aliquot #: 22-0 RL	154-04-C01-A06 Analysis Date	Analyst: EB Tracking
SPLP Laboratory Leachate Metals by I Parameter(s) Antimony	EPA 1312/6020 Result		Units ug/L ug/L	Aliquot #: 22-0 RL 1.0	154-04-C01-A06 Analysis Date 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s) Antimony Arsenic	EPA 1312/6020 Result ND 1		Units ug/L ug/L ug/L	Aliquot #: 22-0 RL 1.0 1.0	154-04-C01-A06 Analysis Date 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium	EPA 1312/6020 Result ND 1 2600		Units ug/L ug/L ug/L ug/L	Aliquot #: 22-0 RL 1.0 1.0 5.0 1.0	154-04-C01-A06  Analysis Date  03/18/2022  03/18/2022  03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05 AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium	EPA 1312/6020 Result ND 1 2600 ND	Flag	Units ug/L ug/L ug/L ug/L ug/L	Aliquot #: 22-0 RL 1.0 1.0 5.0 1.0 20.0	154-04-C01-A06  Analysis Date 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s) Antimony Arsenic Barium Beryllium Boron	Result  ND  1  2600  ND  150  ND	Flag	Units  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L	Aliquot #: 22-0 RL 1.0 1.0 5.0 1.0 20.0 0.2	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium	Result  ND  1  2600  ND  150  ND  100	Flag	Units  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L	Aliquot #: 22-0 RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0	154-04-C01-A06  Analysis Date  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022  03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt	Result  ND  1  2600  ND  150  ND  100  ND	Flag	Units  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L  ug/L	Aliquot #: 22-0 RL 1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper	Result  ND  1  2600  ND  150  ND  100  ND  ND	Flag	Units  ug/L	Aliquot #: 22-0 RL  1.0  1.0  5.0  1.0  20.0  0.2  1.0  6.0  2.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron	Result  ND  1  2600  ND  150  ND  100  ND  ND  33	Flag	Units  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead	Result  ND  1  2600  ND  150  ND  100  ND  ND  100  ND  ND  ND  ND  ND  ND  ND  ND  ND	Flag	Units  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium	Result  ND  1  2600  ND  150  ND  100  ND  ND  33  ND  21	Flag	Units  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 1.0 1.0 1.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Chromium Cobalt Copper Iron Lead Lithium Molybdenum	Result  ND  1  2600  ND  150  ND  100  ND  100  ND  21  21  200	Flag	Units  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 10.0 5.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking  AB22-0318-05
SPLP Laboratory Leachate Metals by I Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel	Result  ND  1  2600  ND  150  ND  100  ND  ND  33  ND  21  200  8	Flag	Units  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 10.0 5.0 2.0 20.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel Selenium	Result  ND  1  2600  ND  150  ND  100  ND  100  ND  21  200  8  54	Flag	Units  ug/L  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 10.0 5.0 2.0 1.0 11.0 11.0 11.0 11.0 11.0 11.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05
SPLP Laboratory Leachate Metals by I  Parameter(s)  Antimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Copper Iron Lead Lithium Molybdenum Nickel	Result  ND  1  2600  ND  150  ND  100  ND  ND  33  ND  21  200  8	Flag	Units  ug/L	Aliquot #: 22-0  RL  1.0 1.0 5.0 1.0 20.0 0.2 1.0 6.0 2.0 20.0 1.0 10.0 5.0 2.0 20.0	154-04-C01-A06  Analysis Date  03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022 03/18/2022	Analyst: EB Tracking AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05 AB22-0318-05



Report Date: 04/01/22

**Laboratory Services** A CENTURY OF EXCELLENCE

Sample Site: **DEK Solid Waste Disposal Area (392503)** Laboratory Project: 22-0154

Field Sample ID: Fly Ash #4 - Unit 2 Sample 2

Collect Date: 03/01/2022 Lab Sample ID: 22-0154-04 Collect Time: 09:35 AM

Matrix: Leachate

SPLP Laboratory Leachate Meta	20A	Aliquot #: 22-	Analyst: EB		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Thallium	ND	ug/L	2.0	03/18/2022	AB22-0318-05
Vanadium	41	ug/L	2.0	03/18/2022	AB22-0318-05
Zinc	ND	ug/L	10.0	03/18/2022	AB22-0318-05





**Report Date:** 04/01/22

Data Qualifiers	Exception Summary
X = Sodium and Boron found in the SPLP Extraction Blank.	No other exceptions occured.

CONSUMERS ENERGY

## Chemistry Department

General Standard Operating Procedure

PROC CHEM-1,2,01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

## TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Aur.		22-01			EB	
-	ection Date:03			Inspection By:		
Sam	ple Origin/Project Na	me: (Ca	m Fly A	el for SPLP		
Ship	ment Delivered By: E	Enter the type of	f shipment car	rier.		
	Pony	FedEx	UPS	S US	PS Ai	rborne
	Other/Hand Carry					
	Tracking Number:			Shipping For	m Attached: Yes	No
Ship	oing Containers: Ente	er the type and	number of shi	pping containers recei	ived	
	Cooler /			Custom Case		/\ (!\
	2000-10					pe/Mailer
					A .	
Cond	lition of Shipment: E	nter the as-rece	ived condition	of the shipment cont	ainer.	
	Damaged Shipmen	it Observed: No	one	Dented	Les	aking
	Other					
Ship	ment Security: Enter	if any of the shi	ipping contain	ers were opened before	re receipt.	
	Shipping Container	rs Received: Or	nened N to		V 2 2 2	
				SealedI	414	
Enclo	sed Documents: Ente	er the type of do	ocuments encl	Sealed	1 (A	
Enclo	sed Documents: Ente	er the type of do	ocuments encl	SealedI	1 (A	
	sed Documents: Ente	er the type of do	ocuments encl	Sealed	N (A other	
	CoC	er the type of do Work Request _ rs: Measure the	ocuments encl	Sealed osed with the shipmer Air Data Sheet of several sample conta	N (A other o	No. V
	CoC Container  As-Received Temp	er the type of do Work Request _ rs: Measure the perature Range_	temperature o	Sealed osed with the shipmer Air Data Sheet of several sample conta	N (A other o	No_ ✓
	CoC	er the type of do Work Request _ rs: Measure the perature Range_	temperature o	Sealed osed with the shipmer Air Data Sheet of several sample conta	N (A other o	No
Гетј	CoC Container  As-Received Temp	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample conta Samples Receive 3-22	Other ainers. ed on Ice: Yes	No
Гетј	CoC verature of Container  As-Received Temp  M&TE # and Expir	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature o	Sealed losed with the shipmer Air Data Sheet of several sample conta Samples Receive 3-22	Other ainers. ed on Ice: Yes	
Гетј	coccontents: Enter  CoC  Derature of Container  As-Received Temp  M&TE # and Expire  Der and Type of Container	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	
Гетј	core and Type of Container  Container  Container  Container  Container  Container Type	work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	
Гетј	osed Documents: Enter CoC	work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	No
Гетј	coccuments: Enter CoC verature of Container  As-Received Temp  M&TE # and Expirement Type of Container Type  VOA (40mL or 60m)  Quart Liter (200)	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	
Гетј	coc verature of Container As-Received Temp M&TE # and Expir oer and Type of Container Type VOA (40mL or 60m) Quart Liter (200) 9-oz (amber glass ja	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	
Гетј	osed Documents: Enter CoC	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	
Гетј	osed Documents: Enter CoC	er the type of do Work Request _ rs: Measure the perature Range_ ration	temperature of 17.3° C	Sealed losed with the shipmer Air Data Sheet of several sample container Samples Receive 3-22 er of sample container	Other ainers. ed on Ice: Yes	



### CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 1 of 1

SAMPLING SITE / CU			LAB PROJECT NUMBER: SAP CC or WO#:				ANALYSIS REQUESTED			)	OA BEOLUBEMENT								
DEKarn - Fly A	sh Laborator	ry Leach	ate	22-0154	22-0154 REQUESTER: Harold Register				(Attach List if More Space is Needed)				QA REQUIREMENT:						
SAMPLING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ STANDARD ☑ OTHER 10 days  email: phone:				List						☐ NPDES ☑ TNI					
SEND REPORT TO:	Calek	Batts														☐ ISO 17025			
COPY TO:	Harold	Register		MATRIX CODES:  GW = Groundwater OX = Oth	Fly Ash		CO	NTA	INE	RS		Leachate							☐ 10 CFR 50 APP. B
	Т	RC		WW = Wastewater SL = Slud W = Water / Aqueous Liquid A = Air			P	RES	ERV	VIT	Е								☐ INTERNAL INFO
LAB	SAMPLE COLL	ECTION	MATRIX	S = Soil / General Solid WP = Wi	ipe neral Waste	TOTAL#		5 6	H	H		Laboratory							□ OTHER
SAMPLE ID	DATE	TIME	MA	FIELD SAMPLE ID / LO	OCATION	70.	Non	HNC	NaOH	Med	Othe	Lab							REMARKS
22-0154-01	03-01-22	0830	ох	Fly Ash #1 - Unit 1 San	nple 1	1	1					1							4:
22-0154-02		1030	ox	Fly Ash #2 - Unit 1 Sar	mple 2	1	1					1							
22-0154-03		0835	ox	Fly Ash #3 - Unit 2 Sar	mple 1	1	1					1							
22-0154-04	7	1035	ох	Fly Ash #4 - Unit 2 Sample 2		1	1		$\parallel$	1		1							
										1									
										1					t				
RELINQUISHED BY:				/TIME: 2 /275 <u></u>	RECEIVED BY:	3						co	MME	NTS:					
RELDIQUISHED BY:			DATE	/TIME:	RECEIVED BY:										Y.				#: 065402 Due Date: 6-3-22



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: March 24, 2022

Subject: PART 115 GROUNDWATER MONITORING – JCW LEACHATE WELLS – 2022 Q1

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0153R

TRC Environmental, Inc. conducted groundwater monitoring at the JC Weadock solid waste disposal area on 03/10/2022 for the 1<sup>st</sup> 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 03/10/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate.

The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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, 22<sup>nd</sup> 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:

<u>Acronym</u>	<u>Description</u>
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
В	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
Н	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



## **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q1-2022 JCW Leachate Wells

**Date Received:** 3/10/2022 **Chemistry Project:** 22-0153

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0153-01	LH-103R	Groundwater	03/10/2022 07:03 AM	JCW Solid Waste Disposal Area
22-0153-02	LH-103R DUP	Groundwater	03/10/2022 07:03 AM	JCW Solid Waste Disposal Area
22-0153-03	LH-103R MS	Groundwater	03/10/2022 07:03 AM	JCW Solid Waste Disposal Area
22-0153-04	LH-103R MSD	Groundwater	03/10/2022 07:03 AM	JCW Solid Waste Disposal Area
22-0153-05	FB-02	Water	03/10/2022 07:05 AM	JCW Solid Waste Disposal Area
22-0153-06	EB-02	Water	03/10/2022 07:05 AM	JCW Solid Waste Disposal Area
22-0153-07	TB-01	Water	03/10/2022 12:00 AM	JCW Solid Waste Disposal Area



Report Date:

03/24/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project: 22-0153

 Field Sample ID:
 LH-103R
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-01
 Collect Time:
 07:03 AM

Mercury, Low Level by EPA 163	31E			Aliquot #: 22-0	153-01-C01-A01	Analyst: TMR
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	2.25		ng/L	0.5	03/18/2022	AB22-0318-09
Mercury by EPA 7470A, Total,	Aqueous			Aliquot #: 22-0	153-01-C02-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rul	le Appendix III-IV To	tal Metals	s Exp	Aliquot #: 22-0	153-01-C02-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Arsenic	87		ug/L	1.0	03/18/2022	AB22-0318-04
Barium	589		ug/L	5.0	03/18/2022	AB22-0318-04
Beryllium	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Boron	8240		ug/L	20.0	03/18/2022	AB22-0318-04
Cadmium	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Calcium	253000		ug/L	1000.0	03/18/2022	AB22-0318-04
Chromium	1		ug/L	1.0	03/18/2022	AB22-0318-04
Cobalt	ND		ug/L	6.0	03/18/2022	AB22-0318-04
Copper	2		ug/L	1.0	03/18/2022	AB22-0318-04
Iron	17800		ug/L	20.0	03/18/2022	AB22-0318-04
Lead	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Lithium	188		ug/L	10.0	03/18/2022	AB22-0318-04
Magnesium	87100		ug/L	1000.0	03/18/2022	AB22-0318-04
Manganese	1290		ug/L	5.0	03/18/2022	AB22-0318-04
Molybdenum	12		ug/L	5.0	03/18/2022	AB22-0318-04
Nickel	18		ug/L	2.0	03/18/2022	AB22-0318-04
Potassium	17900		ug/L	100.0	03/18/2022	AB22-0318-04
Selenium	21		ug/L	1.0	03/18/2022	AB22-0318-04
Silver	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Sodium	156000		ug/L	1000.0	03/18/2022	AB22-0318-04
Thallium	ND		ug/L	2.0	03/18/2022	AB22-0318-04
Vanadium	5		ug/L	2.0	03/18/2022	AB22-0318-04
Zinc	ND		ug/L	10.0	03/18/2022	AB22-0318-04
Anions by EPA 300.0 CCR Rule	Analyte List, Cl, F,	SO4, Aqı	ieous	Aliquot #: 22-0	153-01-C03-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	98100		ug/L	1000.0	03/15/2022	AB22-0315-05
Fluoride	ND		ug/L	1000.0	03/15/2022	AB22-0315-05



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project: 22-0153

 Field Sample ID:
 LH-103R
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-01
 Collect Time:
 07:03 AM

Anions by EPA 300.0 CCR Rule Ana	lyte List, CI, F,	SO4, Aqu	ueous	Aliquot #: 22-0	153-01-C03-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfate	94800		ug/L	1000.0	03/15/2022	AB22-0315-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	153-01-C04-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1490		mg/L	10.0	03/14/2022	AB22-0314-06
Alkalinity by SM 2320B				Aliquot #: 22-0	153-01-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	1200000		ug/L	10000.0	03/15/2022	AB22-0315-12
Alkalinity Bicarbonate	1200000		ug/L	10000.0	03/15/2022	AB22-0315-12
Alkalinity Carbonate	ND		ug/L	10000.0	03/15/2022	AB22-0315-12



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project: 22-0153

 Field Sample ID:
 LH-103R DUP
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-02
 Collect Time:
 07:03 AM

Mercury, Low Level by EPA 1631E			Aliquot #: 22	Analyst: TMR	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury Low Level	1.74	ng/L	0.5	03/18/2022	AB22-0318-09



**Report Date:** 03/24/22

04/01/22R

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457)

Laboratory Project: **22-0153**Collect Date: 03/10/2022

Field Sample ID: LH-103R MS Lab Sample ID: 22-0153-03

Collect Time: 07:03 AM

Mercury, Low Level by EPA 1631E		0153-03-C01-A01	Analyst: TMR		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury Low Level	79	%	0.5	03/18/2022	AB22-0318-09



**Report Date:** 03/24/22

04/01/22R

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project: 22-0153

 Field Sample ID:
 LH-103R MSD
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-04
 Collect Time:
 07:03 AM

Mercury, Low Level by EPA 1631E		0153-04-C01-A01	Analyst: TMR		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury Low Level	81	%	0.5	03/18/2022	AB22-0318-09



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project: 22-0153

 Field Sample ID:
 FB-02
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-05
 Collect Time:
 07:05 AM

Matrix: Water

Mercury, Low Level by EPA 1631E	ury, Low Level by EPA 1631E Aliquot #: 22-0153						
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking		
Mercury Low Level	ND	ng/L	0.5	03/18/2022	AB22-0318-09		



**Report Date:** 03/24/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project: 22-0153

 Field Sample ID:
 EB-02
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-06
 Collect Time:
 07:05 AM

Matrix: Water

Mercury, Low Level by EPA 1631E	cury, Low Level by EPA 1631E Aliquot #: 22-01						
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking		
Mercury Low Level	ND	ng/L	0.5	03/18/2022	AB22-0318-09		



**Report Date:** 03/24/22

22-0153

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area (395457) Laboratory Project:

 Field Sample ID:
 TB-01
 Collect Date:
 03/10/2022

 Lab Sample ID:
 22-0153-07
 Collect Time:
 12:00 AM

Matrix: Water

Mercury, Low Level by EPA 1631E		0153-07-C01-A01	Analyst: TMR			
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury Low Level	ND		ng/L	0.5	03/18/2022	AB22-0318-09



A CENTURY OF EXCELLENCE

**Analytical Report** 

Report Date: 03/24/22 Count on Us® **Laboratory Services** 

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

## Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

## TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Project Log-In Number:				7	
Inspection Date: 2-10.3			Inspection By:		
Sample Origin/Project Name	e: Weac	dock (	eachoite		
Shipment Delivered By: Ent	er the type o	f shipment ca	arrier.		
Pony	FedEx	UP	SUSPS_	Air	borne
Tracking Number:			_ Shipping Form A	ttached: Yes	No
Shipping Containers: Enter	the type and	number of sh	ipping containers received		*
Cooler 2	Cardboard E	Box	Custom Case	Envelop	e/Mailer
Loose/Unpackaged C			Other		
Condition of Shipment: Ente					
Damaged Shipment C					king
Other				Lea	King.
				Sas	
Shipment Security: Enter if		95 5 1			
Shipping Containers 1	Received: C	pened	Sealed	-	
Enclosed Documents: Enter	the type of d	ocuments end	closed with the shipment.		
CoC _ Wo	ork Request		Air Data Sheet	Other	
Temperature of Containers:	Measure the	temperature	of several sample containe	rs.	
		The second section of the			Ĭo.
As-Received Tempera	Hg:8.2		Samples Received o	Freed LLH,	NO
M&TE # and Expirati	ion_01548	10-14	1.22		
Number and Type of Contain	ners: Enter	the total num	ber of sample containers re	ceived.	
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 250 m L				-	
Q as bothe	7				

round



### CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page \_ 1 \_ of \_ 1

SAMPLING SITE / CUSTOMER:			PROJECT NUMBER:	SAP CC or V	SAP CC or WO#:							A	NAI	YSI	S RI	OA DEOLUDEA GENER							
Q1-2022 Weadock Leachate Wells		22-0153	22-0153 REQUESTER: Harold Register						(Atta				QA REQUIREMENT:										
SAMI	PLING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ STANDARD ☒ OTHER														□ NPDES  □ TNI				
SEN	D REPORT TO:	Caleb Bat	ts		email:	phone:							- s								☐ ISO 17025		
	COPY TO:	Harold Re	gister		MATRIX CODES:  GW = Groundwater OX = Oth	ner	大生	C	ONT	AINI	ERS		Level									☐ 10 CFR 50 APP. B	
		TRC			WW = Wastewater SL = Slu W = Water / Aqueous Liquid A = Air		TIE!	1	PRES	ERV	/AT	IVE	Low	tals							☐ INTERNAL INFO		
	LAB	SAMPLE C	OLLECTION	XIX	S = Soil / General Solid WP = W	ipe eneral Waste	TOTAL#			7 -		MeOH	cury.	Total Metals	suc	45	Alkalinity				□ OTHER		
Sz	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	OCATION	TOT	None	None HNO <sub>3</sub>		HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaOH		NaOH HCI MeOH		Mercury.	Tota	Anions	TDS	Alka				REMARKS
1	22-0153-01	3/10/00	6003	GW	LH-103R		6	4	1		1		x	x	x	x	x						
	-02		0703	GW	LH-103R DUP		1				1		x										
	-03		0703	GW	LH-103R MS		1				1		x										
	-04		0703	GW	LH-103R MSD		1				1		x										
	-05		0767	w	FB-02		i				ī		x										
	-06		0705	W	EB-02		1				1		x										
	-07		MA	W	TB-01		1				1		x										
																-							
								H	H	+	H												
								i	H	+	H	+											
RELI	NOUISHED BY:		4	DATE	TIME:	RECEIVED BY:		-		1			CC	MMI	ENTS	S:							
RELI	VOUISHED BY:	_		O ()		RECEIVED BY:					-		100								E#: 015%2		
	V					<b>V</b> 22-0153R Page 15	of 15					1	Te	mpera	ature:	L H	y .	C °C	•c	Cal. D	ue Date: % /03/2022		



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: March 24, 2022

Subject: HMP GROUNDWATER MONITORING – JCWEADOCK ASD – 2022 Q1

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Environmental Corporation

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0152

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site on 03/07/2022 through 03/09/2022, for the 1<sup>st</sup> 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 03/09/2022 and 03/10/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate.

The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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:

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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



### **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex Work Order ID: Q1-2022 Weadock ASD

**Date Received:** 3/10/2022 **Chemistry Project:** 22-0152

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0152-01	JWC-OW-18004	Groundwater	03/07/2022 06:45 AM	JC Weadock ASD
22-0152-02	OW-53	Groundwater	03/08/2022 10:30 AM	JC Weadock ASD
22-0152-03	OW-54	Groundwater	03/09/2022 07:49 AM	JC Weadock ASD
22-0152-04	OW-55	Groundwater	03/07/2022 10:51 AM	JC Weadock ASD





A CENTURY OF EXCELLENCE

Report Date: 03/24/22

JC Weadock ASD Sample Site: Laboratory Project: 22-0152

Field Sample ID: JWC-OW-18004 Collect Date: 03/07/2022 Lab Sample ID: 22-0152-01 Collect Time: 06:45 AM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueo	us			Aliquot #: 22-0	152-01-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rule App	endix III-IV To	tal Metal	s Exp	Aliquot #: 22-0	152-01-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Arsenic	1		ug/L	1.0	03/18/2022	AB22-0318-04
Barium	67		ug/L	5.0	03/18/2022	AB22-0318-04
Beryllium	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Boron	705		ug/L	20.0	03/18/2022	AB22-0318-04
Cadmium	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Calcium	156000		ug/L	1000.0	03/18/2022	AB22-0318-04
Chromium	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Cobalt	ND		ug/L	6.0	03/18/2022	AB22-0318-04
Copper	3		ug/L	1.0	03/18/2022	AB22-0318-04
Iron	35		ug/L	20.0	03/18/2022	AB22-0318-04
Lead	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Lithium	ND		ug/L	10.0	03/18/2022	AB22-0318-04
Magnesium	67600		ug/L	1000.0	03/18/2022	AB22-0318-04
Manganese	15		ug/L	5.0	03/18/2022	AB22-0318-04
Molybdenum	ND		ug/L	5.0	03/18/2022	AB22-0318-04
Nickel	12		ug/L	2.0	03/18/2022	AB22-0318-04
Potassium	1800		ug/L	100.0	03/18/2022	AB22-0318-04
Selenium	3		ug/L	1.0	03/18/2022	AB22-0318-04
Silver	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Sodium	74400		ug/L	1000.0	03/18/2022	AB22-0318-04
Thallium	ND		ug/L	2.0	03/18/2022	AB22-0318-04
Vanadium	ND		ug/L	2.0	03/18/2022	AB22-0318-04
Zinc	ND		ug/L	10.0	03/18/2022	AB22-0318-04
Anions by EPA 300.0 CCR Rule Analy	/te List. Cl. F.	SO4. Agu	ieous	Aliguot #: 22-0	152-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	95900	9	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L ug/L	1000.0	03/10/2022	AB22-0310-07 AB22-0310-07
Sulfate	178000		-		03/15/2022	AB22-0310-07 AB22-0310-07
Sullate	170000		ug/L	1000.0	03/13/2022	ADZZ-U31U-U/



A CENTURY OF EXCELLENCE

### **Analytical Report**

**Report Date:** 03/24/22

Sample Site: JC Weadock ASD Laboratory Project: 22-0152

 Field Sample ID:
 JWC-OW-18004
 Collect Date:
 03/07/2022

 Lab Sample ID:
 22-0152-01
 Collect Time:
 06:45 AM

Matrix: Groundwater

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	152-01-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1000	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	152-01-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	501000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	501000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11

### **Analytical Report**

Report Date:

03/24/22



A CENTURY OF EXCELLENCE

Sample Site: JC Weadock ASD Laboratory Project: 22-0152

 Field Sample ID:
 OW-53
 Collect Date:
 03/08/2022

 Lab Sample ID:
 22-0152-02
 Collect Time:
 10:30 AM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueou	s			Aliquot #: 22-0	152-02-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV Tota	l Metals	s Ехр	Aliquot #: 22-0	152-02-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Arsenic	11		ug/L	1.0	03/18/2022	AB22-0318-04
Barium	392		ug/L	5.0	03/18/2022	AB22-0318-04
Beryllium	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Boron	4000		ug/L	20.0	03/18/2022	AB22-0318-04
Cadmium	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Calcium	138000		ug/L	1000.0	03/18/2022	AB22-0318-04
Chromium	1		ug/L	1.0	03/18/2022	AB22-0318-04
Cobalt	ND		ug/L	6.0	03/18/2022	AB22-0318-04
Copper	3		ug/L	1.0	03/18/2022	AB22-0318-04
Iron	1950		ug/L	20.0	03/18/2022	AB22-0318-04
Lead	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Lithium	56		ug/L	10.0	03/18/2022	AB22-0318-04
Magnesium	39100		ug/L	1000.0	03/18/2022	AB22-0318-04
Manganese	354		ug/L	5.0	03/18/2022	AB22-0318-04
Molybdenum	ND		ug/L	5.0	03/18/2022	AB22-0318-04
Nickel	10		ug/L	2.0	03/18/2022	AB22-0318-04
Potassium	8400		ug/L	100.0	03/18/2022	AB22-0318-04
Selenium	14		ug/L	1.0	03/18/2022	AB22-0318-04
Silver	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Sodium	82800		ug/L	1000.0	03/18/2022	AB22-0318-04
Thallium	ND		ug/L	2.0	03/18/2022	AB22-0318-04
Vanadium	2		ug/L	2.0	03/18/2022	AB22-0318-04
Zinc	ND		ug/L	10.0	03/18/2022	AB22-0318-04
Anions by EPA 300.0 CCR Rule Analyt	e List. Cl. F. S	04. Aaı	ieous	Aliquot #: 22-0	152-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	82000	9	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	ND		ug/L ug/L	1000.0	03/10/2022	AB22-0310-07 AB22-0310-07
Sulfate	56200		-			
Sullate	30200		ug/L	1000.0	03/10/2022	AB22-0310-07



A CENTURY OF EXCELLENCE

### **Analytical Report**

**Report Date:** 03/24/22

Sample Site: JC Weadock ASD

Field Sample ID: OW-53
Lab Sample ID: 22-0152-02
Matrix: Groundwater

Laboratory Project: **22-0152**Collect Date: 03/08/2022

Collect Time: 10:30 AM

Total Dissolved Solids by SM 2540C			Aliquot #: 22-0	0152-02-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Total Dissolved Solids	790	mg/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B			Aliquot #: 22-0	)152-02-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Alkalinity Total	562000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	562000	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug/L	10000.0	03/15/2022	AB22-0315-11

### **Analytical Report**

Report Date:

03/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JC Weadock ASD Laboratory Project: 22-0152

 Field Sample ID:
 OW-54
 Collect Date:
 03/09/2022

 Lab Sample ID:
 22-0152-03
 Collect Time:
 07:49 AM

Matrix: Groundwater

Mercury by EPA 7470A, Tot	al, Aqueous		Aliquot #: 22-	0152-03-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Uni	ts RL	<b>Analysis Date</b>	Tracking
Mercury	ND	ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR	Rule Appendix III-IV Tot	tal Metals Exp	Aliquot #: 22-	0152-03-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Uni		Analysis Date	Tracking
Antimony	ND	ug/L	1.0	03/18/2022	AB22-0318-04
Arsenic	54	ug/L	1.0	03/18/2022	AB22-0318-04
Barium	312	ug/L	5.0	03/18/2022	AB22-0318-04
Beryllium	ND	ug/L	1.0	03/18/2022	AB22-0318-04
Boron	5760	ug/L	20.0	03/18/2022	AB22-0318-04
Cadmium	ND	ug/L	0.2	03/18/2022	AB22-0318-04
Calcium	160000	ug/L	1000.0	03/18/2022	AB22-0318-04
Chromium	ND	ug/L	1.0	03/18/2022	AB22-0318-04
Cobalt	ND	ug/L	6.0	03/18/2022	AB22-0318-04
Copper	1	ug/L	1.0	03/18/2022	AB22-0318-04
Iron	9230	ug/L	20.0	03/18/2022	AB22-0318-04
Lead	ND	ug/L	1.0	03/18/2022	AB22-0318-04
Lithium	103	ug/L	10.0	03/18/2022	AB22-0318-04
Magnesium	52200	ug/L	1000.0	03/18/2022	AB22-0318-04
Manganese	393	ug/L	5.0	03/18/2022	AB22-0318-04
Molybdenum	ND	ug/L	5.0	03/18/2022	AB22-0318-04
Nickel	10	ug/L	2.0	03/18/2022	AB22-0318-04
Potassium	4510	ug/L	100.0	03/18/2022	AB22-0318-04
Selenium	14	ug/L	1.0	03/18/2022	AB22-0318-04
Silver	ND	ug/L	0.2	03/18/2022	AB22-0318-04
Sodium	49200	ug/L	1000.0	03/18/2022	AB22-0318-04
Thallium	ND	ug/L	2.0	03/18/2022	AB22-0318-04
Vanadium	ND	ug/L	2.0	03/18/2022	AB22-0318-04
Zinc	ND	ug/L	10.0	03/18/2022	AB22-0318-04
Anions by EPA 300.0 CCR	Rule Analyte List. Cl. F. :	SO4, Aqueous	6 Aliquot #: 22-	0152-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Uni	•	Analysis Date	Tracking
Chloride	82700	ug/L	1000.0	03/10/2022	AB22-0311-03
Fluoride	ND	ug/L	1000.0	03/10/2022	AB22-0311-03
Sulfate	8710	ug/L	1000.0	03/10/2022	AB22-0311-03
	3	~g/ <b>∟</b>	1000.0	33, . 0, <u>L</u> 0 <u>L</u> L	0011 00



### **Analytical Report**

Report Date: 03/24/22

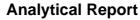
JC Weadock ASD Sample Site:

A CENTURY OF EXCELLENCE

Laboratory Project: 22-0152 Field Sample ID: **OW-54** Collect Date: 03/09/2022 Lab Sample ID: 22-0152-03 Collect Time: 07:49 AM

Matrix: Groundwater

Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	152-03-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	766	1	mg/L	10.0	03/14/2022	AB22-0314-06
Alkalinity by SM 2320B				Aliquot #: 22-0	152-03-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	629000	ı	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	629000	ı	ug/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ı	ug/L	10000.0	03/15/2022	AB22-0315-11





A CENTURY OF EXCELLENCE

Report Date: 03/24/22

JC Weadock ASD Sample Site: Laboratory Project: 22-0152

Field Sample ID: **OW-55** Collect Date: 03/07/2022 Lab Sample ID: 22-0152-04 Collect Time: 10:51 AM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueou	s			Aliquot #: 22-0	152-04-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND		ug/L	0.2	03/15/2022	AB22-0315-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV Tota	l Metals	s Ехр	Aliquot #: 22-0	152-04-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Arsenic	6		ug/L	1.0	03/18/2022	AB22-0318-04
Barium	374		ug/L	5.0	03/18/2022	AB22-0318-04
Beryllium	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Boron	2090		ug/L	20.0	03/18/2022	AB22-0318-04
Cadmium	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Calcium	170000		ug/L	1000.0	03/18/2022	AB22-0318-04
Chromium	2		ug/L	1.0	03/18/2022	AB22-0318-04
Cobalt	ND		ug/L	6.0	03/18/2022	AB22-0318-04
Copper	2		ug/L	1.0	03/18/2022	AB22-0318-04
Iron	3420		ug/L	20.0	03/18/2022	AB22-0318-04
Lead	ND		ug/L	1.0	03/18/2022	AB22-0318-04
Lithium	25		ug/L	10.0	03/18/2022	AB22-0318-04
Magnesium	32900		ug/L	1000.0	03/18/2022	AB22-0318-04
Manganese	239		ug/L	5.0	03/18/2022	AB22-0318-04
Molybdenum	ND		ug/L	5.0	03/18/2022	AB22-0318-04
Nickel	12		ug/L	2.0	03/18/2022	AB22-0318-04
Potassium	7590		ug/L	100.0	03/18/2022	AB22-0318-04
Selenium	4		ug/L	1.0	03/18/2022	AB22-0318-04
Silver	ND		ug/L	0.2	03/18/2022	AB22-0318-04
Sodium	53300		ug/L	1000.0	03/18/2022	AB22-0318-04
Thallium	ND		ug/L	2.0	03/18/2022	AB22-0318-04
Vanadium	2		ug/L	2.0	03/18/2022	AB22-0318-04
Zinc	ND		ug/L	10.0	03/18/2022	AB22-0318-04
Anions by EPA 300.0 CCR Rule Analyt	elist CLF S	04 Δαι	IEOUS	Aliquot #: 22-0	152-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	20900	9	ug/L	1000.0	03/10/2022	AB22-0310-07
Fluoride	20900 ND		-			
			ug/L	1000.0	03/10/2022	AB22-0310-07
Sulfate	4870		ug/L	1000.0	03/10/2022	AB22-0310-07



### **Analytical Report**

**Report Date:** 03/24/22

A CENTURY OF EXCELLENCE

Sample Site:JC Weadock ASDLaboratory Project:22-0152Field Sample ID:OW-55Collect Date:03/07/2022Lab Sample ID:22-0152-04Collect Time:10:51 AM

Matrix: Groundwater

Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	152-04-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag l	Jnits	RL	Analysis Date	Tracking
Total Dissolved Solids	831	m	g/L	10.0	03/10/2022	AB22-0310-04
Alkalinity by SM 2320B				Aliquot #: 22-0	)152-04-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag l	Jnits	RL	<b>Analysis Date</b>	Tracking
Alkalinity Total	669000	ug	g/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Bicarbonate	669000	ug	g/L	10000.0	03/15/2022	AB22-0315-11
Alkalinity Carbonate	ND	ug	g/L	10000.0	03/15/2022	AB22-0315-11





**Report Date:** 03/24/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

### Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

### TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Project Log-In Number: 22 - [	0152			
Inspection Date: 3.9.22		Inspection By:	dmw	
^	-2m2	Wedock ASD	0-14 14	
		7		
Shipment Delivered By: Enter the type of	shipment car	rrier.		
Pony FedEx Other/Hand Carry (whom)	_	SUSPS_	Air	borne
Tracking Number: 2706, 316	1 5842	Shipping Form A	ttached: Yes	No
Shipping Containers: Enter the type and n	umber of shi	ipping containers received.		
Cooler Cardboard Bo	ox	Custom Case	Envelop	e/Mailer
Loose/Unpackaged Containers		Other		
Condition of Shipment: Enter the as-receive		n of the shipment contains	10	
The state of the s	/			
Damaged Shipment Observed: No.			Lea	king
Other				
Shipment Security: Enter if any of the ship	ping contain	ners were opened before re	ceipt.	
Shipping Containers Received: Op	ened	Sealed		
Enclosed Documents: Enter the type of do	cuments and	locad with the chinment		
THE R. P. LEWIS CO., LANSING MICH. LANSING MICH.		Air Data Sheet	Other	
Temperature of Containers: Measure the t	emperature c	of several sample container	·s.	
As-Received Temperature Range_			/	No
			il icc. i cs i	10
M&TE # and Expiration 015407	7 01217			
Number and Type of Containers: Enter th	e total numb	er of sample containers re-	ceived.	
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)	0		- 1	3
24 mL vial (glass)				
500 mL (plastic)				
Other 1:50 ml	_	-		

CONSUMERS ENERGY

### Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

### TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Project Log-In Number: 27.0152- Inspection Date: 3-10-22		1 1	0	
		Inspection By:		
Sample Origin/Project Name: West	10 CM		-	
Shipment Delivered By: Enter the type of s	hipment car	rier.		
Pony FedEx_	UPS	SUSPS_	Air	borne
Other/Hand Carry (whom)				
Tracking Number: 270 L 795	50 4504	Shipping Form Att	ached: Yes	No
Shipping Containers: Enter the type and nu	mber of shi	pping containers received.		
Cooler Cardboard Box	x	Custom Case	Envelor	e/Mailer
Loose/Unpackaged Containers		Other		
Condition of Shipment: Enter the as-receiv		A THE REAL PROPERTY OF THE PARTY OF THE PART		
Damaged Shipment Observed: Non			_ Lea	king
Other				
Shipment Security: Enter if any of the ship	ping contain	ers were opened before rec	eipt.	
Shipping Containers Received: Ope	ened	Sealed_		
Enclosed Documents: Enter the type of doc	uments encl	osed with the shipment.		
CoC Work Request			Other	
Temperature of Containers: Measure the te	mperature o	f several sample containers	i.	
As-Received Temperature Range 2	Carried Contract	Samples Received on		Jo
			100. 1051	
M&TE # and Expiration	10-14-0	? 4		
Number and Type of Containers: Enter the	total numb	er of sample containers rec	eived.	
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 250mc 1	_		-	_

## **CHAIN OF CUSTODY**



### CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page \_\_\_\_ of \_\_\_\_

SAM	PLING SITE / CU	STOMER:			PROJECT NUMBER:	SAP CC or WO	D#:										REQ			QA REQUIREMENT:
Q1-2	022 Weadock A	SD			22-0152 REQUESTER: F			ld F	Regis	ster			H	(Atta	ch Li	st if N	fore Spa	ace is N	eeded)	QA REQUIREMENT.
SAM	PLING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ S	TANDARD 🛮 OTI	HER_													□ NPDES  ☑ TNI
SEN	D REPORT TO:	Caleb Batts			email:	phone:														☐ ISO 17025
	COPY TO:	Harold Regi	ster		MATRIX CODES:  GW = Groundwater OX = Other	er		CC	ONT	AIN	ERS									☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Slud W = Water / Aqueous Liquid A = Air	ige		F	RES	ERV	/AT	IVE	Metals			1				☐ INTERNAL INFO
	LAB	SAMPLE COL	LECTION	XIX	S = Soil / General Solid WP = Wi	pe neral Waste	TOTAL#			-		_		suo		Alkalinity				□ OTHER
S	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LC	OCATION	TOT	None	HNO <sub>3</sub>	NaOF	HCI	MeOl	Total	Anions	TDS	Alka				REMARKS
H	22-0152-01	3/7/0	don't	GW	JCW- <b>W</b> W-18004		5	4	i				x	x	x	x				
	-02	318/20	1030	GW	OW-53		5	4	1				x	x	x	x				
	-03			GW	OW-54		5	4	1;				x	x	x	x		-13		
	-04	3/7/8)	1051	GW	OW-55		5	4	1				x	x	x	x				
																		4		
										1										
								1												
										4										
								¥.	E.	1										
RELI	NQUISHED BY:			DATE/	TIME	RECEIVED BY:					L		CC	MMI	ENTS					
1	1	_	3/8	10	1400	Fedex														
RELI	NOUISHED BY:			DATE/	TIME:	RECEIVED BY:					Ī		Re	ceive	d on I	ce? [	Yes	□ No	M&T	E#: 015402 Due Date: 6-3-27
	Fede	34	03-	09-	2022 11:30	22-0152 Page 16 of	17						Te	mpera	iture:	1.2	- 3.8	°C	Cal. I	Due Date: 6-3-27

## **CHAIN OF CUSTODY**



### CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page \_\_\_\_ of \_\_\_\_

SAMP	LING SITE / CU	ISTOMER:			PROJECT NUMBER:	SAP CC or W	VO#:							A	NAI	YSI	S RE	QUE	STED		OA BEOLUBEMENT.
Q1-20	22 Weadock A	SD			22-0152	REQUESTE	R: Haro	old l	Regi	ster									s Neede	d)	QA REQUIREMENT:
SAMP	LING TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ S	TANDARD ⊠ O	THER_														□ NPDES  ⊠ TNI
SENE	REPORT TO:	Caleb Batts			email:	phone:															☐ ISO 17025
(	COPY TO:	Harold Regis	ster		MATRIX CODES:  GW = Groundwater OX = Other	er		C	ONT	AIN	ER	S									☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Slud W = Water / Aqueous Liquid A = Air	ge			PRE	SER	VAT	TVE	tals								☐ INTERNAL INFO
	LAB	SAMPLE COL	LECTION	RIX	S = Soil / General Solid WP = Wij O = Oil WT = Get	pe neral Waste	TOTAL#			7		Ξ.	Total Metals	suc		Alkalinity					□ OTHER
SA	MPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOT	None	HNO	H,SC	HCI	MeOH	Tota	Anions	TDS	Alka					REMARKS
2	2-0152-01			GW	JCW-MW-18004		5	4	1				x	x	x	x					
	-02			GW	OW-53		5	4	1				x	x	x	x					
	-03	318/34	0749	GW	OW-54		5	4	1				x	x	x	x					
	-04			GW	OW-55		5	4	1				x	x	x	x					
											ľ										
										i	Ī						*				
										T											
								Ī			Ī	П									
RELIN	QUISHED BY:			DATE/	TIME:	RECEIVED BY:			1-1			1-1-	C	OMM	ENT	S:					
				2/	9/20 /430	A F	red i	64													
RELIN	QUISHED BY:	1		DATE		RECEIVED BY:	·LE						Re	eceive	d on	Ice?	Ye	s 🗆 N	lo N	и&те	#: 015484
	0	Fed E	<	0	3-10-22 1245	A							Te	mper	ature	2.4	- 4.	.6°C	C	Cal. Du	ue Date: 10-14-24
						22-0152 Page 17	of 17														



# **Appendix F Field Records**



PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance
PROJECT NUMBER:	464096.0000.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	First Quarter 2022 HMP Sampling and Supplemental CCR sampling
PURPOSE OF FIELDWORK:	
	Javier Jasso
WORK PERFORMED BY:	

SIGNED DAT

CHECKED BY DATE



PROJECT NAME:	CEC Weadock LF: 2022 GW Com	DATE: 2	2013	TIME ARRIVED: ()73-
PROJECT NUMBER:		AUTHOR		TIME LEFT: 104 V
		WEATHER		
TEMPERATURE:	۴ WIND: ۱۶	MPH	VISIBILITY	overcont
	WORK / SA	MPLING P	ERFORMED	
water la	rels			
	,			
	·			
			·	
PROF	BLEMS ENCOUNTERED		CORRECTIVE	ACTION TAKEN
	,			
	NA		M	
	V		7041	
	·			
	CO	MMUNICAT	TION	
NAME	REPRESENTING		SUBJECT / COMME	ENTS
	<del>}</del>			
	V			
	INVESTIGATION	DEBIVED	VASTE SUMMARY	
WASTE MATRIX	QUANTITY	DERIVED	COMMENTS	<u>*</u>
				1
			·	
<del></del>			<u> </u>	
	- 2/11/27		10	V 3-15-2
SIGNED		_ E	CHECKED BY	DATE
	DATE	_		5,



**REVISED 04/2019** 

PROJECT NAME:	CEC Weadock LF: 2022 (	GW Com DATE:	3/7/22	TIME ARRIVED: US30
PROJECT NUMBER:	464096.0000.00	000 AUTHO	R: Javier Jasso	TIME LEFT: \\\(\frac{\psi}{}\)
wan.				
26	)	WEATHE	<del></del>	
TEMPERATURE: 30	) °F WIND: .	MPH MPH	VIS	IBILITY: OUL COST Shown
		RK / SAMPLING	PERFORMED	
wells SA	mosed	1		10 20 10 10 10 10
Λ	Jew mw 18	001. MS +M	1911 JUVINU	18004, Jan on 18004 nu 18004, mu 58
110 25,00	/SC,JUWMW	100,2	40 # 1, JCW	1000 MM 20
		<u> </u>		
action	y Supplys			
PROBL	EMS ENCOUNTERED		CORRE	CTIVE ACTION TAKEN
	NA		$\sim\sim\sim$	<del>4</del>
	•			
		COMMUNIC	ATION	
NAME	REPRESENTING	COMMONIO	SUBJECT/	COMMENTS
ALA	1M		M	
7010	7011			
		ATION DERIVED	WASTE SUMMARY	<b>1</b>
WASTE MATRIX	QUANTITY		СОММ	ENTS
0 . 1.0		2 22 4	J	
purge never	NM	pwgen	to you	nu
	1 1			2 04
	3/11/2	· }	_//wl	Jeny 3-15-2
SIGNED ( )		DATE	CHECKED BY	DATE
$\smile$			( /	



PROJECT NAME:	CEC Weadock LF: 2022 G	W Com DATE:	3/8/27	TIME ARRIVED: OCO T
PROJECT NUMBER:	464096.0000.000	00 AUTHO	R: Javier Jasso	TIME LEFT: 1300
		WEATHE	:B	annish e e e e
TEMPERATURE: 19	) °F WIND:	WEATHE		BILITY: (\@W
TEIWII EIVATOINE. 1				DICITI. L. LOV
- v o . [		K / SAMPLING		)
WM. 2019	Sup#2,51	<u>(74, 57</u>	, 000-33/h	(007912
	Shipping S	SAmole	2	
	~ 110 ft . 110 /	<u> </u>	<b>.</b>	
			-	
PROBL	EMS ENCOUNTERED		CORREC	CTIVE ACTION TAKEN
	<u> </u>			Λ
	N17		$\sim$ $\sim$ $\sim$	$\mathcal{M}$
·		COMMUNIC	ATION	
NAME	REPRESENTING		SUBJECT / C	OMMENTS
M	NA	$\mathcal{M}_{\mathcal{A}}$		
<u> </u>	111/2021	TION D=5	WASTE COMMENT	The second secon
WASTE MATRIX	QUANTITY	TION DERIVEL	WASTE SUMMARY	
purge martier	NM	project	to grown	<u> </u>
1 1				- \
	2/11/2	١	100	200
SIGNED	9/11/00	DATE	CHECKED BY	3-15-0 DATE
/ /		DATE	STIEGE BY	U DAT



PROJECT NAME:	CEC Weadock LF: 2022 GW Com	DATE: ろし	7127	TIME ARRIVED: Cocu
PROJECT NUMBER:	464096.0000.0000	AUTHOR: Ja	avier Jasso	TIME LEFT: 08 50
		WEATHER		
TEMPERATURE: 36	) °F WIND: (J)	MPH	VISIBILIT	r: Over cont
		MPLING PERF		
Me str	ou sy ow	57R out	15,13 TI 1+	りずり
			,	•
	<u> </u>			
		- <del></del>		
PROBL	EMS ENCOUNTERED		CORRECTIVE	E ACTION TAKEN
			AAA	<u> </u>
	/\/\		/(///	
	· · · · · · · · · · · · · · · · · · ·			And the second s
NAME	CO REPRESENTING	MMUNICATION	SUBJECT / COMMI	ENTS
NH	M	MA		
,				
	INVESTIGATION	DERIVED WAS	TE SUMMARY	
WASTE MATRIX	QUANTITY		COMMENTS	
Durce unter	Nm	morrel	to grow	น
1 221		p - 40-5		
	3/11/22	_	Le	Jun 3-15-2
SIGNED	DATI		HECKED BY	DATE



### **EQUIPMENT SUMMARY**

PROJECT NAME: CEC Weadock LF: 2022 GW Cd	SAMPLER NAME: Javier Jasso
PROJECT NO.: 464096.0000.0000	DAIVIE LEIN IVAIVIE. JAVIEI JASSU
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 COLLE	CTED 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	CE
STORE BOUGHT	LABORATORY PROVIDED
SIGNED DATE  REVISED 04/2019	DI WATER SOURCE  3-15-22  CHECKED BY  DATE



PROJECT NAME:	CEC Weadock LF: 2022 GV	V Complian	ice	MODEL	YSI Pro DS	S	SAMPLER:	JJ	
PROJECT NO.:	464096.0000.0000			SERIAL	#: TRC	A2	DATE:3 (7 ()	1	
PH	CALIBRATION CHECK			1	SP	FCIFIC CONDI	JCTIVITY CALIBI	RATION C	HECK
pH 7 (LOT #):  6 06  (EXP. DATE): 4 23	pH 4 / 10 (LOT #): (65 780 (EXP. DATE): (66 33	CAL. RANGE	TIME			READING	TEMPERATURE	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL READING / STANDARD	WITHIN		_		reading/standard	NA	WITHIN RANGE	
1	1	RANGE WITHIN RANGE		_		1		RANGE WITHIN RANGE	
/	/	WITHIN RANGE				/		WITHIN RANGE	
	CALIBRATION CHECK		<del>,</del>	1	· · · · · · · · · · · · · · · · · · ·		IBRATION CHEC	K .	
CAL. READING (LOT #): > 10166313 (EXP. DATE): 4126 POST-CAL. READING / STANDARD	TEMPERATURE (*CELSIUS)	CAL. RANGE	TIME			. READING ADING/SATURATED AII	TEMPERATURE  (°CELSIUS)	CAL. RANGE	TIME
JX) 1270	21.0	WITHIN RANGE		-	86	7/867	21.6	WITHIN RANGE WITHIN RANGE	D31
1		□ WITHIN RANGE				1		WITHIN RANGE	
/		RANGE		_				RANGE	
	ITY CALIBRATION CHEC	K	γ	7			COMMENTS		
	READING (NTU)					AL SOLUTION	☑ STANDARD	SOLUTION	(S)
(LOT #): "HIMIG (EXP. DATE): "7 13	(LOT #): (EXP. DATE):	CAL. RANGE	TIME		(LOT #): (EXP. DATE):		LIST LOT NUMBERS A UNDER CALIE		
POST-CAL. READING / STANDARD	POST-CAL, READING / STANDARD			_	CALIBRAT	ED PARAMETERS	CALIBRATI	ON RANGES (	(1)
6 10	Fr.	WITHIN				H	pH: +/- 0.2 S.	U.	
100 / 100	/	RANGE WITHIN	033~	-	l _	COND		F CAL. STAN	1DARD
	/	RANGE WITHIN				ORP D.O.	ORP: +/- 25 m\		
•	NOTES	RANGE	<u> </u>			TURB		F CAL. STAN	NDARD
							(1) CALIBRATION RAI THE MODEL OF THE		
· · · · · · · · · · · · · · · · · · ·	PROBLEMS ENCOUNTERED					CORRECT	TIVE ACTIONS		
	2/11/2					1 0	- N		3-15-

# O \_ STRC

## WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2022 GV	V Complian	Ce	MODEL:	YSI Pro DS	s	SAMPLER:	JJ		
PROJECT NO.:	464096.0000.0000	· Compilari		SERIAL #				<del></del>		
PROJECT NO	404090.0000.0000			SERIAL #	F. 11\O		318	(9 g		
PH (	CALIBRATION CHECK						CTIVITY CALIBI		HECK	
(LOT #): (COLOS) (EXP. DATE): 9 D3  POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): (6 3) 80 (EXP. DATE): 10 / 23 POST-CAL. READING / STANDARD	CAL. RANGE	TIME		(LOT #): <b>(6</b> (EXP. DATE):		TEMPERATURE	CAL. RANGE	TIME	
70, 1700	7401/1 400	WITHIN	17520	1,	1413	11413	1/A	WITHIN	০53	છ
10,100	/	MITHIN	7770		,	1	70	WITHIN	<u> </u>	ĺ
,	,	RANGE WITHIN						RANGE		
· · · · · · · · · · · · · · · · · · ·	,	RANGE		-		,		RANGE WITHIN		l
OPP.	CALIBRATION CHECK	RANGE	ļ	]		DO CAL	IBRATION CHE	RANGE		l
CAL. READING	TEMPERATURE	1	r :	7	CAL	. READING	TEMPERATURE		· ·	İ
(LOT #): 210 100 313 (EXP. DATE): VIDC	(°CELSIUS)	CAL. RANGE	TIME		OAL	. READING	(°CELSIUS)	CAL. RANGE	TIME	
POST-CAL. READING / STANDARD		<u> </u>		_	POST-CAL. RE	ADING /SATURATED AIR	R	1		
330 / 330	23.0	WITHIN	0530	· /	7.89	17.84	260	WITHIN	0530	L
1		WITHIN RANGE				1		☐ WITHIN RANGE		
1		☐ WITHIN RANGE		]		1		☐ WITHIN RANGE		
1		☐ WITHIN		1		1		WITHIN RANGE		
TURBID	ITY CALIBRATION CHEC	CK	J	_			COMMENTS			
1	READING (NTU)			1	☐ AUTOC	CAL SOLUTION	☑ STANDAR	SOLUTION	(S)	1
(LOT #): A119Ce	(LOT #):	CAL.	TIME		(LOT #):		LIST LOT NUMBERS	AND EXPIRAT		
(EXP. DATE): 7 73	(EXP. DATE):	RANGE			(EXP. DATE)	<del></del>				
POST-CAL, READING / STANDARD	POST-CAL READING / STANDARD	M WITHIN	1 / 15	-	<del> </del>	FED PARAMETERS	+	ION RANGES		┨
0 1 0	/	RANGE	071	_	_	рН	pH: +/- 0.2 S		10.450	
100/100	/	RANGE	077			COND ·		OF CAL. STAN	NDARD	
	1	RANGE		_		ORP	ORP: +/- 25 m	V .		
1	/	WITHIN RANGE				D.O.	D.O.: VARIES			
	NOTES			_		TURB	TURB: +/- 5% (	OF CAL. STAI	NDARD	
							(1) CALIBRATION RATHE MODEL OF THE			2
							-1			י
	PROBLEMS ENCOUNTERED					CORRECT	TIVE ACTIONS			-
					-	-				-
SIGNED	3/11/28	DATE	_		CHE	And EKED BY	My	7-18	5-22 DATE	

## \* TRC

### WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2022 GV	V Complianc	e	MODEL: YSI Pro DSS	SAMPLER:	JJ
PROJECT NO.:	464096.0000.0000			SERIAL #: TRC A2	DATE: 3/4/	<b>a</b> )
PH	CALIBRATION CHECK			SPECIFIC CONDU	CTIVITY CALIBR	RATION CHECK
pH 7	pH 4 / 10	Π	-	CAL. READING	TEMPERATURE	
(LOT #): [(CL DO) (EXP. DATE): 9 33 POST-CAL. READING / STANDARD	(LOT #): [65 766 (EXP. DATE): 1013 POST-CAL. READING / STANDARD	CAL. RANGE	TIME	(LOT #): (GMO)-( (EXP. DATE): // )- POST-CAL. READING / STANDARD	(°CELSIUS)	CAL. RANGE TIME
700 1700	400 1400	WITHIN RANGE	0530	1913 11913	AG	WITHIN RANGE () \$30
1	1	WITHIN RANGE				☐ WITHIN RANGE
1	1	WITHIN RANGE		1		☐ WITHIN RANGE
1	1	☐ WITHIN RANGE		1		☐ WITHIN RANGE
ORP	CALIBRATION CHECK			D.O. CAL	IBRATION CHEC	ĊK .
CAL. READING	TEMPERATURE			CAL. READING	TEMPERATURE	
(LOT #): 2 DICO 3 13 (EXP. DATE): 4 L	(°CELSIUS)	CAL. RANGE	TIME	POST-CAL. RÉADING /SATURATED AIR	(°CELSIUS)	CAL. RANGE TIME
	22.5	WITHIN	ひちと			WITHIN USA
) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	23.0	RANGE WITHIN RANGE	072	804/804	25.	RANGE CO1
1		☐ WITHIN RANGE		/		☐ WITHIN RANGE
1		☐ WITHIN RANGE		]   /		WITHIN RANGE
TURBID	ITY CALIBRATION CHEC			J	COMMENTS	J
	READING (NTU)			☐ AUTOCAL SOLUTION	☑ STANDARD	SOLUTION (S)
(LOT #):A11910	(LOT #):	CAL. RANGE	TIME	(LOT#):		AND EXPIRATION DATES BRATION CHECK
POST-CAL. READING / STANDARD	(EXP. DATE):  POST-CAL. READING / STANDARD	RANGE		(EXP. DATE):  CALIBRATED PARAMETERS		ON RANGES (1)
0 / 0	/	WITHIN	()53	□ pH	pH: +/- 0.2 S	<u> </u>
100/10	,	WITHIN	1125	†   <sup>-</sup> '	COND: +/- 1% O	F CAL. STANDARD
100 100	· /	RANGE WITHIN RANGE	000	_ □ ORP	ORP: +/- 25 m	<i>V</i>
1	1	WITHIN		D.O.	D.O.: VARIES	
	NOTES	RANGE		TURB	TURB: +/- 5% O	F CAL. STANDARD
						NGES ARE SPECIFIC TO WATER QUALITY METER
	PROBLEMS ENCOUNTERED			CORRECT	IVE ACTIONS	
		1 1111				
						4
	21			101	2	2 (5-0)
SIGNED	3/11/2,	DATE		CHECKED BY	pry	3-15-22 DATE
\				1)		



## WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2022 GV	V Compliand	e	MODEL: YSI Pro	DSS		SAMPLER:	IJ	
PROJECT NO.:	464096.0000.0000			SERIAL#: TF	RC A2	2	DATE: 3 (C	122	
PH (	CALIBRATION CHECK				SPEC	CIFIC CONDU	CTIVITY CAL	IBRATION C	HECK
(LOT #): (6   0   0   0   0   0   0   0   0   0	pH 4 / 10 (LOT #): 165700 (EXP. DATE): 10133	CAL. RANGE	TIME	(LOT#): (EXP. DA	16 K	ulda Ulda ulda	TEMPERATUI	CAL. RANGE	TIME
POST-CAL READING / STANDARD	POST-CAL, READING / STANDARD	WITHIN	ე <i>5</i> 30	POST-C		/1413	10A	WITHIN	(25)
1	1	WITHIN RANGE WITHIN RANGE	<del></del>			/ /		WITHIN RANGE WITHIN RANGE	·
1	1	WITHIN RANGE				1		☐ WITHIN RANGE	
	CALIBRATION CHECK						IBRATION CH	IECK	,
CAL. READING (LOT #): > 1010313 (EXP. DATE): 4/26	TEMPERATURE (*CELSIUS)	CAL. RANGE	TIME	C	CAL. F	READING	TEMPERATU (*CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD				POST-CAL	L. READI	ING /SATURATED AIR			
390,320	23	WITHIN RANGE	0,230	ප	35	18.35	23	WITHIN RANGE	007
/		RANGE WITHIN				1		RANGE WITHIN	
/		RANGE WITHIN		-		1		RANGE WITHIN RANGE	1
TURBID	I ITY CALIBRATION CHEC	RANGE		J L			COMMENTS		l
	READING (NTU)	T		☐ AU	TOCAL	LSOLUTION		ARD SOLUTION	I (S)
(LOT #): A ( P ( ) (EXP. DATE): '7 (3)	(LOT #): (EXP. DATE):	CAL. RANGE	TIME	(LOT #): (EXP. DA				RS AND EXPIRAT	
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD			CALIE	BRATE	PARAMETERS	CALIBI	RATION RANGES	(1)
010	1	WITHIN RANGE	057		pН		pH: +/- 0.	2 S.U.	
100 100	1	WITHIN RANGE	053		CC	DND	COND: +/- 1	% OF CAL. STA	NDARD
1	1	WITHIN			OF		ORP: +/- 25		
1	/	☐ WITHIN RANGE			D.(		D.O.: VARI		N.D.A.D.D.
	NOTES				—	JRB	(1) CALIBRATION	% OF CAL. STA I RANGES ARE S THE WATER QUA	PECIFIC TO
· I	PROBLEMS ENCOUNTERED					CORRECT	IVE ACTIONS		
	1 1						<i>a</i> .		
SIGNED	73/11/	<b>}</b>	-	_	HECK	ED BY	Ky	3-15	-22 DATE
GIGIND	,	DATE		C			U		J.11 L



### **WATER LEVEL DATA**

PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance	DATE: 2 26/33
PROJECT NUMBER:	464096.0000.0000	AUTHOR: Javier Jasso

NACH LOCATION I TIME I REFERENCE I MATER I BOLLOM I PRODUCT I	TROOLOT HOWBER:				///	TK, barior bacoc	<u></u>
JCW-MW-18004 (おう) TOC 13.14 14.3.2 NA NM NM JCW-MW-18006 09みう TOC 14 40 23.6 NA NM NM JCW-OW-18002 からは TOC 5.70 20.3 NA NM NM JCW-OW-18003 ある( TOC 5.70 20.3 NA NM NM JCW-OW-18004 (からむ TOC 11.1 で 14.01 NA NM JCW-OW-18006 09分う TOC 7.4 と 14.8 NA NM JCW-OW-18006 09分う TOC 7.4 と 14.8 NA NM JCW-OW-18006 09分う TOC 13.6 2 23.8 NA NM NM LH-103 04(1) TOC 13.6 2 14.0 NA NM NM MW-20 0917 TOC 7.0 14.0 NA NM NM MW-50 0514 TOC 13.6 3 14.0 NA NM NM MW-51 053 TOC 14.6 2000 NA NM NM MW-51 053 TOC 14.6 2000 NA NM NM MW-53 053 TOC 14.6 2000 NA NM NM MW-54 055 050 TOC 14.6 17.3 19.7 4 NA NM NM MW-54 055 070 14.6 17.3 NA NM NM MW-54 055 070 14.6 17.3 NA NM NM MW-54 055 070 14.6 17.3 NA NM NM MW-55 051 TOC 14.6 17.3 NA NM NM MW-55 051 TOC 14.6 17.3 NA NM NM MW-56 051 TOC 14.3 16.5 NA NM NM MW-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM NM NM-56 051 TOC 14.3 16.5 NA NM NM NM NM NM NM NM-56 051 TOC 14.3 16.5 NA NM	WELL LOCATION	TIME	REFERENCE	WATER	воттом	PRODUCT	WATER ELEVATION
JCW-MW-18004 切らう TOC 13.19 14.3 NA NM NM JCW-MW-18005 公に TOC 4.6分 16.2分 NA NM NM JCW-MW-18006 093つ TOC 14 40 23.6を NA NM NM JCW-OW-18001 6009 TOC 6:70 20.3 NA NM NM JCW-OW-18002 38 16 TOC 11.1 「19.01 NA NM NM JCW-OW-18004 65℃ TOC 7.4 を 10.6 で NA NM JCW-OW-18006 693分 TOC 13.6分 14.00 NA NM LH-103 公(1 TOC Daynage NA NM NM LH-104 690分 TOC 8.3 14.00 NA NM NM MW-20 691つ TOC 7.6 14.0 NA NM NM MW-50 分14 TOC 13.0 19.74 NA NM NM MW-51 分分 TOC 13.6 19.74 NA NM NM MW-53 あ36 TOC 14.0 20.6 NA NM NM MW-53 あ36 TOC 14.0 10.0 NA NM NM MW-54 か58 か65 TOC 14.0 17.3 NA NM NM MW-54 か65 で TOC 14.0 17.3 NA NM NM MW-54 か65 で TOC 14.0 17.3 NA NM NM MW-54 か65 TOC 14.0 17.3 NA NM NM MW-55 6月0 TOC 14.0 17.3 NA NM NM MW-56 6月0 TOC 14.3 16.3 16.3 NA NM NM MW-56 6月0 TOC 14.3 16.3 NA NM NM NM NM-58 05 TOC 14.0 17.3 NA NM NM NM NM-58 05 TOC 14.0 17.3 NA NM NM NM NM-58 05 TOC 14.0 17.3 NA NM NM NM NM-58 05 TOC 14.0 17.3 NA NM NM NM NM-58 05 TOC 14.3 16.3 NA NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM NM-58 05 TOC 14.3 NA NM NM NM NM NM NM NM NM-58 05 TOC 14.3 NA NM	JCW-MW-18001	0808	тос	17.00	23.71	NA	NM
JCW-MW-18005 8月で TOC 4.6を 16.78 NA NM NM JCW-MW-18006 0935 TOC 14 40 23.6を NA NM NM JCW-OW-18001 000 TOC 8:70 20.3 NA NM NM JCW-OW-18002 20 16 16 TOC 11.1	JCW-MW-18004		TOC			NA	NM .
JCW-MV-18006 C93つ TOC 14 40 23.68 NA NM  JCW-OW-18001 C00 TOC 6:70 20.3 NA NM  JCW-OW-18002 26 14 TOC 11.1 「19.11 NA NM  JCW-OW-18003 83 ( TOC 8 6 8 18 4	JCW-MW-18005		TOC	4.68	1628	NA	NM
JCW-OW-18001 000円 TOC 6:70 20:3 NA NM NM JCW-OW-18002 8号14 TOC 11にいて 19にいて NA NM NM JCW-OW-18003 8号1 TOC 8にも 18によ NA NM NM JCW-OW-18004 60でも TOC 7.4を (4.とい NA NM JCW-OW-18006 673万 TOC 136号 つまは号 NA NM LH-103 6代に TOC Daynage NA NM NM LH-104 690份 TOC 8元3 14にい NA NM NM MW-20 6月17 TOC 7.6と 14にい NA NM NM MW-50 6014 TOC 13に3 19には NA NM NM MW-51 60分 TOC 13に3 19には NA NM NM MW-52 60分 TOC 13を3 19に4 NA NM NM MW-53 を3と TOC 13を4 18にに NA NM NM MW-53 を3と TOC 13を4 18にに NA NM NM MW-53R を444 TOC 14にの 7.3つ NA NM NM MW-53R を444 TOC 14にの 7.3つ NA NM NM MW-54R 66分 TOC 14にの 7.3つ NA NM NM MW-55 6月0 TOC 14にの 7.3つ NA NM NM MW-58 10分 TOC 5.50 18・3・4 NA NM	JCW-MW-18006		TOC	1480	23.68	NA	NM
JCW-OW-18002 からし TOC 11にい 19には NA NM JCW-OW-18003 あるし TOC をしめ 18 色子 NA NM JCW-OW-18004 65つを TOC 7.4を ししかり NA NM JCW-OW-18006 673分 TOC 136号 つるほう NA NM LH-103 よして TOC Davacye NA NM NM LH-104 690分 TOC 多元3 14.00 NA NM MW-20 6年7 TOC 7.60 14.00 NA NM NM MW-50 6月7 TOC 13.03 19.20 NA NM NM MW-51 6分月 TOC 13.03 19.20 NA NM NM MW-52 634 TOC 13.67 19.20 NA NM NM MW-53 636 TOC 13.67 18.10 NA NM NM MW-53 636 TOC 13.67 18.10 NA NM NM MW-53 636 TOC 13.67 18.10 NA NM NM MW-53 630 TOC 14.97 18.60 NA NM NM MW-53 630 TOC 14.00 17.20 NA NM NM MW-53 630 TOC 14.00 17.20 NA NM NM MW-54R 65つ TOC 14.00 17.20 NA NM NM MW-55 6月0 TOC 14.37 16.30 NA NM NM MW-55 6月0 TOC 14.37 16.30 NA NM NM MW-55 6月0 TOC 14.37 16.30 NA NM NM MW-58 100 TOC 14.37 16.30 NA NM	JCW-OW-18001	0009	TOC		20.35	NA	NM
JCW-OW-18004 66つと TOC 7.46 (4.8 い NA NM JCW-OW-18006 とうろう TOC 1364 つままり NA NM LH-103 とはし TOC Daynaye NA NM NM LH-104 とらのも TOC もまる 14.00 NA NM MW-20 とりつ TOC 7.6 の 14.00 NA NM NM MW-50 とりし TOC 13.03 「何とせ NA NM NM MW-51 ともり TOC 13.03 「何とせ NA NM NM MW-52 ともし TOC 「ちょうる 「つって NA NM NM MW-53 ともし TOC 「ちらる 「ちらん NA NM NM MW-53R ともしり TOC 「49.1 「そんし NA NM NM MW-54R からう TOC 「49.1 「そんし NA NM NM MW-55 とりし TOC 「49.1 「そんし NA NM NM MW-55 とりし TOC 「4.10 「7.3つ NA NM NM MW-55 とりし TOC 「4.3 に 14.0 「7.3つ NA NM NM MW-55 とりし TOC 「4.3 に 14.0 「7.3つ NA NM NM MW-55 とりし TOC 「4.3 に 14.3 に 14.3 に 14.0 NM NM NM NM NM MW-58 しろ、 TOC 「4.3 に 14.3 に	JCW-OW-18002		TOC		19.41	NA	NM
JCW-OW-18006 とうろう TOC 1368 つままる NA NM LH-103 とにして TOC Davacye NA NM NM LH-104 とららも TOC もまる 14.00 NA NM NM MW-20 とりは TOC 7.00 はんい NA NM NM MW-50 といけ TOC 13.03 はらいと NA NM NM MW-51 ともり TOC はもら 19.74 NA NM MW-52 ともら TOC はもら 19.74 NA NM MW-53 ともら TOC はもら 18.00 NA NM NM MW-53R ともは TOC はもら 18.00 NA NM NM MW-54R ともら TOC はもら 14.10 にもら NA NM NM MW-54R ともら TOC はもら 14.10 にもら NA NM NM MW-55 ともし TOC はもら 14.10 にもら NA NM NM MW-55 ともし TOC はもら 14.10 にもら NA NM NM MW-55 ともし TOC はもら 14.10 にもら NA NM NM MW-55 ともし TOC はもら 14.10 にもら NA NM NM MW-55 ともし TOC はもら 14.10 にもら NA NM NM MW-58 しらら TOC ちらり TOC はもら 14.3 にもら NA NM NM MW-58 しらら TOC ちらり TOC ちらり NA NM NM NM NM-58 しらら TOC ちらり TOC ちらり NA NM	JCW-OW-18003	1831	TOC	868	1868	NA	NM
LH-103       めんし       TOC       Daymage       NA       NM         LH-104       6909       TOC       多:33       14.00       NA       NM         MW-20       6917       TOC       7.00       14.00       NA       NM         MW-50       6914       TOC       13.03       19.00       NA       NM         MW-51       500       TOC       14.00       20.00       NA       NM         MW-52       600       TOC       15.03       19.74       NA       NM         MW-53       600       TOC       13.64       18.10       NA       NM         MW-53R       600       TOC       14.0       17.00       NA       NM         MW-54R       600       TOC       14.0       17.00       NA       NM         MW-55       6910       TOC       14.3       16.3       NA       NM         MW-58       100       TOC       5.50       18.0       NA       NM	JCW-OW-18004	1.0	тос	7.48	14.81	NA	NM
LH-103       びはして TOC       Darmage       NA       NM         LH-104       8908       TOC       多33       14.00       NA       NM         MW-20       6917       TOC       7.60       14.00       NA       NM         MW-50       6014       TOC       13.03       19.00       NA       NM         MW-51       0631       TOC       14.00       20.00       NA       NM         MW-52       6034       TOC       15.33       19.74       NA       NM         MW-53       6036       TOC       13.64       18.10       NA       NM         MW-53R       5044       TOC       14.97       18.60       NA       NM         MW-54R       6657       TOC       14.10       17.30       NA       NM         MW-55       6910       TOC       14.3       16.30       NA       NM         MW-58       103       TOC       5.50       18.30       NA       NM	JCW-OW-18006	0935	TOC	1268	23.48	NA	NM
LH-104       8900       TOC       833       14.00       NA       NM         MW-20       6月7       TOC       7.60       14.00       NA       NM         MW-50       6月4       TOC       13.03       19.40       NA       NM         MW-51       6月4       TOC       14.00       20.60       NA       NM         MW-52       6月4       TOC       19.33       19.74       NA       NM         MW-53       6月5       TOC       13.64       18.16       NA       NM         MW-53R       6月4       TOC       14.0       18.60       NA       NM         MW-54R       6月5       TOC       14.0       17.30       NA       NM         MW-55       610       TOC       14.3       16.30       NA       NM         MW-58       100       TOC       5.50       18.00       NA       NM	LH-103	oqu	TOC		re	NA	NM
MW-20       6917       TOC       7.6 リ し し し し い い い い い い い い い い い い い い い	LH-104	808	тос	1		NA	NM
MW-51       の分月       TOC       14(4を) 20.00       NA       NM         MW-52       6034       TOC       15.33       19.74       NA       NM         MW-53       6836       TOC       13.64       18.14       NA       NM         MW-53R       5844       TOC       14.91       18.80       NA       NM         MW-54R       6657       TOC       14.10       17.37       NA       NM         MW-55       890       TOC       14.31       16.34       NA       NM         MW-58       1031       TOC       5.50       18.34       NA       NM	MW-20		TOC	7,00	14.00	NA	NM
MW-51       のも月       TOC       14(14)       20.00       NA       NM         MW-52       のか月       TOC       1533       19.74       NA       NM         MW-53       低36       TOC       1364       18.14       NA       NM         MW-53R       砂44       TOC       14.91       18.64       NA       NM         MW-54R       砂57       TOC       14.10       17.37       NA       NM         MW-55       890       TOC       14.31       16.34       NA       NM         MW-58       103       TOC       5.50       18.34       NA       NM	MW-50	0014	тос	13.63	19:40	NA	NM
MW-53       仮36       TOC       1364       18.14       NA       NM         MW-53R       砂はり       TOC       14.47       18.60       NA       NM         MW-54R       砂55       TOC       14.10       (7.35)       NA       NM         MW-55       690       TOC       14.3        16.3        NA       NM         MW-58       103        TOC       5.50       18.10       NA       NM	MW-51		тос	14.60	20.00	NA	NM
MW-53       仮36       TOC       1364       18.14       NA       NM         MW-53R       砂はり       TOC       14.47       18.60       NA       NM         MW-54R       砂55       TOC       14.10       (7.35)       NA       NM         MW-55       690       TOC       14.3        16.3        NA       NM         MW-58       103        TOC       5.50       18.10       NA       NM	MW-52	mag	TOC	1523	19.74	NA	NM
MW-53R かいし TOC 14.10 17.3つ NA NM MW-54R からうう TOC 14.10 17.3つ NA NM MW-55 と910 TOC 14.3~ 14.3~ 14.3~ NA NM MW-58 10分~ TOC 5.50 14.3~ NA NM	MW-53		TOC	1389	18.66	NA	NM
MW-54R       のもち)       TOC       14.10       (フ.) つ       NA       NM         MW-55       6910       TOC       14.3 ご       14.3 ご       NA       NM         MW-58       100       TOC       5.50       14.3 ご       NA       NM	MW-53R		тос	<del></del>		NA	NM
MW-55 890 TOC 14.3: 16.38 NA NM MW-58 103: TOC 5.50 18.38 NA NM	MW-54R	<i>(65)</i>	TOC	14.10		NA NA	NM
MW-58 103 TOC 5.50 18.34 NA NM	MW-55	6910	тос			NA	NM
	MW-58		TOC	5.50	18.24	NA	NM
	OW-51		TOC	10.24	T-1	NA	NM
OW-53 0837 TOC 8.36 1800 NA NM	OW-53	0837	тос	8.36	1800	NA	NM
OW-54 0833 TOC 7.62 1646 NA NM	OW-54		тос		1648	NA	NM
OW-55 0911 TOC 5.63 18.42 NA NM	OW-55	0911	тос	- " -	18.42	NA	NM
OW-56R 694 TOC 569 20.33 NA NM	OW-56R	oray	TOC	5.69	20.57	NA	NM

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).  $\Lambda$ 

IGNED 3 ( ( ) ) DAT

CHECKED

5-15-22

DATE



### **WATER LEVEL DATA**

PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance	DATE: 2/26/27
PROJECT NUMBER:	464096.0000.0000	AUTHOR: Javier Jasso

TROSECT NOMBER.	+0+050.000			Aomo	11. 001101 00000	
WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-57 IN	0935	TOC	697	19648	NA	NM
OW-57R IN	0436	TOC	6.74	2014	NA	NM
OW-57 OUT	0934	TOC	10.7	1928	NA	NM
OW-57R OUT	0933	TOC	990	20:30	NA	NM
OW-61	0945	TOC	13.24	26.24	NA	NM
OW-63	<i>ও</i> (५)	тос	Me to la	chign for	ing NA	NM
JCW-MW-15030	0633		१७३४	MNA		
Jume 15 ac	our co		14.70	Dwm		
nuile a	8854		1468	Dum		
Jeco Bulboay	Gar		7.45	14.6		
Jan Mu-15031	3904		1991	DNW		
06.54	6935		6.50	19.27		
mw-19	10.10		4.35	70.38		
MU-15008	(0)		453	17.40		
MW-15020	1099		509	けいり		
nu lles	1024		495	32.76		
MW-15074	1030		6.03	17.17		
MW 15019	1032		5.75	16.61		
MW-15018	1035		5.85	9.94		
Mw-15002	1039		6-80	16.66		
MW-12001	1040		8.90	DWW		
mw-1500	643		3.90	\$1002er		
		1				

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED DATE

CHECKED My

3-15-22

DATE

<b>&lt;&gt;</b>	TRC
	—

PROJECT	NAME	Ξ:	CEC W	/eadock LF:	2022 GW C		PRE	EPARED			CHEC	KED
PROJECT	NUM	BER	: 464096	3.0000.0000		BY:	JJ	DATE:3/11	וכלו	BY: 💍	K	DATE:3-15-22
SAMPLE ID: ) CU Ma (SOO ( WELL DIAMETER: 2" 4" 6" OTHER												
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER												
SAMPLE TYPE:												
PURGING TIME (6) DATE: 3/7/2) SAMPLE TIME: (54 DATE:3/7/2)												
PURGE		V I	PUMP	PERISTALTI	CPUMP			s	u co		тү: <u>29</u>	€ J umhos/cm
METHOD: ☐ BAILER ORP: ~ mV DO: 1-0-3 mg/L												
DEPTH TO WATER: 17.01 T/ PVC TURBIDITY: 1.9 MTU												
DEPTH TO	ВОТТ	OM:	7	T/ PVC			12 401		GHT	МО	DERATE	☐ VERY
WELL VOL	UME:		NA	LITERS	GALLO	NS	TEMPE	TOTTOTILE		°C OT⊦	HER:	40.14
VOLUME F	REMOV	ED:	<u> </u>	LITERS	GALLO		COLOF	: <u>(</u> .[.(4	W	OD		1016
COLOR:		_(	OV 1	4 (	DDOR: MO	<u>_</u> _	FILTRA	TE (0.45 um)	YES	s #	-NO	
_				BIDATY				TE COLOR:			TRATE ODO	)R:
NONE		SLIC		MODERATE	<b>Ø</b> VE		<del>                                     </del>	MPLE: 🔼 MS	/MSD		DUP-	
DISPOSAL	METH	IOD:	✓ GROUN	ID DRU	M 🗌 OTHEF	₹	СОММ	ENTS:				
TIME	PURG	- 1	PH	CONDUCTIVI	TY ORP		D.O.	TURBIDITY	TEMP	ERATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME
	(ML/M	- 1	(SU)	(umhos/cm)	(mV)		( mg/L)	(NTU)		(°C)	(FEET)	(GAL OR L)
004	DU	)	y.cec	,2946	-38.0	9	30	<b>B</b> O-7.	8	)	170	INITIAL
5624			673	2477	ーロカイ	<u> </u>	71	200	(0)	<u>(</u>	1710	
1699			679	3044	-1700		19	Tic	10.	7	1710	7
1434			6.80	3011	~180.	7 1	.08	130	10.	6	1715	13
0639			(085	3044	-190	01	07	2.70	10	U	17/1	4
1644			60	3030	199.0	3 10	oc	2.20	10	> 3	1710	5
0049		$\neg \uparrow$	(a.E.)	2995	- 194		03	1.95	10	Ý	17/1	(-
0254				298)	- 200	,	03	195	10	24	471	-
		$\neg$										
NC	TE: 61	FA DII	LIZATION	EST IS COM	IDI ETE WILE	138110	CESSIVI	E READINGS A	DE WIT	THIN THE	FOLLOWIN	IG LIMITS:
pH: +/-			COND.: +/-		P: +/- <b>10</b>		: +/- 0.3			or =</td <td></td> <td>TEMP.: +/-</td>		TEMP.: +/-
BOTTLES	S FILLE	D	PRESERV	ATIVE CODE	S A - NONE	В	- H <b>N</b> O3	C - H2SO4	D -	NaOH	E - HO	CL F
NUMBER	SIZI	E	TYPE	PRESERVA	TIVE FILT	ERED	NUMBI	ER SIZE	TYF	PE PF	RESERVAT	IVE FILTERED
(0	125	,	GIASI	A	□ Y	Z-N						□ Y □ N
Ĭ	25	U	D(	A	ΠY	<b>₽</b> N						□ Y □ N
3	120		pi	jA-		□ N						□ Y □ N
ž	13		31	B		N						□ Y □ N
	<del>_</del>		( <u>`</u>		□ Y	N						□ Y □ N
SHIPPING	METH	OD:	iab dr	off	DATE SHIPP	ED:	3-10	-22	AIF	RBILL NUM	/BER:	
COC NUMI		***********			SIGNATURE:				DA	TE SIGNE	:D:	
								$\rightarrow$		WHEN A GOLD A.	<del></del>	+/

## ♦ TRC

PROJEC1	NAME:	CEC V	Veadock LF: 2	022 GW C	PR	EPARED		СН	ECKED
PROJEC1	NUMBE	R: 46409	6.0000.0000	BY:	JJ	DATES	D) BY:	3K	DATE:3-15-22
SAMPLE ID: JCW MW- (8004 WELL DIAMETER: 2" 4" 6" OTHER									
WELL MAT	ERIAL:	✓ PVC	ss 🗆	IRON GA	LVANIZED S	STEEL	□ o <sup>-</sup>	THER	
SAMPLE TYPE:									
PUR	GING	TIME:)	3/ DA	TE:3/7/22	`	AMPLE	TIME		DATE 3/7/3 )
PURGE PUMP PERISTALTIC PUMP  PH: 49 SU CONDUCTIVITY: 49 umhos/cm  METHOD: BAILER  ORP: 75 W mV DO: 49 mg/L									
DEPTH TO WATER: 13.15 T/ PVC TURBIDITY: 2.9C NTU									
	D BOTTOM	1.6.5	T/ PVC				 GHT [	] MODERAT	E VERY
WELL VOL		NA	LITERS	GALLONS	TEMPE	RATURE:	3.C ∘c	OTHER:	
VOLUME	REMOVED	20	LITERS	GALLONS	COLO		ow	ODOR:	2010
COLOR:		Clov	QG OD	OR: M	FILTRA	ATE (0.45 um)	YES	, NO	
	•		BIDITY			TE COLOR:		FILTRATE	ODOR:
NONE	☐ SL		MODERATE	VERY		MPLE: MS	/MSD	DUP-	
DISPOSAL	L METHOD	GROU	ND DRUM	OTHER	COMM	MENTS:			
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERA	I LEVI	EL PURGE VOLUME
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)		
0731	100	6.19	1811	= KUGIL	10.0	50.0	4.9	13,1	\ <u></u>
0736		6.75	1757	30.0	60	2270	44	134	
6741		695	1664	-50	5.50	6.70	U. F	137	0 (
6746		(O-C)	1678	-25.0	SOC	30	3,7	139	¢ 1. ^
0791		Cac	1691	っついう	4.99	295	36	140	
0756		6.90	1691	->5.8	499	290	3.6	141	7 2,
080-1									3
					<u> </u>				
	/		TEST IS COMPL						
pH: +/-	0.1	COND.: +/-	3 % ORP:	+/- 10	D.O.: +/- <b>0.3</b>	TURB: +/-	<b>10</b> % o	r = 10</td <td>TEMP.: +/-</td>	TEMP.: +/-
	S FILLED		ATIVE CODES		B - HNO3		г :	<u> </u>	- HCL F
NUMBER		TYPE	PRESERVATI			SER SIZE	TYPE	PRESER\	VATIVE FILTERED
1	125	9/112	A						
_(	1) [	<u> </u>	1		N				
	250	191	<i>A</i>		N				
( 1) L 51 B									
					N				□ Y □ N
SHIPPING	METHOD:	Ing Do	op oft Di	ATE SHIPPED:	3-10	-27	AIRBIL	L NUMBER:	
COC NUM	BER:	*	SI	GNATURE:		$\supset$	DATE	SIGNED: -3	14/31
L					0	1		<b>V</b>	11/1 -

## ◆ TRC

DDO JECT N	A N A IT.	- CEC IA	Jandada I F. 20	222 CIVI C	DD	EDADED		CLIEC	VED
PROJECT N.			Veadock LF: 20			EPARED .		CHEC	
PROJECT N			5.0000.0000	7-0M-180 BX:		DATE:カ		5k	DATE:3-15-22
SAMPLE ID:	<del>364</del>	) - Ou	, SAY	WELL DIAM	ETER: 🔽	2"	6" □ OT⊦	IER	
WELL MATER	IAL:	☑ PVC	ss 🗆	IRON GAL	VANIZED S	STEEL	□ от⊦	IER	
SAMPLE TYPI	E: [	য GW	□ ww □	SW DI		LEACHATE	□ от⊦	IER	
PURGIN	NG	TIME:	IT DA	TE:3/フ/ひ <i>み</i>	S	AMPLE	TIME: O	ui D	ATE:3/7/0)
PURGE METHOD:		PUMP BAILER	PERISTALTIC F	PUMP	PH:	<u>715</u> s <del>-</del> 65.8 m	U CONDUC	3,50 mg	) <u>()</u> umhos/cm
DEPTH TO W	/ATER:	7.16	T/ PVC		TURBI	DITY: 1.4つ	NTU		
DEPTH TO B			T/ PVC		П по		GHT 🔲	MODERATE	☐ VERY
WELL VOLUM		NA NA	LITERS	GALLONS	TEMPE	RATURE: S	. (. °c	OTHER:	***************************************
VOLUME REI			LITERS	GALLONS	COLO		7		0N
COLOR:		100/	OD	DR: non		TE (0.45 um)	YES	NO	
		TURI	BIDITY	<del>- 10                                   </del>		TE COLOR:		FILTRATE ODG	DR.
NONE	SLIC		MODERATE	☐ VERY			/MSD	DUP-	
DISPOSAL M	ETHOD:	<b>∄-</b> GROUN	ND 🗌 DRUM	OTHER	COMM	IENTS:			
	URGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERATU	JRE WATER	CUMULATIVE PURGE VOLUME
	/IL/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)
0015 1	40	739	1570	9,0	11.0	(0,0)	4.3	716	INITIAL
0670		7.09	1577	-200	4.16	1.95	53	3.10	. [
0675		7.11	1574	-500	3.60	0عا.١	S.3	895	1
0830		7.14	1577	ينوه	3.50	1,50	5-3	9,90	l, î
0631	1	714	(57)	-65.0	3.49	1.56	5. 3	990	7
UE 4c		7.15	1576	-65.3	3.49	1.49	5. 3	10.0	2,
0845		7.15	1976	-45.8	3.5Ú	L43	51	1018	3
		,							
					.,,				
NOTE	- STADII	IZATION T	EST IS COMPI	ETE WHEN 2 S	IICCESSIV	E DEADINGS A	DE WITHIN 1	THE FOLLOWIN	IC LIMITS:
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.: +/-</td									
BOTTLES F	ILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaOl	H E-HC	CL F
NUMBER	SIZE	TYPE	PRESERVATIV	/E FILTEREI	NUMB	ER SIZE	TYPE	PRESERVAT	IVE FILTERED
2 (	ハ	91151	P)	口丶炉	N				□ Y □ N
1 2	50	DI	A		N				□ Y □ N
	25	01	A		N				□ Y □ N
'	) (	51	B		N				OY ON
	•				N			-	U Y U N
SHIPPING ME	THOD:	ab Da	DA OPO DA	TE SHIPPED:	3-10	-22	AIRBILL	NUMBER:	
COC NUMBER				SNATURE:		$\overline{}$	DATE SI		11/2
				2, 2, 11 OILE.	$-\!$	-		<del></del>	#/

<b>&lt;&gt;</b>	TR	C
-----------------	----	---

PROJECT NAME:	CEC V	Veadock LF: 20	22 GW C	PRI	EPARED		CHEC	KED
PROJECT NUMBE	R: 464096	3.0000.0000	BY:	JJ	DATE	133 BY:	2×	DATE:3-15-22
SAMPLE ID: M	w 5 5	7	WELL DIAM	METER: 🗸	2"	6" ☐ OTHE	R	
WELL MATERIAL:	☑ PVC	ss 🔲	IRON 🗌 GAI	LVANIZED S	STEEL	ОТНЕ	R	
SAMPLE TYPE:	☑ GW	□ ww □:	sw 🗌 di		LEACHATE	OTHE	ER	
PURGING	TIME: CC	(03 DA	re: <i>3/7/</i> シ	S	AMPLE	TIME: 094		でシング
PURGE  METHOD:	PUMP BAILER	PERISTALTIC P	UMP	PH: °	<i>7,12</i> s -139. <b>5</b> m	U CONDUC	TIVITY: 14°	umhos/cm
DEPTH TO WATER:	14.30	T/ PVC		TURBI	DITY: 29	NTU		
DEPTH TO BOTTOM	: Nm	T/ PVC		<del>∏</del> -N⊖I	NE SLI	GHT []	MODERATE	☐ VERY
WELL VOLUME:	NA	LITERS [	GALLONS	TEMPE	RATURE:	e.C <sub>°C</sub> (	OTHER:	
VOLUME REMOVED	·	LITERS [	GALLONS	COLO	ج: <u>ل</u> ر	200	ODOR:	ONO
COLOR:	Arcus	S) ODO	OR: <b>500</b>	FILTRA	TE (0.45 um)	☐ YES ,	ZÎ NO	
	<del></del>	BIDITY		FILTRA	TE COLOR:		FILTRATE ODC	PR:
☐ NONE ☐ SL		MODERATE	☐ VERY		MPLE: MS	/MSD	DUP-	
DISPOSAL METHOD	:GROUI	ND 🗌 DRUM	OTHER	COMM	ENTS:			
TIME PURGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERATUR	RE WATER LEVEL	CUMULATIVE PURGE VOLUME
(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)
0903 24	スベ	678	-7.3	ない	20 <i>0</i>	4.8	14.50	INITIAL
6908	7.21	1394	-70.5	3.67	250.U	<b>ろ. 3</b>	14.30	1.0
0913	7.12	14.29	-110.0	153	43.	(o = C)	14323	20
0918	711	1435	-1300	1.33	30.	5.9	1477	3.0
0913	7.11	1443	-140.0	1.20	12.60	60	1435	90
0926	5/13	1450	-140.	7.20	60	آو. <i>ن</i>	1495	5,0
0933	7.13	1450	-1345	1.16,	3.0	6.0	14.37	(B.()
0938	7.10	1450	-139.5	1.14	3-0	6.0	1471	フ
0943	7,13	1453	-139.5	1.16	२५८	6.0	1475	ع
NOTE: STAE	BILIZATION T	TEST IS COMPL	ETE WHEN 3 S	SUCCESSIV	E READINGS A	RE WITHIN TI	HE FOLLOWIN	G LIMITS:
pH: +/- <b>0.1</b>	CO <b>N</b> D.: +/-	3 % ORP:	+/- 10	0.O.: +/- <b>0.3</b>	TURB: +/-	<b>10</b> % or	= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-
BOTTLES FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaOH	E- HC	L F
NUMBER SIZE	TYPE	PRESERVATIV			ER SIZE	TYPE	PRESERVATI	VE FILTERED
2 137	9/19	A		N				
1 250	PI	A		N				□ Y □ N
1 100	16	/4	□ Y <b>Æ</b>	N				
767	121	3		N				□ Y □ N
	<b> </b>			N				□ Y □ N
SHIPPING METHOD:	lab i	DA OFF DA	TE SHIPPED:	3-10	)-22	AIRBILL	IUMBER:	<u> </u>
COC NUMBER:	<u> </u>		SNATURE:			DATE SIG	SNED:	111/12
	_===			-//	1		<del></del>	<del>                                     </del>

<b>&lt;&gt;</b>	TR	C

PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED								CHECKED		
PROJECT I	NUMBEF	R: 46409	6.0000.0000	BY:	JJ	DATE ?)	1 2 BY:	JK	DATE: 3-15-22	
SAMPLE ID	D: ()	5	5	WELL DIAM	ETER: 🗸	2"	6" OT	HER		
WELL MATE	RIAL:	☑ PVC	ss 🗆	IRON GAL	VANIZED S	STEEL	🗆 от	HER		
SAMPLE TY	PE:	☑ GW	□ ww □	SW 🗌 DI		LEACHATE	ОТІ	HER		
PURG	ING	TIME: 10	OQ DA	TE: 2/7/2:	) S	AMPLE	TIME ( C	<i>z i</i>	DATE:3/7/00	
PURGE METHOD:										
DEPTH TO WATER: 5.48 T/ PVC TURBIDITY: 20-0 NTU										
	DEPTH TO BOTTOM:   DUD T/ PVC									
WELL VOLUI		NA NA	LITERS	GALLONS	—//\	······································	~ }~°C	OTHER:		
VOLUME RE	EMOVED:	4.0	LITERS	GALLONS	COLO	R: Clea		+	010	
COLOR:		CONAL	<b>↓</b> OD	OR: <b>101</b>	. FILTRA	TE (0.45 um)	YES	NO		
		TUR	ВІРІТҮ		FILTRA	TE COLOR:		FILTRATE C	DDOR:	
NONE	SLI	GHT 🗌	MODERATE	VERY	QC SA	MPLE: MS	/MSD	DUP-		
DISPOSAL N	DISPOSAL METHOD: GROUND DRUM DTHER COMMENTS:									
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERAT	URE WATE		
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	LEVE (FEET		
1000	OP	7.57	1091	-lole-7	10.0	800	38	5.48	NITIAL	
1011		7-53	1200	-7911	251	730	4,7	6.70	0 ,5	
1016		7.50	1204	-90-0	97	320	4.7	213		
1021		フ.4つ	13[]	-99.5	1.50	E4.0	40	77	6 1.1	
1026		744	1222	-110.0	1.46	380	46	80	2	
1031		7.44	13)6	-110.5	1.40	29.0	5.0	801	1 25	
1036		740	12-37	-116.V	130	20.0	50	BR	7 3	
1041		7.40	1247	-119.8	1:30	20.0	5.1	9.0		
1046		Zuc	1251	-120.0	1,30	20.0	5.1	939	4 4	
1051		7.40	1256	-120.5			5.2	9.12		
	E: STABI		-	ETE WHEN 3 SU				THE FOLLOW		
pH: +/- <b>0.</b>	.1 (	COND.: +/-	3 % ORP:	+/- <b>10</b> D.6	D.: <b>+/- 0.3</b>	TURB: +/-	<b>10</b> % or	= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-	
BOTTLES F	FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaO	H E-	HCL F	
NUMBER	SIZE	TYPE	PRESERVATIV	/E FILTERED	NUMB	ER SIZE	TYPE	PRESERVA	ATIVE FILTERED	
21	16	9/955	A		N				ПΑПИ	
ā	250	<b>p</b> (	A		V				□ Y □ N	
	75	PI	A		V				□ Y □ N	
	125	PI	В		V				O Y O N	
					V				П Л П И	
SHIPPING METHOD: lab Drop of DATE SHIPPED: 3-10-22 AIRBILL NUMBER:										
COC NUMBE	COC NUMBER: SIGNATURE: DATE SIGNED: 3/1/2)									
JACOBALL STATE										

<b>&lt;&gt;</b>	TRC
•	

PROJECT NAME: CEC Weadock LF: 2022 GW C					PREPARED			CHECKED		
PROJECT NUMBER	E	BY:	JJ	DATE:3	10 Y	BY: 5	ik.	DATE: 3-15-22		
SAMPLE ID: JOW	Mw	18005	WELL D	IAMET	ER: 🔽	2"	6" 🔲	OTHER		
WELL MATERIAL;	☑ PVC	ss 🗆	IRON 🔲 G	SALVAI	NIZED S	TEEL		OTHER		
SAMPLE TYPE:	☑ GW	□ ww □	SW 🗆 E	DI		LEACHATE		OTHER		
PURGING	3/7/3)									ATE:3/7/27
METHOD:	PUMP BAILER	PERISTALTIC F	PUMP		~~~~	7.09 s -108.5 m			146 29 mg	
DEPTH TO WATER: 4,40 T/ PVC TURBIDITY: 140 NTU										
DEPTH TO BOTTOM:_	NM	T/ PVC			MOI	NE 🗌 SLI	GHT	□ мо	DERATE	☐ VERY
WELL VOLUME:	NA	LITERS	GALLON	s	TEMPE	RATURE: 6	),(	с отн	IER:	
VOLUME REMOVED:	5.5	. LITERS	GALLON	s	COLOF	Car	V	ODO	DR: 10	No
COLOR:	van	OD OD	OR: NON	$\varphi$	FILTRA	TE (0.45 um)	YES	A	NO	
		BIDITY	-	1	FILTRA	E COLOR:		FIL	TRATE ODC	DR:
□ NONE □ SLIG	нт 🗌	MODERATE	-VER	Y	QC SA	MPLE: MS	MSD	#	DUP 4	-f-
DISPOSAL METHOD:	GROUN	ID 🗌 DRUM	OTHER		COMM	ENTS:		Dob	~Jcw-	LF-01
TIME PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)		D.O. mg/L)	TURBIDITY (NTU)		RATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME
	729	1375	- 75.7		2.0	700	6.0	C)	GEET)	(GAL OR L) INITIAL
	7.13	1353	-91-9	15						
	-11		94.	1	72	400	(0.0		9.90	<u>, ,,                                  </u>
1131	7.11	1349			63	1(00	60		100	
	711	1341	980	12	(G)	Sic	59		16.10	1.1
114	611	1336	-1000		0)	50,0		9	1015	
1190	7.13	1339	-106.5		49	38.7	5.		1011	2,5
	7.10	1342	-106.8		48	220	6.0	,	1017	3
	7.10	1340	-1070		18	20.0	61		Ole	3,1
	7.09	1364	-1075	(.	36	15.0	(a)	).	1071	4
1210 1	709	1388	-1080	le	30	1490	(al		1073	4,5
NОТЕ:\sтавіLi pH: +/- 0.1 СС	<b>IZATION T</b> OND.: +/-		ETE WHEN 3 +/- 10		ESSIVE	E <b>READINGS A</b> TURB: +/-		IIN THE F		G LIMITS: TEMP.: +/-
BOTTLES FILLED P	RESERVA	ATIVE CODES	A - NONE	B -	HNO3	C - H2SO4	D - N	NaOH	E- HC	L F
NUMBER SIZE	TYPE	PRESERVATIV	/E FILTER		NUMBE		TYPE		ESERVATI	
4 Hon a	ilaci	A		2 N						
250	2 (	A		A N						
2 125	70	<del>1</del> 1	<del>-   -   -   -   -   -   -   -   -   -  </del>	A N						OY ON
	n (	B	<u>_</u>	3- N						
	<u> </u>	<u> </u>		] N						
SHIPPING METHOD:	lab D	AD SON DA	TE SHIPPED	;	J~W~	22	AIRE	BILL NUMI	BER:	
COC NUMBER:			SNATURE:			<u> </u>		E SIGNED		
DATE SIGNED.										

## **?**TRC

### WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Weadock LF: 2022 GW Co		PREF	PARED		CHEC	KED
PROJECT NUMBER:	464096.0000.0000	BY:	ำา	DATE:3/11/20	BY:	JK	DATE: 7-15-22

SAMPLE ID: JCW-MW-16005

	- 50	40 111	0.1000						
TIME	PURGE RATE	PH	CONDUCTIVITY		D.O.	TURBIDITY	TEMPERATURE	WATER	CUMULATIVE PURGE VOLUME
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)
1915	100	709	1401	-108.1	1.30	14.0	6	1075	5
1270		7.09	1470	-188.5	1.29	14.0	Cel	10)1	5.
					<b>_</b>		<u> </u>		
	<del>  </del>	<u> </u>			<del> </del>				
	<del>  </del>				ļ				
	\ \								
And the second s									
	<b></b>				<del> </del>				
	<u> </u>		<u> </u>		<del> </del>	er entrem had in his bard to mile it and a service and described to the se			
	ļ				·				
		<u> </u>			<del> </del>		<u> </u>		
	<b> </b>				<del> </del>		<u> </u>		
****	ļ						<u> </u>		
					<del> </del>				
								1	
	ļ		<u> </u>		ļ		<b></b>		<u> </u>
	<del> </del>							<b> </b>	
	<del> </del>		<u> </u>				<b> </b>	<del> </del>	
	ļ							<u></u>	-
				1			<u> </u>	1	
					<del> </del>		<del> </del>	<del> </del>	
ļ	<u> </u>			ļ	-		-	<u> </u>	
							<u> </u>		
		<del> </del>					***************************************	<del></del>	

SIGNATURE:

3/11/99

DATE SIGNED:

**REVISED 04/2019** 

<b>&lt;&gt;</b>	TR	C
		•

PROJEC	PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED								
PROJEC	T NUMBE	R: 46409	96.0000.0000	BY:	JJ	DATE:	() BY:	JK	DATE 3-15-22
SAMPLE	ID: Ju	J. Mu	16000	WELL DIAM	∕IETER: ✓	2"	6" 🗌 ОТ	HER	
WELL MA	TERIAL:	✓ PVC	□ ss □	] IRON   GAI	VANIZED	STEEL	□ от	HER	
SAMPLE 1	ΓΥΡΕ:	☑ GW	□ww □	] SW □ DI		LEACHATE	□ от	HER	
PUR	GING	TIME: 1	)५) ।	DATE: '3 17/2	) S	SAMPLE	TIME: (3	12 [	DATE 7/37
PURGE METHO		PUMP BAILER	PERISTALTIC	PUMP	PH: ORP:	10.75	SU CONDU	-00	umhos/cm
DEPTH T	DEPTH TO WATER: YOUNG TURBIDITY: 17 PVC TURBIDITY: 1.75 NTU								
DEPTH T	о воттом	:_ NM	T/ PVC		A_nc	NE SL	GHT 🔲	MODERATE	☐ VERY
WELL VOL	LUME:	ŊA	LITERS	GALLONS	TEMP	ERATURE:	? <u>`</u> ) ∘c	OTHER: _	
VOLUME	REMOVED	<u>ب ک</u>	LITERS	GALLONS	COLO	R:	QC/	ODOR: 1	10K
COLOR:		Clos		DOR: 1010	_ FILTR/	ATE (0.45 um)	YES	-NO	
_			BIDITY		FILTRA	TE COLOR:		FILTRATE OF	OOR:
NONE	<del></del>		MODERATE	☐ VERY	QC SA	AMPLE: MS	/MSD	DUP-	
DISPOSA	L METHOD	GROU	ND DRUM	/ OTHER	COM	MENTS:			
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVIT		D.O.	TURBIDITY	TEMPERAT	LEVEL	PURGE VOLUME
1247	icu	736)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)  // INITIAL
1247	1	7.14	1385		10.0	27.0	90	14.64	
			1350	-119.	2017	3.0	7.1		
1227	<b></b>	7.08	1351	-1361	1.39	2.30	7.4	1478	
1257		7.08	1366	-1400	1,00	しつつ	7.0	1480	3
1307		7.09		-150.5	1.00	(78	76	1480	<u> </u>
1367	()	7.69	1380	-151.0	1.00	175	7.7	1480	, 7
1312	0	7.09	1385	-1515	O19	1.71	7.7	14.80	V V
			L.						
						1			
NC pH: +/-		LIZATION TO COND.: +/-		PLETE WHEN 3 S P: +/- 10 D.	UCCESSIV				
BOTTLES			ATIVE CODES	<del> </del>	B - HNO3			= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-
NUMBER	SIZE	TYPE	PRESERVAT			C - H2SO4 ER SIZE	D - NaOl TYPE	H E - H PRESERVAT	
2	70	Colles	A		N N	LIK OIZE		FILISLINA	DY DN
1	250		Λ.						
<del></del>		<u> </u>	Λ		N N				
-	121	71	B					<del> </del>	
	(0)	(			N				
		1 1 1	00					<u></u>	
SHIPPING	METHOD:	hb D	nop off c	ATE SHIPPED:	3-10	-37	AIRBILL	NUMBER:	
COC NUME	3ER:		s	IGNATURE:	$\int$	\	DATE SI	GNED: 3	11/1

<b>&lt;&gt;</b>	TR	C
_		_

PROJECT NAME:	CEC Weadock L	F: 2022 GW C	PREPARED		CHECKED			
PROJECT NUMBER	R: 464096.0000.000	00 BY:	JJ DATE:3\1	)) BY: 3	DATE: 3-15-22			
SAMPLE ID:	W. 59/	WELL DIAMET	ER: 🗸 2" 🗌 4" 🗍	6" OTHER				
WELL MATERIAL:	✓ PVC SS	☐ IRON ☐ GALVA	NIZED STEEL	OTHER				
SAMPLE TYPE:	SAMPLE TYPE:  GW WW SW DI LEACHATE OTHER							
PURGING	TIME: 34	DATE: 3/2/3)	SAMPLE		DATE: 3/7/3)			
PURGE METHOD:	PUMP PERISTAL BAILER	TIC PUMP			umhos/cm			
DEPTH TO WATER:	5.UL T/ PVC		TURBIDITY: 6-8	3CNTU				
DEPTH TO BOTTOM	DEPTH TO BOTTOM: T/ PVC							
WELL VOLUME:	NA LITERS		TEMPERATURE:	€7 с от⊦	HER:			
VOLUME REMOVED:	_	GALLONS	COLOR: Clu	ODC ODC	OR: NOVO			
color: Dark	Brown	ODOR: 1016	FILTRATE (0.45 um)	☐ YES 🔏	NO			
	TURBIDITY	A.,	FILTRATE COLOR:	FIL.	TRATE ODOR:			
	GHT MODERAT	<i></i>	QC SAMPLE: MS	/MSD 🗌	DUP-			
DISPOSAL METHOD:	GROUND   DR	UM  OTHER	COMMENTS:					
TIME PURGE RATE	PH CONDUCTIV	VITY ORP	D.O. TURBIDITY	TEMPERATURE	WATER CUMULATIVE LEVEL PURGE VOLUME			
(ML/MIN)	(SU) (umhos/ci	m) (mV) (	mg/L) (NTU)	(°C)	(FEET) (GAL OR L)			
1341 200	7.50 1603	-10.1	2000	4.8	600 INITIAL			
1346	721 160	-96cl 2	164 24.00	6.1	5.40			
1351	7/7 1550		48 (080	3.9	545 3			
1356	7.18 1503		30 6.85	5.7	540 3			
1401	718 1500		30 680	5.7	541 6			
1404	718 1500		38 686	5, つ	541-			
ILH-					545			
1416					541 7			
					(a)			
NOTE: STARI		MDI ETE MUEN A OUG	05000/5 05400400					
			CESSIVE READINGS A +/- 0.3 TURB: +/-					
<u> </u>								
	PRESERVATIVE COD		HNO3 C - H2SO4	— т	E - HCL F			
NUMBER SIZE	TYPE PRESERV		NUMBER SIZE	TYPE PR	RESERVATIVE FILTERED			
2 125	9/ASI A							
1 250	Pt A							
191	P( A	□ Y · T N						
1 1)	PI B	□ Y Ø N						
		□ Y □ N						
SHIPPING METHOD:	las Drop off	DATE SHIPPED:	3-10-22	AIRBILL NUM	BER:			
COC NUMBER:		SIGNATURE:		DATE SIGNE	D: 3/1/11			
					<del></del>			

*> TRC	<b>&lt;&gt;&gt;</b>
--------	---------------------

PROJECT NA	ME:	CEC V	Veadock LF: 2	022 GW C	PR	EPARED		CHE	CKED
PROJECT NU	JMBEF	R: 46409	6.0000.0000	BY:	JJ	DATE (1)	)) BY:	51L	DATE: 7-15-21
SAMPLE ID: NU. WELL DIAMETER: 2" 4" 6" OTHER									
WELL MATERI	WELL MATERIAL:  PVC SS IRON GALVANIZED STEEL OTHER								
SAMPLE TYPE:									
PURGIN	G	TIME:	24C DA	TE:3/8/3	S	AMPLE	TIME: 07	9	DATE: 3/8/31
PURGE METHOD:	<b>☑</b>	PUMP BAILER	PERISTALTIC F	PUMP		11166	U CONDU	, 1C	umhos/cm
DEPTH TO WA	ATER:	13.53	T/ PVC		TURBI	DITY: <u>50</u>	NTU		
DEPTH TO BOTTOM:									
WELL VOLUME	<u>:</u>	NA	LITERS	GALLONS	TEMPE	RATURE:	<u>7₀                                    </u>	OTHER:	
VOLUME REM	OVED:	9	LITERS	GALLONS	COLO	r: <u>Clu</u>	201	ODOR:	101
COLOR:		clar.c	RUI_ OD	OR: DOL	_ FILTRA	TE (0.45 um)	YES	NO	
			BIDITY	, — · · · · · · · · · · · · · · · · · ·	FILTRA	TE COLOR:		FILTRATE O	DOR:
NONE	SLI	днт 🗗	MODERATE	☐ VERY	QC SA	MPLE: MS	/MSD	1-400 B	
DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER COMMENTS: WP-Scw-LF-3									
1 110/11- 1	JRGE ATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERAT	JRE WATER	
(M	L/MHN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET	
06 NO D	v V	400	1552	18 1	9.8	43.0	5. 1	13.5	3 INITIAL
664T		754	1551	-9.0	7.0	39.0	(0.0	13.8	7 16
0610		745	1568	-51.6	2115	∂β.∪	70	138	
7720		7.40	1536	-1000	1,60	llevo	7.4	138	1 3,00
nu		7.35	1530	-1250	1.40	140	7. (	138	T &
0705		7.35	1515	-135.0	1.30	10	7,6	138	
0710		7,37	1508	-1750	1.29	70	7.7	138	
0715	7	737	1500	-1500	1,50	5	7.6	136	T 9.7
6/10		7.37	1808	.149.5	1.19	S	クバ	(38)	
0715		7.37		- 149.8)	1.19	5.0	う、「	178	~~~~ <del>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</del>
			TEST IS COMPL		•		RE WITHIN		
pH: +/- <b>0.1</b>		COND.: +/-			.O.: +/- <b>0.3</b>			= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-
BOTTLES FI	LED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaO	H E-	HCL F
NUMBER S	SIZE	TYPE	PRESERVATI	VE FILTERE	D NUMB	ER SIZE	TYPE	PRESERVA	ATIVE FILTERED
4 0	(	9 199	<u> </u>		N				□ Y □ N
9 2	50	PI	4		N				□ Y □ N
6 6	1C	15	A.		N				□ Y □ N
2 1	jC	١٦	P	□ Y Ø	N.				□ Y □ N
	***************************************	·			N				□ Y □ N
SHIPPING ME	ΓHÓD;	lab Di	DOD OPP DA	ATE SHIPPED:	3-10	-22	AIRBILL	NUMBER:	
COC NUMBER	.:	,		GNATURE:			DATE S	IGNED:	3///)\
					1		Market Control of the		11111/1/1

<b>⇔</b> T	` <b>∂</b> (				
PROJECT N	AME:	CI	EC V	Vea	do
PROJECT N	UMBEI	₹: 46	409	6.00	0
SAMPLE ID:	MI	$\overline{\mathcal{U}}$	5	-	
WELL MATER	IAL:	☑ P\	/C		S
SAMPLE TYP	E:	☑ G <sup>1</sup>	N		٧
PURGII	٧G	TIME	0	<b>γ</b>	2
PURGE METHOD:	<b>✓</b>	PUMP		PEF	राः
DEPTH TO W	/ATER:	<u>j</u> U.	78	T/	Ρ
DEPTH TO B	ОТТОМ	: <u>N</u>	٩	_ T/	Ρ
WELL VOLUM	1E:	N/	4		Ll
VOLUME REI	MOVED	:		N.	L
COLOR:	(	100	IA	y	_
NONE	☐ SL	IGHT	TUR	BIDI MO	
		[57]			Ξ

	117										
PROJECT	NAME:	CEC W	/eadock LF: 20	22 GW C		PRI	EPARED			CHEC	KED
PROJECT	NUMBER	: 464096	5.0000.0000		BY:	JJ	DATE:3\IL	し ト	A: 21	۷	DATE: 3-15-22
SAMPLE ID: MW - 5   WELL DIAMETER: 2" 4" 6" OTHER											
WELL MATERIAL: PVC SS IRON GALVANIZED STEEL OTHER											
SAMPLE T	SAMPLE TYPE:										
PURC	GING	TIME: 07	43 DA	TE: 3/8	<i>(</i> C\)	S	AMPLE	TIME: 0			TE:3/8/33
PURGE PUMP PERISTALTIC PUMP  METHOD:  BAILER  PH: Y SU CONDUCTIVITY: 7100 umhos/cm  ORP: -1(900 mV DO: 4.300 mg/L											
DEPTH TO	DEPTH TO WATER: 14.78 T/ PVC TURBIDITY: 3.00 NTU										
DEPTH TO	воттом:	NM_	T/ PVC			NOI	NE SLI	GHT	OM [	DERATE	☐ VERY
WELL VOL	WELL VOLUME: NA LITERS GALLONS TEMPERATURE: C OTHER:										
VOLUME REMOVED: 5 DITERS GALLONS COLOR: ODOR:											
COLOR: COOR: ODOR: ODOR: FILTRATE (0.45 um) YES TO											
TURBIDITY   FILTRATE COLOR:   FILTRATE ODOR:											
□ NONE     □ SLIGHT     □ MODERATE     □ VERY     □ QC SAMPLE:     □ MS/MSD     □ DUP-       □ DISPOSAL METHOD:     ☑ GROUND     □ DRUM     □ OTHER     □ COMMENTS:											
DISPOSAL		GROUN	ID DROW	☐ OTHE	K .	COMM	EN15:				
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP		D.O.	TURBIDITY		RATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME (GAL OR L)
0743	(ML/MIN)	(SU) 764	(umhos/cm)	4.8	1	(mg/L)	(NTU) 80.0	G	<u>C)</u>	(FEET) (4.78)	INITIAL
	34	7.53	1996	-30.0		290	18.8	Çe c	<u> </u>	1465	1
6748 6753		7.45	2070	-95.		1.60	40	٠,٠	(	1463	3
0758		740	20103	-118-		1,46	3.75	G. 1	$\dot{I}$	1488	3
1803		7.40	2093	-119		1.39	3.18	Co.	 ₹	1481	<del>U</del>
0808		7.40	2100	- (19.		1.38	3.00	(g) 4	) /	1488	1.5
0000		<i>)</i> , (O	<b>0</b> (		-	1, 10		_ O° '			<b>-</b>
616						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					, <del></del>
0670									·····		<del></del>
									·····		
	ı									<u> </u>	
<b>N</b> 0 pH: +/-		LIZATION 1 COND.: +/-	TEST IS COMPL 3 % ORP:	ETE WHE +/- 10		).: +/- 0.3			or =</td <td></td> <td>G LIMITS: TEMP.: +/-</td>		G LIMITS: TEMP.: +/-
BOTTLE	S FILLED	PRESERV	ATIVE CODES	A - NONE		3 - HNO3	C - H2SO4	D - 1	NaOH	E - HC	CL F
NUMBER	SIZE	TYPE	PRESERVATI	VE FIL	TERED	NUMB	ER SIZE	TYP	E PF	RESERVATI	VE FILTERED
2	125	9/nea	A	□ Y		1					□ Y □ N
,	3-4-	- ·	A		FALL						

рп: +/-	0.1	COND +/-	3 % ORP. +/-	10 0.0	7 +/- U.S	TORB. +/-	10 /6 01	V- 10 1L1	VII +/-
BOTTLE	S FILLED	PRESERV	ATIVE CODES A -	NONE B	- HNO3	C - H2SO4	D - NaOl	H E-HCL	F
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	9/nea	A		ı				□ Y □ N
1	الشين	PI	A		1				U Y U N
1	105	PI	A		ı				N C Y
1	76	PI	B		1				
					1				□ Y □ N
SHIPPING	METHOD:	las Dr	DATE DATE	SHIPPED:	7-10-	72	AIRBILL	NUMBER:	
COC NUM	IBER:		SIGNA	ATURE:			DATE SI	GNED:	11)
						7		)//	170

## ◆ TRC

DDO JECT NAME:	CEC Mandada LE. 20	22 CW C	DDE	DARED		CHEC	KED		
	CEC Weadock LF: 20	22 GVV G	PRE	PARED					
PROJECT NUMBER: 4	464096.0000.0000	BY:	JJ	DATE 3 (II	2λ BA: 2	JR	DATE: 3-15-22		
SAMPLE ID: MULL DIAMETER: 2" 4" 6" OTHER									
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER									
SAMPLE TYPE:  GW WW SW DI LEACHATE OTHER									
PURGING TIM	ME: 0830 DA	1E3/8/27		MPLE	TIME: OGC	D/	TE:3/8/20		
PURGE  PUN METHOD:  BAIL	MP PERISTALTIC P	UMP	PH: _	7.09 st		090 mg			
DEPTH TO WATER: 15	7/ PVC		TURBID		NTU				
DEPTH TO BOTTOM: T/ PVC									
WELL VOLUME:	NA LITERS [	GALLONS	TEMPER	RATURE:	ا عر_4	OTHER: _			
VOLUME REMOVED:	<u> </u> ∡ LITERS [	GALLONS	COLOR	: <u> </u>	<u>pw</u>	ODOR:	10 Kg		
COLOR:	LOCY ODG	OR: <b>100 V</b>	FILTRAT	TE (0.45 um)	YES ?	NO			
TURBIDITY FILTRATE COLOR: FILTRATE ODOR:									
□ NONE □ SLIGHT ☑ MODERATE □ VERY □ QC SAMPLE: □ MS/MSD □ DUP- □ DUP-									
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS:									
RAIE	PH CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERATU	LEVEL	CUMULATIVE PURGE VOLUME		
	(SU) (umhos/cm) G1 946		( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)		
			110	34.0		152			
	17 1981		1.43	170	7.3	11:47			
=	600C PI	-1080 1	113	(0.0)	7.4	1547			
0647 7	10 3015		100	6.00	7.3	1541			
0850 7.1		-138-1	597	5.0	7.3	15.47	4		
185 70	09 2018		91	5-0	7.4	1545	7		
6900 7.0	09 2034	-140 0 C	Au	5.0	7.4	1548	4		
							<del></del>		
	ATION TEST IS COMPL		CCESSIVE	READINGS A		HE FOLLOWIN	IG LIMITS: TEMP.: +/-		
· · · · · · · · · · · · · · · · · · ·	ESERVATIVE CODES		- HNO3	C - H2SO4	D - NaOh				
NUMBER SIZE T	TYPE PRESERVATIN	/E FILTERED	NUMBE	R SIZE	TYPE	PRESERVAT	IVE FILTERED		
	MINL A	UY Z N					□Y □N		
1 250 1	DI A				· · · · · · · · · · · · · · · · · · ·		□ Y □ N		
1 131	51 A								
	>1 B		_						
SHIPPING METHOD: la	is Drop off DA	TE SHIPPED:	3-11	9-22	AIRBILL N	NUMBER:			
COC NUMBER:		SNATURE:			DATE SIG		11/11		
			//	4	7	<del></del>	11100		

<b>;</b> }	T	F	?	C
	-	-	_	_

			<del> </del>	<del></del>							
PROJECT I	NAME:	CEC W	/eadock LF: 20	122 GW C		PREF	PARED			CHE	ECKED
PROJECT !	NUMBER	: 464096	3.0000.0000	ву	:	JJ	DATE 3 11	122	BY: 7	sk_	DATE: 3-15-22
SAMPLE ID	SAMPLE ID: MW. 53 WELL DIAMETER: 2" 4" 6" OTHER										
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER											
SAMPLE TY	SAMPLE TYPE:										
PURG	ING	TIME: 炎	CC DA	TE: 3/8/2	60			TIME:	093	1	DATE 3/8/33
PURGE METHOD:	_	PUMP BAILER	PERISTALTIC P	UMP		PH: " <u>7</u> ORP: <u>"1</u>	.पप <sub>s</sub> ५५० ू		NDUCT	A	mg/L umhos/cm
DEPTH TO			T/ PVC	,		TURBIDIT	117.	NTU			
DEPTH TO I		<del></del>	T/ PVC			NONE	,	— GHT	: M	ODERATE	□ VERY
WELL VOLUME: NA LITERS GALLONS TEMPERATURE: C OTHER:											
VOLUME RE	· · · · · · · · · · · · · · · · · · ·	u	LITERS	GALLONS		COLOR:		201	0	DOR:	non
COLOR: COLOR: ODOR: OTO FILTRATE (0.45 um) YES NO											
			BIDITY			ILTRATE	· T		<u>-</u>	ILTRATE C	DDOR:
NONE SLIGHT MODERATE VERY QC SAMPLE: MS/MSD DUP-											
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS:											
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP	D	.0.	TURBIDITY	TEMPI	ERATURE	WATE	
	(ML/MIN)	(SU)	(umhos/cm)	(mV)		ng/L)	(NTU)		(°C)	(FEE	
ogu .	500	785	689	-)(e. 1	9.	.C	120	Le	2,	144	() INITIAL
297		750	1344	.95.0	1.0		3.0	(q		141	0
6721		7.45	13.53	- 128 5	1.3	30	200	Q	.7	1410	1/ 3
0970		7.44	1351	-1768		Δ	200	to	. 6	141	
6935		7.44	1360	-129.0		~,	1.95	to	.6	141	
		7			<del>                                     </del>						
					+						
			···								
	\			`	].						
NO1 pH: +/- 0		L <b>IZATION</b> 1 COND.: +/-	TEST IS COMPL 3 % ORP:			ESSIVE   +/- 0.3	READINGS A TURB: +/-			E FOLLOV /=  10	VING LIMITS: TEMP.: +/-
BOTTLES	FILLED	PRESERV	ATIVE CODES	A - NONE	B - H	HNO3	C - H2SO4	D -	NaOH	E -	HCL F
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTER	ED	NUMBER	R SIZE	TYI	PE I	PRESERV	ATIVE FILTERED
9	761	GlACI	1)		ΗN						□ Y □ N
	250	16	Ð	□ Y J	HN						
	7 ()	51	A-		l N						
,	76	D1 1:	6		- - N						
	( <i>o</i> '				] N						
SHIPPING N	METHOD:	las D	rap off DA	TE SHIPPED:		3-10-	2.2	AIF	RBILL NU	JMBER:	
COC NUMB	ER:			GNATURE:				DA	TE SIGN	NED:	2/1/22
<u> </u>							1				<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>

シード シー・	TRC
---------	-----

PROJECT NAME: CEC Weadock LF: 2022 GW C	·	PRE	PARED			CHEC	KED	
PROJECT NUMBER: 464096.0000.0000 BY	·:	JJ	DATE	دوا	BA: ZK	_	DATE: 3-15-22	
SAMPLE ID: ()(0)-52 WELL DIA	METE	R. [7]		6" $\square$	OTHER			
WELL MATERIAL: PVC SS IRON GALVANIZED STEEL OTHER								
SAMPLE TYPE: 7 GW WW SW DI			EACHATE		OTHER			
					3 0 =			
PURGING TIME: 0 9 TO DATE: 3/6/3	2		AMPLE	TIME:	103		TE3/E/JO	
PURGE ☑ PUMP PERISTALTIC PUMP METHOD: ☐ BAILER ,	J.		7,50 - SI		IVITOUDN			
DEPTH TO WATER: 621 T/ PVC		ŢURBIE	OITY: 10.0	יאו ל	J			
DEPTH TO BOTTOM: NM T/ PVC DEPTH TO BOTTOM: NONE SLIGHT MODERATE VERY							☐ VERY	
WELL VOLUME: NA LITERS GALLONS	;	TEMPEI	RATURE:	1/1	°C OTH	IER:		
VOLUME REMOVED: U LITERS GALLONS	;	COLOR	: <u>c</u> /w	V	ODC	DR: <u> </u>	ion e	
COLOR: THAISH ODOR: MONG	2	FILTRA	TE (0.45 um)	YES	· <del> </del>	NO		
TURBIDITY FILTRATE COLOR: FILTRATE ODOR:								
□ NONE □ SLIGHT □ MODERATE □ VERY QC SAMPLE: □ MS/MSD □ DUP-								
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS:								
TIME PURGE PH CONDUCTIVITY ORP	T	0.0.	TURBIDITY	TEMP	ERATURE	WATER	CUMULATIVE	
RATE (ML/MIN) (SU) (umhos/cm) (mV)	١.	mg/L)	(NTU)		(°C)	LEVEL (FEET)	PURGE VOLUME (GAL OR L)	
0950 109 795 666 -33.7	<del></del>	30	(W)(O)	4,		B3.	INITIAL	
	_			4.0	4.	8.60	.5	
	- <del></del>	64	1350		<u>ر ر</u> رح	86	, ,	
boc 755 1345 -102.5		47	570					
1007 7.50 1347 -1150		.30	23.0	4	9	865	1.0	
1010 750 1349 -1250		29	17.0	4.		8.67	7	
1015 750 1353 -1250		20	150	4.	4	865	2.7	
1070 7.50 1357 -127.5	1.	28	10.0	4.	4	EVE V	3	
105 7.50 1364 -127.0	$\prod_{i}$	27	10.0	Щ.	Ч	46	3. \	
1030 750 1768 -177.5	1	5	10.0	4,	4	6.61	4	
	† <b>`</b>				***************************************		<b> </b>	
NOTE: STABILIZATION TEST IS COMPLETE WHEN 3	SIICO	ressivi	E DEADINGS /	DE WIT	THIN THE I	FOLLOWIN	GLIMITS:	
		+/- 0.3					TEMP.: +/-	
BOTTLES FILLED PRESERVATIVE CODES A - NONE	В-	HNO3	C - H2SO4	D	NaOH	E - HC	CL F	
NUMBER SIZE TYPE PRESERVATIVE FILTER	RED	NUMBI	ER SIZE	· TYI	PE PF	RESERVATI	VE FILTERED	
2 123 9/45 A DY	- N						OY ON	
1 250 P1 A DYE	N E						□ Y □ N	
	\$ N							
1 (3 (7) )	] N						O Y O N	
	] N						OY ON	
SHIPPING METHOD: 105 Drop OF DATE SHIPPED	. า	~10~	7.> <del>-</del>	ΔIF	RBILL NUM	MBER:		
					····			
COC NUMBER: SIGNATURE: DATE SIGNED: 3/1//								

•		_
<b>→</b>		
•	117	_

PROJECT NAME: CEC Weadock LF: 2022 GW C	PREPARED	CHECKED							
PROJECT NUMBER: 464096,0000.0000 BY:	JJ DATE: PS/LL	100 BY: 5K DATE: 3-15-22							
SAMPLE ID: MW-53/L WELL DIAME	TER: 🗸 2" 🗌 4" 🗍 6	" OTHER							
	ANIZED STEEL	OTHER							
SAMPLE TYPE:	☐ LEACHATE	☐ OTHER							
PURGING TIME: () 4 DATE: 3/8/2)	SAMPLE	TIME: 1309 DATE: 36/5							
PURGE ☑ PUMP PERISTALTIC PUMP	PH: 7.09 SU								
METHOD: BAILER	ORP: -139.1 mV	DO: 1,09 mg/L							
DEPTH TO WATER: 1470 T/ PVC	TURBIDITY: 4.71	NTU							
DEPTH TO BOTTOM: NA T/ PVC	□ NONE □ SLIG	HT MODERATE VERY							
WELL VOLUME: NA LITERS GALLONS	TEMPERATURE: 2	3°C OTHER:							
VOLUME REMOVED: (2) X LITERS GALLONS	COLOR: ( \V(	ODOR: NON-P							
COLOR: Brown ODOR: DOVE	FILTRATE (0.45 um)	1./							
TURBIDITY FILTRATE COLOR: FILTRATE ODOR:									
□ NONE □ SLIGHT □ MODERATE □ VERY □ QC SAMPLE: □ MS/MSD □ DUP-									
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER	COMMENTS:								
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL PURGE VOLUME									
(ML/MIN) (SU) (umhos/cm) (mV) ( mg/L) (NTU) (°C) (FEET) (GAL OR L)									
1229 200 7.76 694 -48.6 10	0.0 2400	Ge3 170 INITIAL							
	87 500	7.1 1483 1							
	98 700	7,1 (483)							
p44 / 7-11 1439 -1050 1	67 18.10	7.2 1483 3							
1249   7.10 1437 -1150	58 33.0	7.2 (483) 4							
1254 7.09 1432 -128.0	1.30 15-0	7.3 1463 5							
	1.30 50	7.2 1483 6							
1309 709 1431 -1290	1.79 50	7.2 1467 )							
1309 709 1430 -129.5	1.29 4.75	7.3 1485 8							
1319									
NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SU	CCESSIVE READINGS AF	RE WITHIN THE FOLLOWING LIMITS:							
pH: +/- <b>0.1</b> COND.: +/- <b>3</b> % ORP: +/- <b>10</b> D.C	:: +/- <b>0.3</b> TURB: +/- 1	0 % or = 10 TEMP.: +/-</td							
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							
7 13; 9/AS A DY 15/A									
1 25U pl A DY A									
( 1) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )									
( DI PI B DYEN		и 🗆 ү							
SHIPPING METHOD: (ab Drap off DATE SHIPPED:	3-10-22	AIRBILL NUMBER:							
COC NUMBER: SIGNATURE:		DATE SIGNED: 3///n,1							
3/11/1									

											PAG	<u> </u>
<b>;&gt;</b> .	TRO		* <b>V</b>	VATER	SA	<b>MP</b>	LE LO	3				
PROJECT	ΓNAME:	CEC V	Veadock LF: 2	022 GW C		PRE	PARED				CHECK	KED
PROJECT	г нимвег	R: 46409	6.0000.0000	В	Y:	JJ	DATE:3	66/19	BY:	312	-	DATE:3-15-2)
SAMPLE	ID: MU	U~§	4/2	WELL DI	AMET	ER: 🗸	2"	6" [	ОТН	ER	•••	
WELL MAT	ERIAL:	✓ PVC	□ss □	IRON 🔲 G	ALVA	NIZED S	TEEL	С	ОТН	ER		
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗆 🗆	)  	l	LEACHATE		ОТН	ER _		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
PUR	GING	TIME:6 (	0 / DA	TE:39/3	<b>3</b>	SA	AMPLE	TIME:	070	2 V	DA	TE: 3/6/37
PURGE	7	PUMP	PERISTALTIC F	<del></del>		PH:	691	su co	NDUC		Y: \(\frac{131}{31}\)	umhos/cr
METHOD	D: 🗆	BAILER				ORP:	60.5	mV DO	:	1.90	mg/	L
DEPTH TO	O WATER:	14.21	T/ PVC			TURBIC	DITY: 1.6	C NT	U			
DEPTH TO	ВОТТОМ:	hw	T/ PVC			MON	lE □ s	_IGHT		MODE	ERATE	☐ VERY
WELL VOL	.UME:	NA	LITERS	☐ GALLON	S	TEMPE	RATURE: _	51	<b>_</b> °C	OTHE	R:	
VOLUME	REMOVED:	_ಟ_	LITERS	☐ GALLON	s	COLOR	: <u>(</u>	ew		ODOF	₹: <u>``</u> `	010
COLOR:		zrowi		OR: <u>101</u>		FILTRA	TE (0.45 um)	☐ YE	S	<u> A</u> N	10	
		TUR	BIDITY			FILTRAT	E COLOR:		···-	FILTE	RATE ODO	R:
NONE		GHT	MODERATE	VER'	Υ	QC SAI	MPLE: M	S/MSD			UP	
DISPOSAL	L METHOD:	GROU	ND DRUM	OTHER		COMM	ENTS:					
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP		D.O.	TURBIDITY	TEMP	ERATU	RE	WATER LEVEL	CUMULATIVE PURGE VOLUMI
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	(	mg/L)	(NTU)		(°C)		(FEET)	(GAL OR L)
0675	204	Ha	1367	54, J	9	0	400	4	3.5	į	Y>	INITIAL
6670		701	1311	4,4	7	136	76.0	5:	7		1440	
desi		708	1308	10.9	L	.7	220	5.	3		านนา	2
deuc		695	1311	ふろ	ľ	10	600	5.	3		1445	3
COUT		690	1315	-18.0	į a	190	3.60	5	١		(५५५	<u> </u>
ser		600	1314	-45.,8	ŝ	200	2.90	S.	Ç		14u1	7
olein		6.90	1315	-598		95	205	5	. [		1445	b
67LL		691	1316	- 60.0		190	1.85	5	,(		1445	ή,
U705		691	1317	. Lev.	(	.90	1.80	5			1445	بخ
												***************************************
NC pH: +/-		LIZATION COND.: +/-	TEST IS COMPL	ETE WHEN :		CESSIVE	E <b>READINGS</b> TURB: +/			'HE FC		G LIMITS: TEMP.: +/-
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	В-	HNO3	C - H2SC	4 D-	NaOF	1	E - HCI	L F
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTEI	RED	NUMBE	R SIZE	TY	PE	PRE	SERVATI	/E FILTERED

pH: +/-	0.1	COND.: +/-	3% ORP: +/	- 10	.D.O.:	+/- 0.3	TURB: +/-	<b>10</b> % or	= 10 TEN</th <th>ИР.: +/-</th> <th></th>	ИР.: +/-	
BOTTLES	BOTTLES FILLED PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F										
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTI	ERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILT	ERED
3	ひて	alks	A	□ Y						ΠY	□И
f	250	19	A	□ Y	[ <del>]</del> ν			-		□ Y	ПΝ
1	195	191	A	□ Y	<b>7</b> N					ΠY	□и
1	76)	19	<u>@</u>	□ Y	ĮŽΊΝ					ΠY	ПΝ
				ΠY	Z					ΠY	ПΝ
SHIPPING	METHOD:	ab D	rop off DAT	SHIPPE	ED:	7-10-	22	AIRBILL I	NUMBER:		
COC NUM	COC NUMBER: DATE SIGNED: 3/4/)										
	-		<u> </u>							<del></del>	-

## ♦ TRC

PROJECT NAME:	PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED									
PROJECT NUMB	ER: 46409	6.0000.0000	BY:	JJ	DATE 3/K	J Y B	15 ZK	-	DATE: 3-15-22	
SAMPLE ID:	U- 50	1	WELL DIAM	IETER: 🗾	2"	6" 🔲 0	OTHER			
WELL MATERIAL:	☑ PVC	□ ss □	IRON GAL	VANIZED S	STEEL		OTHER			
SAMPLE TYPE:	☑ GW	□ ww □	SW 🔲 DI		LEACHATE		OTHER			
PURGING	TIME O	114 DA	TE3 9 13	) S	AMPLE	TIME: C	749		CC/9/83T	
PURGE E	DUMP BAILER	PERISTALTIC I	PUMP	PH: ORP:	<u> 7:1~</u> s -124.7 m	U CONI	DUCTIVI <u>le (</u>	TY: <b>(343</b> 7 mg/		
DEPTH TO WATER	7.48	T/ PVC		TURBI	DITY: 10.C	NTU				
<b>DEPTH TO BOTTO</b>	M: <b>NM</b>	T/ PVC		Фио	NE 🗌 SLI	GHT [	☐ MOE	DERATE	☐ VERY	
WELL VOLUME:	NA	LITERS	☐ GALLONS	TEMPE	RATURE: <u>5</u>	9 ~	ОТН	ER:		
VOLUME REMOVE		☑ LITERS	☐ GALLONS	COLO	<b>^1</b>	201	ODC	DR:	101P	
COLOR:	<u> </u>	la_ oo	OR: NONY	FILTRA	TE (0.45 um)	☐ YES		NO		
		BIDITY	_	FILTRA	TE COLOR:	·····	FILT	RATE ODO	R:	
		MODERATE	☐ VERY	QC SA	MPLE: MS	/MSD		DUP-	· 	
DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER COMMENTS:										
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE WATER CUMULATIVE LEVEL PURGE VOLUME										
(ML/MIN	) (SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C	c)	(FEET)	(GAL OR L)	
U714 10P	753	133 6	92.2	19.0	50.0	9, 1		247	INITIAL	
0719	7.24	1357	-49.5	2.49	37.0	5.3	)	ごこご	,5	
0724	720	1364	- 90.0	1.55	18.60	5.4		7.7.5	Ì	
0729	718	1323	-1300	1.30	21.0	56	,	ブイン	1.5	
U734	7.15	1380	-120.1	1.20	1110	54	'	ブバ	Ç	
0739	7,14	1385	-1340	1.18	100	6.0	,	フじて	2.1	
5744	7.15	1789	-1245	1.18	10.0	(e.c	,	ごこご	3.,	
6749	7.15	1393	-124.9	1.17	100	5.0	)	755	3.1	
NOTE: STA	BILIZATION '	TEST IS COMPL	ETE WHEN 3 S	UCCESSIV	E READINGS A	RE WITH	IN THE F	OLLOWING	G LIMITS:	
pH: +/- 0.1	COND.: +/-			O.: +/- <b>0.3</b>	TURB: +/-	10 %	or =</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-	
BOTTLES FILLED		ATIVE CODES		B - HNO3	C - H2SO4	1		E - HC		
NUMBER SIZE	NUMBER SIZE TYPE PRESERVATIVE FILTERED NUMBER SIZE TYPE PRESERVATIVE FILTERED									
2 195										
1 250	19	A		N					Y N	
1 198	b1	<u>+</u>	3-	N						
1 125	١٩	<b>Q</b>		N					N O Y	
				N					□ Y □ N	
SHIPPING METHOD	eab Dr	Up off DA	ATE SHIPPED:	7-1	0-22	AIRBI	ILL NUMI	BER:		
COC NUMBER: DATE SIGNED: 2/1/1										

## **⇒** TRC

PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED										
PROJECT NUMBER: 464096.0000.0000	BY:	JJ I	DATE: 3/W.	BY:	5K	DATE: 7-15-22				
SAMPLE ID: WEL STR OUT WEL	L DIAMETE	R: 🗸 2"	<u> </u>	в" 🗌 ОТНЕ	ER					
WELL MATERIAL:  PVC SS IRON [	GALVAN	IIZED STEE	L .	OTHE	ER					
SAMPLE TYPE:	] DI	LEA	CHATE	□ отне	ER					
PURGING TIME: 0000 DATE: 31	9/33	SAM	PLE T	TIME:063		TE3/9/33				
PURGE ☑ PUMP PERISTALTIC PUMP METHOD: ☐ BAILER		PH: 'Z' 2 ORP: '='36			TIVITY: 139 4.91 mg					
DEPTH TO WATER: 9~43 T/ PVC		TURBIDITY	4.15	_ NTU						
	- I	NONE	SLIGI	£	MODERATE	☐ VERY				
WELL VOLUME: NA LITERS GAL	LONS -	TEMPERAT	URE: 4	°گ	OTHER:					
VOLUME REMOVED: ☐ LITERS ☐ GALI	LONS	COLOR:	<u>Clipa</u>	<u>a</u> (	odor: 🕰	21/0				
color: colu odor: ha	one 1	FILTRATE (	0.45 um)	YES	₹ NO					
TURBIDITY	Ī	FILTRATE C	OLOR:		FILTRATE ODC	)R:				
□ NONE □ SLIGHT □ MODERATE □ N	/ERY	QC SAMPL	.E: MS/N	<b>ISD</b>	DUP-					
DISPOSAL METHOD: GROUND DRUM OTH	ER	COMMENT	S:							
TIME PURGE RATE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL PURGE VOLUME (ML/MIN) (SU) (umhos/cm) (mV) (mg/L) (NTU) (°C). (FEET) (GAL OR L)										
	<del>1</del>		(NTU)	3. E	G.U.S	(GAL OR L) INITIAL				
		6.0	15.0							
0011 726 1295 -23			35.0	4.9	1031	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				
0616 724 1299 -30	0 5		.40	4.6	1045					
067 194 1995 -30.	5 5	· · · · · · · · · · · · · · · · · · ·	1.50	48	1153	1.1				
8836 7.23 1294 330.	8 4	97 4	(.31)	48	1907					
0031 733 1297 -30	. 7 4.	9T 1	1.15	48	1316	2, 1				
						3				
						3,1				
NOTE: STABILIZATION TEST IS COMPLETE WH	EN 3 SUCC	ESSIVE RE	EADINGS AR	RE WITHIN T	HE FOLLOWIN	G LIMITS:				
pH: +/- <b>0.1</b> COND.: +/- <b>3</b> % ORP: +/- <b>10</b>	D.O.: -	+/- 0.3	TURB: +/- 1	<b>0</b> % or	= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-				
BOTTLES FILLED PRESERVATIVE CODES A - NON	IE B-I	HNO3	C - H2SO4	D - NaOH	E - HC	L F				
NUMBER SIZE TYPE PRESERVATIVE FII	LTERED	NUMBER	SIZE	TYPE	PRESERVATI	VE FILTERED				
2 125 9115 A	N					□ Y □ N				
	/ · [] N									
	/ <b>[</b> ] N									
	/ DD N									
	/   N					□ Y □ N				
SHIPPING METHOD: Lay Drop of DATE SHIP	PED:	3-10-	32	AIRBILL N	IUMBER:					
COC NUMBER: SIGNATUR				DATE SIG		7.75				
			<del>} </del>			<del>)  /                                   </del>				

<b>&lt;&gt;</b>	TA	2
_		

PROJEC1	PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED									
PROJEC <sup>1</sup>	NUMBER	R: 464096	6.0000.0000	BY	; JJ	DATE:	(12)	BY: 3	K	<sup>DATE:</sup> <b>ን-/</b> ው-2入
SAMPLE	ID: G	B -	01	WELL DIA	METER: 🔽	2"	6"	OTHER		
WELL MAT	ERIAL:	☑ PVC	□ss □	IRON □,GA	LVANIZED S	STEEL		OTHER		
SAMPLE T	YPE:	☑ GW	□ww □	sw 🗖 DI		LEACHATE		OTHER	-	
PUR	SING	TIME:	DA	ATE:	S	AMPLE	TIME:	084	O DA	TE:3/9/22
PURGE METHOI	· =	PUMP BAILER	PERISTALTIC I	PUMP	PH: ORP:	71/	U CO	NDUCTIVI	TY: 10 mg	/L umhos/cm
DEPTH TO	<del>-                                    </del>	X	T/ P//C		TURBI		NTU			
DEPTH TO	воттом		T/ FVC		#LNO	NE SLI	GHT	□ мог	DERATE	☐ VERY
WELL VOL	UME:	\NA	LITERS	☐ GALLONS	TEMPE	RATURE: /		°C OTH	IER:	
VOLUME	REMOVED:		LITERS	☐ GALLONS	COLO	R: <u>(</u> `\&	<u>'(-</u>	ODO	DR: 💃	101
COLOR:		<del></del>	<b>/</b> OD	OR:	FILTRA	NTE (0.45 um)	☐ YES	; <u>/</u>	NO	
	γ	TUR	BIDITY		FILTRA	TE COLOR:		FIL	TRATE ODC	DR:
☐ NONE	☐ SLI	GHT 🗌	MODERATE	☐ VERY		MPLE: MS	/MSD		DUP-	
DISPOSAL	DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS:									
TIME	TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE WATER CUMULATIVE									
, uar	RATE (ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	l	(°C)	LEVEL (FEET)	PURGE VOLUME (GAL OR L)
	(IVIL)	(00)	(diffilos/citi)	(1114)	(111g/L)	(110)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		(1221)	INITIAL
			······································		<u> </u>					
			· · · · · · · · · · · · · · · · · · ·	<u> </u> -	ļ					
				<b>\</b>	<del>                                     </del>					
					1_/_[		ļ			
				\						
					10					
							<b></b>			
	*************				-		ļ			
	***************************************									
			ļ		1					
NO	OTE: STABI	ILIZATION	TEST IS COMPI	ETE WHEN 3	SUCCESSIV	'E READINGS /	ARE WIT	HIN THE I	OLLOWIN	G LIMITS:
pH: +/-	0.1	COND.: +/-	3 % ORP:	+/- 10	D.O.: +/- <b>0.3</b>	TURB: +/-	10 %	or =</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-
BOTTLE	S FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D-	NaOH	E - HC	L F
NUMBER	SIZE	TYPE	PRESERVATI			SER SIZE	TYF	PE PR	ESERVATI	VE FILTERED
	751	PI	1		N					
(	125	Pl	B							□ Y □ N
					N					□ Y □ N
					N					
					N		<b></b>			
SHIPPING	METHOD:	Jah Ar	10 AG 00	ATE SHIPPED:	3-10 -	27	AIR	BILL NUM	BER:	
										11/1/22
	COC NUMBER: SIGNATURE: DATE SIGNED: 344									

## ◆ TRC

PROJECT	NAME:	CEC V	Veadock LF: 2	022 GW C		PRE	PARED		,	CHEC	KED
PROJECT	NUMBER	R: 46409	6.0000.0000	I	BY:	JJ	DATE うしい	CC	BA: 21	_	DATE: 3-15-22
SAMPLE	ID:	3 #1	ン	WELL D	NAMET	ER: 🗸	2"	6" 🗌	OTHER		
WELL MAT	ERIAL:	PVC	□ss □	IRON 🔲	GALVA	NIZED S	TEEL		OTHER		
SAMPLE T	YPE:	☑ GW	□ww □	sw 🗇	DL	<u> </u>	EACHATE		OTHER		
PUR	GING	TIME:	D/	ATE:			MPLE	TIME:	084	DA	TE:395
PURGE METHOI	٠	PUMP B <b>AN</b> LER	PERIOTALTIC	PUMP		PH. A	111	U CO IY <b>/I</b> DO:	NDUCTIVI	1-M	/ umhos/cm /L
DEPTH TO	WATER:	$\bot\!$	T/ PVC		-	TURBIC	DITY: V	// NTL	J		
DEPTH TO	BOTTOM:		TXPVC			MON HON	IE SLI	GHT	☐ MOI	DERATE	☐ VERY
WELL VOL	UME:	NA\	LITERS	GALLO	NS	TEMPE	RATURE:	01	°C OTH	IER:	
VOLUME I	REMOVED:	$\bot$	LITERS	☐ GALLO	vs	COLOR	: <u>C</u> 1	<u> </u>	OD	DR: 1	or_
COLOR:		1		OR:		FILTRAT	ΓΕ (0.45 um)	☐ YES	<b>7</b>	NO	
			BIDITY			FILTRAT	E COLOR:	•	FIL	TRATE ODC	DR:
NONE	🗌 SLI		MODERATE	VER	Y		/IPLE: MS	/MSD		DUP-	
DISPOSAL	_ METHOD:	∐ GROUI	ND DRUM	OTHER		COMME	ENTS:				
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP		D.O.	TURBIDITY	TEMPE	RATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	(	mg/L)	(NTU)	(	°C)	(FEET)	(GAL OR L)
											INITIAL
					***************************************						
***************************************			**************************************		_						
***************************************		***************************************		/i\ \ \\	-/-	$\overline{}$					
ACCORDING TO A SECURITY OF TAXABLE PARK		<del></del>			-/ -						
				H - H	K	$\top$	<del></del>				
			j	$- \setminus -$	/⊢						
					-						
NC	TE: STABI	LIZATION <sup>-</sup>	TEST IS COMPI	ETE WHEN	3 SUC	CESSIVE	READINGS A	RE WIT	HIN THE F	OLLOWIN	G LIMITS:
pH: +/-	0.1	COND.: +/-	3 % ORP:	+/- 10	D.O.:	+/- 0.3	TURB: +/-	10 %	or =</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	В-	НNО3	C - H2SO4	D -	NaOH	E - HC	L F
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTE	RED	NUMBE	R SIZE	TYF	PE PR	ESERVATI	
1	125	P(	A	□ Y [	<b>X</b> N						□Y □N
	155	771	13'		<del>/</del> N	<b> </b>					
1	("	_(_`_	· · / ·		N	<del> </del>		<b> </b>			
					_ N	<b> </b>					
					N	<del> </del>				······································	
SHIPPING	METHOD	1.1 K	off Di	ATE SHIPPE		7 1.0	- 0 1	AID	DILL VILLE	BED:	
		lasb 1		······································	J	יטו-ע	- <u>22</u>		BILL NUM		<del></del>
COC NUMI	BEK:		SI	GNATURE:		//		DA <sup>-</sup>	TE SIGNEI	D: 3	<del>((( ) )                               </del>
						_ (				,	, 0

## ♦ TRC

PROJECT	ΓNAME:	CEC V	Veadock LF: 2	022 GW C		PR	EPARED		CHEC	KED
PROJECT	NUMBER	R: 46409	6.0000.0000	E	BY:	JJ	DATE:っ	dy BY:	JK	DATE: 3-15-22
SAMPLE	ID:L.H	1031	2	WELL D	DIAMET	ΓER: ✓	2" 4"	6" OTH	HER	
WELL MAT	ERIAL:	☑ PVC	□ss □	IRON 🔲 (	GALVA	NIZED S	STEEL	□ отн	IER	
SAMPLE T	YPE:	☑ GW	□ww □	sw □ I	DI		LEACHATE	ОТН	HER	
PUR	GING	TIME:	Q("3) DA	TE3 (OL:	))		AMPLE	·	/ .1	ATE: 3/10/3
PURGE METHOD	· <del></del>	PUMP BAILER	PERISTALTIC F	PUMP			1) ( 6 m		(16 mg	umhos/cm
DEPTH TO	WATER:	24.85	T/ PVC			TURBI	DITY: 27%	NTU		
		37.80				ZÎNO		GHT 🔲	MODERATE	☐ VERY
WELL VOL		NA NA	LITERS	☐ GALLON	NS	TEMPE	RATURE:	, <del>2</del> ) °c	OTHER:	
	REMOVED:	-	LITERS	GALLON	NS	COLO	- + T.	ev		10K
COLOR:	(	Tea		 OR: <b>ΛΟΥ</b>		+			NO L	
OOLOIN.			BIDITY	OIL <u>110 1</u>		<del>-</del>			<sub>1</sub> =7=	OD:
□ NONE	☑ SLI		MODERATE	☐ VER	RΥ		TE COLOR: MPLE: 🔀 MS	/MSD	FILTRATE OD	
DISPOSAL			ND DRUM	OTHER			IENTS:LL H		tech BUP	IMC/MCIS
TIME PURGE RATE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL PURGE VOLUME										
( )	(ML/MIN)	(SU)	(umhos/cm)	(mV)		( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)
Cler	Dep_	U.C	SOG	14.3	٤	3, 0	33.0	7.0	2486	
6618		694	382 g	-97.3	<u> </u>	80	99. o	6.9	230	
DG 33	'	697	27 21	-113.6		.38	19.0	69	JSOL	Ĵ
3000		697	JC059	-119.0		.30	25.0	6.8	25.10	3
Se 33		697	J(J)	-1397		( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )	93, <i>8</i> 0	68	2510	9
0638		6.96	2559	-119.8	<b>)</b> [,	,53	31.0	G. G	330	5
0643		6.96	2559	-119.	8 1	136	13	64	1910	6
6648		6.92	2917	-170.0	, (	ગઇ	(ho	¥ ق	75.10	7
0653		6.92	J5.08	-170.8		.18	9-21	6.3	2510	18
6450		691	2914	-1210	l.	17	7,29	61	29.10	9
	OTE: STABI	•	TEST IS COMPL	ETE WHEN +/- 10	3 SUC	CESSIV				<u>-</u>
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	В.	- HNO3	C - <b>H</b> 2SO4	D - NaOl	H E- H	CL F
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTE	RED	NUMB		TYPE	PRESERVAT	
9	60nL	VOA	A		N	6	250mL	4105	A	
1	250mL		A	□Yt	N		<b>A</b>			□ Y □ N
1	125 INL	Ì	A		N DX	٠,	/ 1	0 100 100	es er e	Λ □Y □N
1	J	7	ß		N		- Hy ; B	14WE-Y-W	ISD, FB, E	
· · · · · · · · · · · · · · · · · · ·				□ Y [	,   N					□ Y □ N
SHIPPING	METHOD:	las	Drop Off DA	TE SHIPPE	D:	3-10-	22	AIRBILL	NUMBER:	
COC NUMI	BER:		SIG	GNATURE:				DATE SI	GNED:	3/1/27
711113										



(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Weadock LF: 2022 GW Co		PREF	PARED		CHEC	KED
PROJECT NUMBER:	464096.0000.0000	BY:	IJ	DATE 3/11/23	BY:	2K	DATE: 3-15-22

SAMPLE ID: LH \_ 103K

	PURGE	I				1.		WATER	CUMULATIVE
TIME	RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERATURE	LEVEL	PURGE VOLUME
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)
0703	200	J.95	2498	-171.6	116	(NTU)	(°C)	つらん	(0
						***************************************			
		<u> </u>	<b></b>			-			
	ļ								***
			1		<b></b>				
		İ							
``	<u> </u>	l			<del> </del>				
			<b>_</b>	**************************************	ļ				
				·					
	İ			***************************************	<del> </del>				
<u> </u>	ļ	ļ	J	***************************************	ļ				
	<u> </u>								
					<del> </del>	<u> </u>			
				******************************					
	1		<del> </del>		<del> </del>				
	<del> </del>	<del> </del>	- <del></del>		<b></b>	1		<u> </u>	
	ļ				ļ		<b>ļ</b>		<b></b>
ĺ									
		<del> </del>	+		<del> </del>	<del> </del>	<del> </del>	<del> </del>	<del> </del>
***********	ļ		<u> </u>		<b></b>		<u> </u>		
					<del> </del>	<del> </del>	<u> </u>	<del> </del>	
		ļ					ļ	<u> </u>	
1								1	

		r	
/ \	2	11	112
1		$\perp \downarrow \downarrow \downarrow \downarrow$	0
$\mathcal{O}_{\mathcal{I}_{\mathcal{I}}}$	•		ı

DATE SIGNED:			

										f 47	22-0150 Page 44 of 47	5	03-09-2022	). 		Q1 Q1	720	
M&TE #: 0 13 40 7 Cal. Due Date: 6-3-32-	M&TE#: Cal. Due I	Received on Ice?	Received on loe? Temperature: 1.6-3.8 °C	d on l	eceive empen	To R					RECEIVED BY:		TIME:	DÁTE/TIME:	/	_ (;	RELINQUISHED BY:	RE
		•									Fall Ex	14ce	slas	3/				
			**	ENTS	COMMENTS:	Ω					RECEIVED BY:		TIME:	DATE/TIME:			RELINQUISHED BY:	RE
	1		×	×	×	×			4	U)		UT	OW-57R OUT	GW			-12	
			×	×	×	×		1	4	υ,			MW-55	GW	6443	3/7/31	-11	1
			×	×	×	×		-	4	Uı			MW-54R	GW			-10	
To the state of th			×	×	×	×		1	4	Us.			MW-53R	GW	1369	3612	-09	
			×	×	×	×		1	4	72		and description of	MW-53	GW	0935	3/8/22	-08	
			×	×	×	×		-	4	5			MW-52	GW	$cc_{lc}$	3/8/22	-07	
			×	×	×	×		-	4	<u></u>			MW-51	GW	0,000	3/18/23	-06	
			×	×	×	×		-	4	Uı			MW-50	GW	אַנרט	3/15/25	-05	
			×	×	×	×		1	4	\rac{1}{2}		18006	JCW-MW-18006	GW	1312	3/1/27	-04	
			×	×	×	×		-	4	\rac{1}{\sqrt{1}}		18005	JCW-MW-18005	GW	الإذا	3/7/22	-03	
			×	×	×	×		-	4	ر. د		18004	JCW-MW-18004	GW	0757	द्वीर्गि	-02	
			×	×	×	×		-	4	U <sub>1</sub>		18001	JCW-MW-18001	GW	UKSY	3/7/21	22-0150-01	
REMARKS			Alk	TDS	<del> </del>	Othe	HCI MeC	HNO H₂S0 NaO	Non	то	ID / LOCATION	FIELD SAMPLE ID/I	FIELD S	МАТ	TIME	DATE	SAMPLE ID	
□ OTHER			alinity	3	ions	al Me		O <sub>4</sub>	 B	TAL #	WP = Wipe WT = General Waste		S = Soil / General Solid O = Oil	RIX	ECTION	SAMPLE COLLECTION	LAB	
☐ INTERNAL INFO						<u>L</u>	PRESERVATIVE	RESER	Т	‡	udge		WW = Wastewater W = Water / Aquec		·	TRC		
☐ 10 CFR 50 APP. B							ERS	CONTAINERS	8		ther		MATRIX CODES:  GW = Groundwater		ter	Harold Register	COPY TO:	
□ ISO 17025											phone:		email:			Caleb Batts	SEND REPORT TO:	SE
⊠ TNI						<u> </u>				HER	□ STANDARD 図 OTHER	□ 3 DAYS	□ 24 HR □ 48 HR					
□ NPDES												ME REQUIRED:	TURNAROUND TIME REQUIRED:	Ì			SAMPLING TEAM:	SA
CA PECOINTIVEZZI.	ceded)	(Attach List if More Space is Needed)	st if Mor	ıch Li	(Atta	***************************************		egister	old R	: Har	REQUESTER: Harold Register	22-0150				Porewater Wells	Q1-2022 Weadock Porewater Wells	Q
OA BEOTHER TAIT.	ਈ 	EQUEST	YSISF	Ž	<b>.</b>					#	SAP CC or WO#:	7.	PROJECT NUMBER:			USTOMER:	SAMPLING SITE / CUSTOMER:	Do Se
Page of		<b>9</b> 2	RATORY SERVICES 517) 788-1251	<b>2</b>	SE	<b>RY</b> 8	<b>RATORY</b> 517) 788-1251		- <b>LABO</b> ]	- L., 4920		RS ENERGY CO	CONSUMERS ENERGY COMPANY 135 WEST TRAIL ST., JACKSON, M	CO		Energy Count on Us®	Consumers Energy Counton Us	35 05
						,	DDY			S	OF CUSTO	HAIN OF	(					0

										47	22-0150 Page 45 of 47	22-0						
Cal. Due Date:	Cal. L	မြိ	Temperature: 1.6-3.0 °C	peratur	Tem								11130	03-09-22	03-0	<b>P</b>	Fed	
' I		Received on Ice? Ke Yes L. No	lice?	ived or	Kece.						RECEIVED BY:	a E		DATE/IIME:	D,	/	RELINQUISHED BX:	RELIN
# 018407		]		•	;						777						7	
											T X X	TI	1400		100 CO	/ \\		<u> </u>
			S:	COMMENTS:	COM						RECEIVED BY:	RE(		DATE/TIME:	, D		RELINQUISHED BY:	RELIV
										-								
				-	_	1	+	_		$\dashv$								
																		······································
										ļ								······································
					ļ				<b></b>	<u> </u>	-		L CONTRACTOR DE LA CONT					
				×	×			1	<u> </u>	2	\$		EB-01	¥			-19	4
				×	×			-	=	2			FB-01	₩			-18	
			×	×	×		_	-	ω	4		MSD	JCW-MW-18001 MSD	GW	054	3/7/83	-17	
			×	×	×		<u> </u>	-	w	4		MS	JCW-MW-18001 MS	GW	0 <del>0</del> 554	3/7/23	-16	
			×	×	×			<b>→</b>	4	5			DUP-JCW-LF-0)	GW	1	3/ <i>6/</i> 33	-15	
			×	×	×			-	4	ν.			DUP-JCW-LF-01	GW	١	3/7/23	-14	
			×	×	×			1	4	5			MW-58	GW	1406	3/2/2	22-0150-13	25
REMARKS				Ani	┼	Othe	HCI MeC	HNC H <sub>2</sub> SC	None	то	ATION	LE ID / LOCATION	FIELD SAMPLE	MAT	TIME	DATE	SAMPLE ID	SAI
OTHER			alinity		al Mo	r		). <sub>4</sub>		ral #	Waste	WP = Wipe WT = General Waste	S = Soil / General Solid O = Oil		CTION	SAMPLE COLLECTION		
□ INTERNAL INFO			•		tals		PRESERVATIVE	ESER	PR	‡			WW = Wastewater W = Water / Aqueous Liqu			TRC		
☐ 10 CFR 50 APP. B							ERS	CONTAINERS	6				MATRIX CODES:  GW = Groundwater	MATR		Harold Register	COPY TO:	Q
□ ISO 17025											phone:		:	email:		Caleb Batts	SEND REPORT TO:	SEND
INI 🛭						<u> </u>				則	NDARD ☑ OTHER	□ 3 DAYS □ STANDARD	□ 48 HR	□ 24 HR				
□ NPDES												UIRED:	TURNAROUND TIME REQUIRED:	TUR			SAMPLING TEAM:	SAMPI
CW VECOINTIALISM.	Needed)	(Attach List if More Space is Needed)	ist if Mor	\ttach I	Â			gister	id Re	Haro	REQUESTER: Harold Register	<b>6</b>	22-0150			ewater Wells	Q1-2022 Weadock Porewater Wells	Q1-202
OA BEOUWERNER.	TED CET	ANALYSIS REQUESTED	HSISY							₩	SAP CC or WO#:		PROJECT NUMBER:	PROJ		TOMER:	SAMPLING SITE / CUSTOMER:	SAMPI
Page of		<b>9</b> 2	ICES	RV		<b>RY</b>	<b>RATORY</b> (517) 788-1251	<b>)R.</b> /	- B	. <b>L.</b> / 1920:	MPANY - CKSON, MI 4	RS ENERGY COMPANY – LA 135 WEST TRAIL ST., JACKSON, MI 49201	CONSUMERS ENERGY COMPANY – LABORATORY SERVICES 135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251	ONSU	C	<b>Energy</b> Count on Us <sup>c</sup>	Consumers Energy  Count on l	P9 36
		į					DDY	9		S	)F CU	CHAIN OF CUSTC	CH					70

22-0150 Page 46 of 47	Fed 5x 03-10-22 11:30	PET INCHIENCE: PATEUME: RECEIVED BY: Received on loc? Wes D No	RELINQUISHED BY: DATE/TIME: RECEIVED BY: COMMENTS:			+ -19 多何か cを比 W EB-01 2 1 1 x x x	-18 7 (4/2) 0分4 W FB-01 2 111 X X	-17 GW JCW-MW-18001 MSD 4 3 1 X X X	-16 GW JCW-MW-18001 MS 4 3 1 x x x	-15 GW DUP-JCW-LF-01 5 4 1 X X X X X	-14 GW DUP-JCW-LF-01 5 4 1 x x x x x	22-0150-13 GW MW-58 5 4 1 x x x x x	DATE TIME MAT FIELD SAMPLE ID / LOCATION  TO Non HNK H2SI NAO HCI Med Other Total And Total National N	S = Soil / General Solid WP = Wipe O = Oil WT = General Waste TAL # H H H H MO ONS	TRC  GW = Groundwater  UW = Wastewater  W = Wastewater  SL = Sludge  PRESERVATIVE  PRESERVATIVE		SEND REPORT TO: Caleb Batts email: phone:	□ 24 HR □ 48 HR □ 3 DAYS □ STANDARD 図 OTHER	SAMPLING TEAM: TURNAROUND TIME REQUIRED:	Q1-2022 Weadock Porewater Wells 22-0150 REQUESTER: Harold Register (Attach List if More Space is Needed)	SAMPLING SITE / CUSTOMER: PROJECT NUMBER: SAP CC or WO#: ANALYSIS REQUE	Consumers Energy  Consumers Energy  Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup> Counton Us <sup>o</sup>	CHAIN OF CUSIOUS
		es □No M&TE#: OSO											REMARKS	□ OTHER	□ INTERNAL INFO	□ 10 CFR 50 APP. B	□ ISO 17025	INT 🗵	☐ NPDES	Space is Needed) QA REQUIREMENT:		Page of	

				22-0150 Page 47 of 47		9			
Cal. Due Date: 6-3-2L	Temperature: 1.6 - 3.8 °C			7.	, U:30	03, 10-707	O O	T CI	
M&TE#: 015402	Received on Ice? ☐ Yes ☐ No N			RECEIVED BY:		ATE/TIME:	D		RELINQUISHED BY:
			,	Fed ox	(4×)	643	2/2	1	(
	COMMENTS:			RECEIVED BY:		DATE/TIME:	,		RELINQUISHED BY
	×		5 4 1		OW-57R OUT	GW	<i>0</i> 631	3  9123	-12
	×		5 4 1		MW-55	GW			-11
	× × × ×		5 4 1		MW-54R	GW	02:	3/9/85	-10
	× × × ×		5 4 1		MW-53R	GW			-09
	×		5 4 1		MW-53	GW			-08
	× × × ×		5 4 1		MW-52	GW			-07
	× × ×		5 4 1		MW-51	GW			-06
	× × ×		5 4 1		MW-50	GW			-05
	× × ×		5 4 1		JCW-MW-18006	GW			-04
	× × × ×		5 4 1		JCW-MW-18005	GW			-03
	× × × ×		5 4 1		JCW-MW-18004	GW			-02
	×		5 4 1		JCW-MW-18001	GW			22-0150-01
REMARKS	An:	H <sub>2</sub> So NaC HCl MeC Othe	Non HNC	ID / LOCATION	FIELD SAMPLE ID/L	MAT	TIME	DATE	SAMPLE ID
□ OTHER	al Me ions S alinity	H OH or		ipe eneral Waste	S = Soil / General Solid WP = V O = Oil WT = (		ECTION	SAMPLE COLLECTION	LAB
□ INTERNAL INFO		PRESERVATIVE	T					TRC	
☐ 10 CFR 50 APP. B		CONTAINERS	CONT	ther		MATH	H	Harold Register	СОРУ ТО:
□ ISO 17025				phone:	•	email:		Caleb Batts	SEND REPORT TO:
⊠ TNI				☐ STANDARD Ø OTHER	□48 HR □3 DAYS	□24 HR			
☐ NPDES					TURNAROUND TIME REQUIRED:	TUR			SAMPLING TEAM:
	(Attach List if More Space is Neede	ster	ırold Regi	REQUESTER: Harold Register	22-0150			orewater Wells	Q1-2022 Weadock Porewater Wells
OA REOUREMENT:	ANAL YSIS REQUESTED			SAP CC or WO#:	PROJECT NUMBER:	PROJ		STOMER:	SAMPLING SITE / CUSTOMER:
Page of	LABORATORY SERVICES 9201 • (517) 788-1251	<b>RATORY</b> 517) 788-1251	.ABO]	OMPANY – I ., JACKSON, MI 492	CONSUMERS ENERGY COMPANY – LA 135 WEST TRAIL ST., JACKSON, MI 49201	ONSU		Energy Count on Us <sup>c</sup>	Consumers Energy Counton
		DY	STC	OF CUST	CHAIN OF				

^



PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance
PROJECT NUMBER: _	464096.0000. Phase 3
PROJECT MANAGER:	Darby Litz
SITE LOCATION: -	2742 Weadock Hwy Essexville, MI
DATES OF FIELDWORK:	3/7/2022 TO 3/11/2022  Install Replacement Leachate Headwell and Well Decommission
-	Jake Krenz
WORK PERFORMED BY:	

All Try 3-15-2022 SIGNED DATE

CHECKED BY DATE



#### **GENERAL NOTES**

PROJECT NAME:	CEC Weadock LF: 2022 GW C	DATE: 3-7-2012	TIME ARRIVED: 0930
PROJECT NUMBER:	464096.0000. Phase 3	AUTHOR: Jake Krenz	TIME LEFT: 1730
		WEATHER	

		WEA	THER			
TEMPERATURE: 31	of of wind	5-10 M	PH	VISII	BILITY: SNOW	y/low
		WORK / SAMPLI	NG PERFO	RMED		
in stalled Details	L17-103	R, see	50B	Book	pages	For
					,	

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKES
NA	NA

		COMMUNICATION
NAME	REPRESENTING	SUBJECT / COMMENTS
Inson O'Dell	CEC	Sign in but / safety orientation
Jon Gneth	CEC	16
DLitz	TRC	Site updates

WASTE MATRIX	QUANTITY	COMMENTS
soil cuttings	NM	left by well and spread out

And	They 3.	-15-22	Aw	8-23-22
SIGNED		DATE	CHECKED BY	DATE



#### **GENERAL NOTES**

PROJECT NAME:	CEC Weadock LF: 2022 GW 0	DATE: 3-8-2022	TIME ARRIVED: 0730
PROJECT NUMBER:	464096.0000. Phase 3	AUTHOR: Jake Krenz	TIME LEFT: 1815

	2772	V	/EATHER			
EMPERATURE:	23 °F	WIND: 10-15	MPH	VISIBILITY:	clea	
		WORK / SAM	PLING PERFORM	ED		
Decomm	iss. bned	monitoring	wells	Ow-63	ard	LH-103
Sevel of	red	LH-103R				
See	Joh	book for	betails			

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
NA	ALA
70.1	7017

		COMMUNICATION
NAME	REPRESENTING	SUBJECT / COMMENTS
J. O'Dell	CEC	sign in/out
D. Litz	TRC	site updates
J.R. Register	CEC	site updates / Drilling and sampling plan
Lori Bab cock	EGLE	Drilling I sampling plan

	INVESTIG	GATION DERIVED WASTE SUMMARY
WASTE MATRIX	QUANTITY	COMMENTS
well Material	NM	Disposed of in dumpster on site
proge unter	NM	purged to ground

SIGNED DATE CHECKED BY DATE



#### **GENERAL NOTES**

PROJECT NAME:	CEC Weadock LF: 2022 GW 0	DATE: 3-10- 22	TIME ARRIVED: 0600
PROJECT NUMBER:	464096.0000. Phase 3	AUTHOR: Jake Krenz	TIME LEFT: 1715

	WEATHER	
TEMPERATURE: 26 °F	WIND: 10-15 MPH	VISIBILITY: Cleas
	WORK / SAMPLING PE	ERFORMED
collected Sample	from LH-16	03R
finished concrete	work and	labeled LH-103R
See Job Book	for details	
		labeled LH-103K

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
A/A	A LA
10.13	7000

NAME	REPRESENTING	SUBJECT / COMMENTS
J. 0'Dell	CEC	Sign in lowt
N. L.42	TRE	side updates

WASTE MATRIX	QUANTITY	COMMENTS
Durge water	NM	purged to ground

SIGNED Jary 3-15-22
DATE

CHECKED BY

3-23-22

DATE



#### **EQUIPMENT SUMMARY**

PROJECT NAME: CEC Weadock LF: 20	SAMPLER NAME: Jake Krenz
PROJECT NO.: 464096.0000. Phase	
WATER LEVEL MEASUREMENTS COLLECTED V	WITH:
HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
PRODUCT LEVEL MEASUREMENTS COLLECTE	D WITH:
NA	NA
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
DEPTH TO BOTTOM OF WELL MEASUREMENTS	S 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)
NA	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 ☐ P	POTW POLYTANK OTHER
DECONTAMINATION AND FIELD BLANK WATER	R SOURCE
STORE BOUGHT	LABORATORY PROVIDED
POTABLE WATER SOURCE	DI WATER SOURCE

·> TRC

#### LOG OF SOIL BORING

						2022-GW-Compliance SOIL BORING ID: LH -103 R	
1000			7.1	4095.00	100,000	The second secon	1
OGGED BY: Jake Krenz  ROJECT LOCATION: 2742 Weadock Hwy							FACE ELEV.: NA
					dock Hw		E STARTED: 3-7-22
RILL	ED BY:	S	teer	ns		DRILLER NAME: Jim Gryska: DAT	E COMPLETED: 3-7-2)-
NO.	TYPE	%	BLOWS	PID	DEPTH	VISUAL CLASSIFICATION AND OBSERVATIONS	COMMENT
1	<b>ζ</b> ς	100	3 6 8	AIN	1	Sandy they no they some on send, aren (10)	(K \$/1)
	4		70		_7_		
5	SS	100		ΝA	3		
					~L1		
}	55	100		NA	58	Ash, En-med sured sizea, Aluck, Dry, losse	
		60		MA	-6	Ash, for my server sizea, shele, Dry, losse	
1					-6	The state of the s	
1	₹\$ \$\$	THOOD THOO		ии	-6	WATER LEVEL OBSERVATION	DNS
RILL	\$	THOO THO	250	nin	-6		The Walder



#### LOG OF SOIL BORING

NO.	TYPE	%	BLOWS	PID	DEPTH	VISUA	L CLASSIFICAT	TION AND OBSE	RVATIONS	COMMEN
6	ς5	80	NA	414	of A 17	very Dar	r gray	e 11.0°	D65.	
-		_			- 12					
7	55	20	NA	HN	13-					
_		_			- n					
8	44	qo	NA	49	15					
	_	-	=		Ve					
Q	\$ <sup>5</sup> 5	So.	NĀ	t.P.	7					
موشقت		-	-	_	-18					
g <sub>j</sub>	777	多名父	NA	NR	1/1					
		(X	_	_	-76					
11	ch	O	NA	NA	37					
				_	-32					



#### **LOG OF SOIL BORING**

24 Chapters chart few title to made sound, 100 mars plat, from (brests), well (here, bry)  Alter and went book fam, for organic  The west of the sound of the sou	Э.	TYPE	%	BLOWS	PID	DEPTH	VISUAL CLASSIFICATION AND OBSERVATIONS COMMENT
1 5 0 NA NA 37 A towart Q 28"	7	55	10	NA	NA		to wast & 3t, BC2
1 (5 00 NA NA 27 A 10 wet 6 28.	1	47	00,	NA	N.A	J.2 /0 ~	
15 3 100 NA NA 24 10	الم	\$	00	NA	NA	37 (	
10	,5	3	100	NA	NA		to wet e 28"
						10	EOB e 30'BGS
							15-22 Au )- 2)-77 CHECKED DATE

## TRC WELL CONSTRUCTION DIAGRAM

PROJ. NAME: GEG+	Carn BAP/LI. 2022 GW Compliance		WELL ID:	LH-103R	
PROJ. NO: 46409	5.0001 F DATE INSTALLED: 3 - 7-22	NSTALLED BY: Jake Krenz	C	CHECKED BY: AL	1 2.23.22
ELEVATION	DEPTH BELOW OR ABOVE GROUND	CASING AN	ND SCREEN	DETAILS	
(BENCHMARK: USGS)	OUDELOS (SSSE	TYPE OF RISER:	cheduk	40 prc	
ΔιΔ	1 3 TOD OF 010HO	PIPE SCHEDULE:	40		
NA F	+3 TOP OF CASING	The state of the s	rended	October	_
				0,1	-
			vone		-
NA A	0.0 GROUND SURFACE	SCREEN TYPE:			-
		SCR. SLOT SIZE: 10	Slot		
	CEMENT SURFACE PLUG		,		
		BOREHOLE DIAMETER:		FROM O TO	
	GROUT/BACKFILL MATERIAL			FROM NA TO	1
SER PIPE LENGTH	Bentonite Sturry	SURF. CASING DIAMETER:		FROM TO	-
25 PER PIPE LEN	GROUT/BACKFILL METHOD		IN.	FROM V 10	V FT.
A STATE OF THE STA	- Mexamic	WELL	DEVELOPI	MENT	
	2 I GROUT	DEVELOPMENT METHOD:	Swa	el Purge	
	and the state of t	TIME DEVELOPING:		HOURS	
	Hole play	WATER REMOVED:	200	GALLONS	
	23 BENTONITE SEAL	WATER ADDED:		GALLONS	
		WATER CLARITY BI	ECORE / AET	ER DEVELOPMEN	IT.
W +	25 TOP OF SCREEN	WATER GEARITY DI			
1.		CLARITY BEFORE:	very T		
SCREEN LENGTH	FILTER PACK MATERIAL	COLOR BEFORE:	Black		
	wigher med semil	CLARITY AFTER:	clear		
NA S	30 BOTTOM OF SCREEN	COLOR AFTER:	cheen		_
	2 BOTTOM OF BORLET	ODOR (IF PRESENT):	none	2	
	70 BOTTOM OF FILTER PACK				
		WATER	R LEVEL SUN	MARY	
	N BENTONITE PLUG	MEASUREMENT (F		DATE	TIME
		DTB BEFORE DEVELOPING:		T/PVC 7-7-23	1628
	BACKFILL MATERIAL	DTB AFTER DEVELOPING:		T/PVC 3-6-22	
		SWE BEFORE DEVELOPING:	0	T/PVC 3-7-22	1628
- IA	150000000	SWE AFTER DEVELOPING:	24.85	T/PVC 3-10-22	0610
NA	30 HOLE BOTTOM	OTHER SWE:		T/PVC	
IOTEC.		OTHER SWE:	TIVE CASING	T/PVC	
IOTES:	provide luck for	7.756.423	(0.000 C+ 0.000 C)	477 244 144 (2)	D NO
CEC TO	TO TOO TOO	PERMANENT, LEGIBLE WEL			□ NO
Coo U		PROTECTIVE COVER AND L  LOCK KEY NUMBER:	OCK INSTAL	LED! ME TES	∐ ио



#### MONITORING WELL DECOMMISSIONING LOG

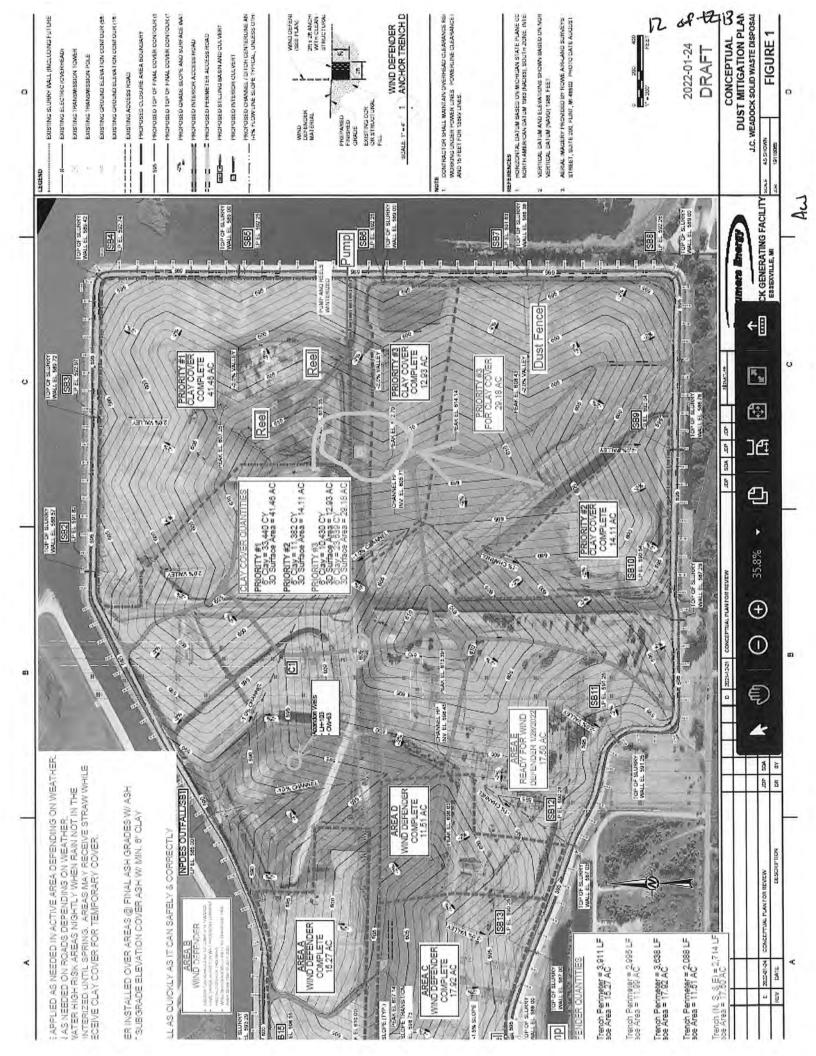
PROJECT NAME: CEC Karn BAP/LI: 2022 GW Compl	monitoring well in: LH -	103
PROJECT NUMBER: 464095.0001 PhaDATE: 3 - 2 - 2		LOCATION COORDINATES:
OBSERVED BY: Jake Krenz	See figure	N:
DRILLING CONTRACTOR: Stewns	7.0	E:
CREWCHIEF: Jim Gryska	TOP OF CASING ELEV .: NA	SURFACE ELEV.: _N/\frac{1}{2}
PROTECTIVE COVER TYPE: STICK-UP PROTECTIVE COVER DIAMETER: 4" 8" 9" WELL MATERIAL: PVC SS WELL CASING DIAMETER: 1" 2" 4" 0	FLUSH MOUNT  TRAF. BOX OTHER	rw: 10.15 T/ PVC
GROUTING PROCEDURE: F.II from above grout type: Bentonite chips grout MIX:  GROUT INTERVAL: 9.6 FT-BGS TO 0	NOTES: 3.6' Stick w/	
BENTONITE SEAL: SEAL INTERVAL:  Note: The seal interval:  Note: The se	ET DOS	
And Pay 3-15-2	2 Å. \	)-23-22
SIGNED DATE	CHECKED	DATE



REVISED 04/2019

### MONITORING WELL DECOMMISSIONING LOG

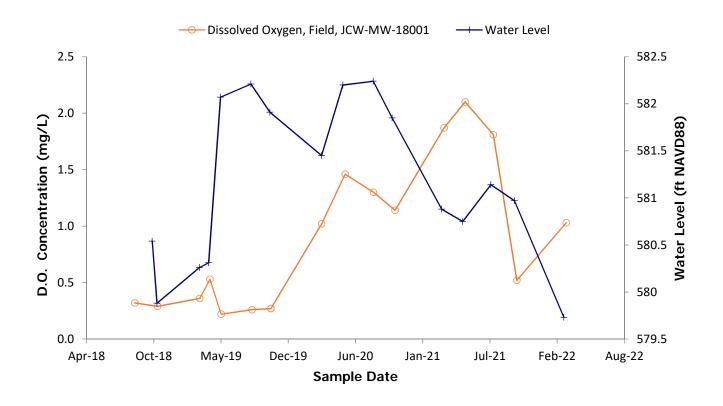
EV::WA
EV.:
EV.: _WA
EV.: _WA
T/ PVC
T/ PVC
TI
2
2





# Appendix G Alternate Source Demonstration Supporting Information

Figure G1: Time Series Plots for Sulfate at JCW-MW-18001 ASD



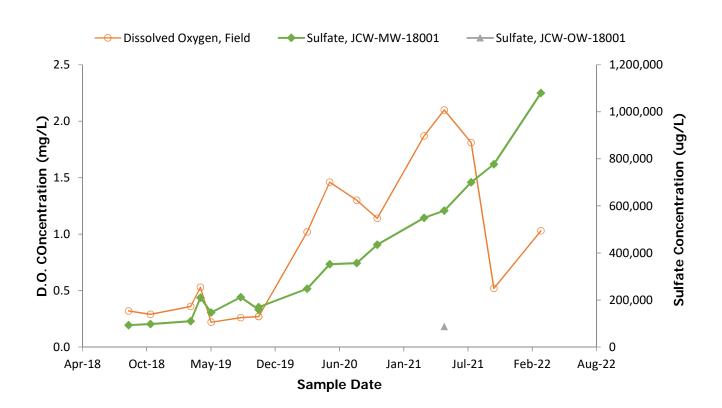


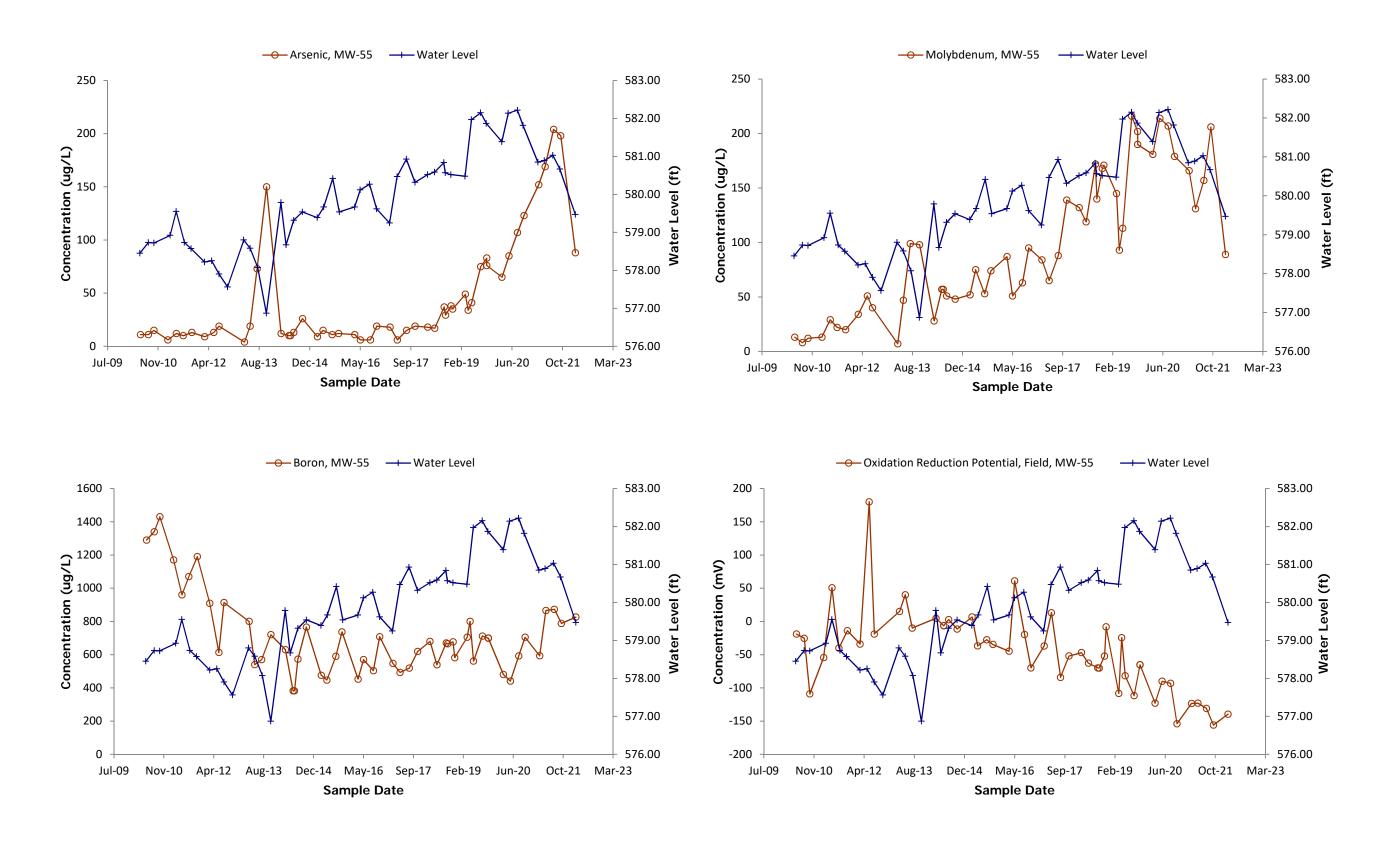
Table G2
Summary of Groundwater Sampling Results Near MW-55
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

Constitue	nt	Arsenic	Boron	Molybdenum	Oxidation Reduction Potential, Field
Unit		ug/L	ug/L	ug/L	mV
Outside Slurry Wall					
	5/11/2021	169	866	131	-123.0
MW-55	8/3/2021	204	873	157	-131.0
IVIVV-00	10/12/2021	198	788	206	-156.0
	3/7/2022	88	826	89	-139.5
Inside Slurry Wall					
	5/11/2021	10	1,850	< 5	-66.3
OW-55	8/3/2021	15	1,890	< 5	-82.1
077-33	10/12/2021	10	2,300	< 5	-147.0
	3/7/2022	6	2,090	< 5	-120.5
	5/11/2021	< 1	689	< 5	92.0
JCW-OW-18004	8/3/2021	1	801	< 5	148.3
JCVV-0VV-10004	10/12/2021	1	857	< 5	-20.0
	3/7/2022	1	705	< 5	-65.8
	5/11/2021	29	12,200	59	39.9
LH-104	8/3/2021	21	9,410	10	-27.8
	10/7/2021	26	11200	40	-119.6

#### Notes:

ug/L - micrograms per liter; mV - millivolts

Figure G2: Time Series Plots for MW-55 ASD





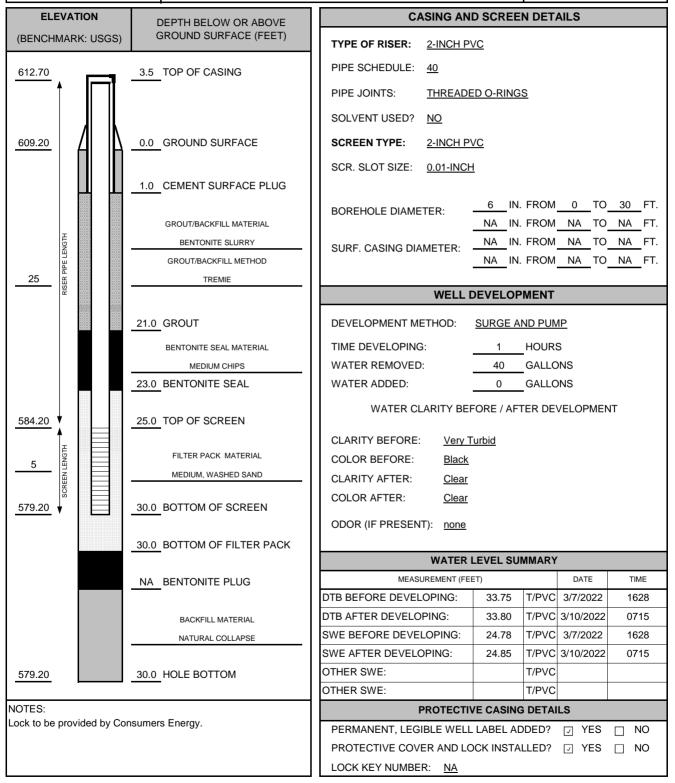
## Appendix H Well Decommissioning and Installation Records

	100		3		WEL	L CONST	RUCTION L	.OG						
			RC							WEL	L N	O. LH	I-103R	
													1 of 1	
Facility/Proje							Date Drilling Star		Date Drilling		ted:		ect Number:	
Drilling Firm:		Wea	dock LF: 2	2022 GW Compliance		e	3/7/202		3/7 Elevation (ft)	/2022	Danth	(ft bgs)	464096.0000 Borehole Dia. (in)	
•	tearns	Drilli	na	Drilling Meth		Augor	Surface Elev. (ft) 609.2		612.70	Total	30.0	,	6	
Boring Locat								,	312.70	Drillin		pment:	0	
N: 780127.3 E							Logged By - Jak Driller - Jim Grys			CME 850 XR				
Civil Town/C			County:		State:		Water Level Obs While Drilling: [				(ft, bgs)			
	exville		В	ay		MI	After Drilling: [	Date/Time	3/10/22 00:	00 🛂	Depth	(ft, bgs)	24.85	
SAMPLE	-													
NUMBER AND TYPE RECOVERY (%)	BLOW COUNTS	DEPTH IN FEET				THOLOGIC SCRIPTION			nscs	GRAPHIC LOG	WELL DIAGRAM	(	COMMENTS	
1 SS 100		-		<b>CLAY</b> mo 10YR 5/3),		some fine sa	and, low plastic	city,						
2 SS 100	_	-							CL					
3 SS 100	-	5-	ASH fin	ie sand siz	ed grains	, black (10Yi	R 2/1), dry, loc	ose.						
60 5S		-												
5 SS 100		10-												
7 80		_	Change surface.		rk gray (1	0YR 4/1) at	11 feet below	ground						
8 90		15-												
9 90	_	-												
10 40		-												
11 80		20												
12 SS 80		_	Change	to moist a	it 22 feet k	pelow ground	d surface.							
13 SS 100		25 —	plasticit	y, brown (1	10YR 5/3)	, dry, mediur			CL					
14 SS 100		_	loose.	ie sand siz	ea grains	, very dark g	ray (10YR 3/1	), wet,						
15 SS 100		30-	_				_							
		-	End of b	ooring at 30	U feet beld	ow ground su	urface.							
Signature:	1.0.	. ()	V /			Firm: TRC 1540 E	isenhower Pla	ce Ann	Arbor, MI 4	8108		Phor	ne 734-971-708	



# **TRC** WELL CONSTRUCTION DIAGRAM

PROJ. NAME:	CEC Karn BAP	P/LI: 2022 GW Compliance	WELL ID:	LH-103R		
PROJ. NO:	464096.0000	DATE INSTALLED: 3/7/2022	INSTALLED BY:	Jake Krenz		CHECKED BY:Jen Reed





# MONITORING WELL DECOMMISSIONING LOG

PROJECT NUMBER: 464096.0000 DATE: 03/08/2022 LOCATION:  OBSERVED BY: Jake Krenz  DRILLING CONTRACTOR: Stearns Drilling  CREW CHIEF: Jim Gryska  TOP OF CASING ELEV.: NA SURFACE ELEV.: NA  PROTECTIVE COVER TYPE: STICK-UP   FLUSH MOUNT   TRAF. BOX   OTHER PROTECTIVE COVER DIAMETER: 4"   8"   9"   10"   12"   OTHER None  WELL MATERIAL: PVC   SS   IRON   GALVANIZED STEEL   OTHER	
DRILLING CONTRACTOR: Stearns Drilling  CREW CHIEF: Jim Gryska  TOP OF CASING ELEV.: NA SURFACE ELEV.: NA  PROTECTIVE COVER TYPE: STICK-UP   FLUSH MOUNT   TRAF. BOX   OTHER  PROTECTIVE COVER DIAMETER:   4"   8"   9"   10"   12"   OTHER None  WELL MATERIAL:   PVC   SS   IRON   GALVANIZED STEEL   OTHER	
DRILLING CONTRACTOR:         Stearns Drilling         E: NA           CREW CHIEF:         Jim Gryska         TOP OF CASING ELEV.: NA         SURFACE ELEV.: NA           PROTECTIVE COVER TYPE:         STICK-UP         FLUSH MOUNT         TRAF. BOX         OTHER           PROTECTIVE COVER DIAMETER:         4"         8"         9"         10"         12"         OTHER None           WELL MATERIAL:         PVC         SS         IRON         GALVANIZED STEEL         OTHER	
PROTECTIVE COVER TYPE:         STICK-UP         FLUSH MOUNT         TRAF. BOX         OTHER           PROTECTIVE COVER DIAMETER:         4"         8"         9"         10"         12"         OTHER None           WELL MATERIAL:         PVC         SS         IRON         GALVANIZED STEEL         OTHER	
PROTECTIVE COVER DIAMETER:         □ 4" □ 8" □ 9" □ 10" □ 12" ☑ OTHER None           WELL MATERIAL:         ☑ PVC □ SS □ IRON □ GALVANIZED STEEL □ OTHER	
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER	
WELL CLONE BULLETER	
WELL CASING DIAMETER: 1" 2" 4" 6" 8" OTHER	
WELL SCREEN MATERIAL: ☐ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER	
WELL SCREEN LENGTH: ☐ 5-FT ☐ 10-FT ☐ UNKNOWN☐ OTHER <b>DTW</b> : 10.15	PVC
WELL SCREEN SLOT SIZE: ☐ 0.01" ☐ 0.02" ☐ UNKNOWN☐ OTHER <b>DTB:</b> 12.6 T/	PVC
DECOMMISSIONING PROCEDURE PULL WELL AND GROUT	
NOTES:	
Pulled well casing and filled remaining hole with bentonite chips.	
GROUTING PROCEDURE: FILL FROM ABOVE NOTES:	
GROUT TYPE: NA 3.6 feet of stick up.	
GROUT MIX: NA	
GROUT INTERVAL: NA FT-BGS TO NA FT-BGS	
BENTONITE SEAL: MEDIUM CHIPS SEAL INTERVAL: 9.6 FT-BGS TO 0 FT-BGS	
ADDITIONAL COMMENTS:	
A. Or	
Ind Vand 4/27/2022 Al27/2022	



# MONITORING WELL DECOMMISSIONING LOG

	Weado	ck LF: 2	2022	GW C	Compl	iance	MONITORING WELL	. ID:	OW-63		
PROJECT NUMBER: 4640	96.0000	DA	TE:	03/08	/2022	!	LOCATION:			LOCATION CO	ORDINATES:
OBSERVED BY: Jake	Krenz	•								N: NA	
DRILLING CONTRACTOR:	Stearr	ns Drilli	ng				Weadock Landfill			E: NA	
CREW CHIEF:	Jim G	ryska					TOP OF CASING ELEV	'.: <u>NA</u>		SURFACE ELE	:V.: <u>NA</u>
PROTECTIVE COVER TYPE:	<b>V</b>	STICK	-UP		□ F	LUSH MOUN	IT 🗆 TRAF. BOX	□ OTHER	!		
PROTECTIVE COVER DIAMET	ER:	4" □	8"	□ 9"	□ 1	0" 🗆 12" 🗹	OTHER None				
WELL MATERIAL:	7	PVC		□ ss	<b>S</b> [	] IRON □	GALVANIZED STEEL	□ OTHER			
WELL CASING DIAMETER:		1" 🗹	2"	□ 4"	□ 6	" 🗆 8" 🗆	OTHER				
WELL SCREEN MATERIAL:		PVC		□ ss			GALVANIZED STEEL				
WELL SCREEN LENGTH:							OTHER		DTW:	<u>12.15</u>	T/ PVC
WELL SCREEN SLOT SIZE:	7	0.01"		0.02"		INKNOWN□	OTHER		DTB:	20.93	T/ PVC
DECOMMISSIONING PROC	EDURE	PULL	WEI	LL AN	D GR	OUT					
NOTES:											
Pulled well casing and fille	d remai	ning ho	le wi	ith ben	itonite	chips.					
GROUTING PROCEDURE:		FILL	FROI	м авс	OVE		NOTES:				
GROUTING PROCEDURE: GROUT TYPE: NA		FILL F	FROI	M ABC	OVE		NOTES: 7.2 feet of stick up.				
GROUT TYPE: NA GROUT MIX: NA											
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N	A FT	-BGS	TO			T-BGS					
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI	A FT JM CHIF	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS		NA	\ F	T-BGS T-BGS					
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA	\ F						
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA 0	\ F	T-BGS		d		4/27/20	22
GROUT TYPE: NA GROUT MIX: NA GROUT INTERVAL: N BENTONITE SEAL: MEDI SEAL INTERVAL: 13	A FT JM CHIF 73 FT	-BGS	то	NA 0	F F	T-BGS		d		4/27/20 DATE	22



# May 2022 Assessment Monitoring Data Summary and Statistical Evaluation

JC Weadock, Bottom Ash Pond CCR Unit

**Essexville**, Michigan

July 2022

Darby Litz
Hydrogeologist/Project Manager

**Prepared For:** 

Consumers Energy Company

**Prepared By:** 

TRC 1540 Eisenhower Place Ann Arbor, Michigan 48108

Kristin Lowery, E.I.T. Project Engineer



#### **TABLE OF CONTENTS**

1.0	Intro	duction	.1
	1.1	Program Summary	.1
	1.2	Site Overview	.3
	1.3	Geology/Hydrogeology	.3
2.0	Grou	ındwater Monitoring	.6
	2.1	Monitoring Well Network	.6
	2.2	May 2022 Assessment Monitoring	.6
		2.2.1 Groundwater Flow Rate and Direction	. 7
		2.2.2 Data Quality	. 7
3.0	Asse	essment Monitoring Statistical Evaluation	3.
	3.1	Establishing Groundwater Protection Standards	3.
	3.2	Data Comparison to Groundwater Protection Standards	3.
4.0	Cond	clusions and Recommendations1	C
5.0	Refe	rences1	11
TAB			
Table Table		Summary of Groundwater Elevation Data: May 2022 Summary of Field Parameter Results: May 2022	
Table		Summary of Field Farameter Results. May 2022  Summary of Background Well Groundwater Sampling Results (Analytical): May 2022	
Table	e 4	Summary of Groundwater Sampling Results (Analytical) – JC Weadock Bottom Ash Pond: May 2022	
Table	5	Summary of Groundwater Protection Standard Exceedances – May 2022	
FIGL	JRES		
Figur		Site Location Map	
Figur Figur		Site Map Potentiometric Surface Map – May 2022	
APP	ENDI	CES	

Appendix A	Data Quality Reviews
Appendix B	Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event
Appendix C	Laboratory Analytical Reports



#### 1.0 Introduction

On April 17, 2015, 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), as amended. Standards for groundwater monitoring and corrective action codified in the CCR Rule (40 CFR 257.90 – 257.98) apply to the JC Weadock Bottom Ash Pond CCR Unit (Weadock Bottom Ash Pond).

Consumers Energy is continuing assessment monitoring in accordance with §257.95 of the CCR Rule for the Weadock Bottom Ash Pond in Essexville, Michigan (Figure 1). This monitoring report has been prepared to provide the summary of the May 2022 assessment groundwater monitoring results, data quality review, and statistical data evaluation for the Weadock Bottom Ash Pond groundwater monitoring system.

#### 1.1 Program Summary

Groundwater monitoring for the Weadock Bottom Ash Pond commenced after the installation of the monitoring well network in December 2015 to establish background conditions. Detection monitoring was initiated on October 17, 2017 in conformance with the self-implementing schedule in 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-15010;
- Calcium at JCW-MW-15009;
- Field pH at JCW-MW-15009 (low), JCW-MW-15010 (high), JCW-MW-15028 (high); and
- Sulfate at JCW-MW-15009.

On April 25, 2018, Consumers Energy entered assessment monitoring upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. On January 14, 2019, Consumers Energy provided notification that beryllium and lithium were present at statistically significant levels above the Groundwater Protection Standards (GWPSs) in one of the downgradient monitoring wells (JCW-MW-15009) at the Weadock Bottom Ash Pond. The notification of the GWPS exceedance was followed up with a Response Action Plan Submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on March 15, 2019 laying out the preliminary understanding of water quality and actions that were underway to mitigate or eliminate unacceptable risk associated with the identified release from the CCR unit. The Assessment of Corrective Measures (ACM) (TRC, September 2019) was initiated on April 14, 2019 and submitted on September 11, 2019 in accordance with the schedule in §257.96 and the requirements of the Response Action Plan.



The ACM documents that the groundwater nature and extent has been defined, as required in §257.95(g)(1). Although site-specific constituents of concern (COCs) (i.e., arsenic [Weadock Landfill], beryllium and lithium [Weadock Bottom Ash Pond]) have been identified in groundwater monitoring locations at concentrations exceeding their respective GWPS, COCs 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.

Evaluation of groundwater under the CCR Rule focuses on the following constituents that are collected unfiltered in the field:

CCR Rule Moni	toring Constituent	ts				
Appendix III	Appendix IV					
Boron	Antimony	Mercury				
Calcium	Arsenic	Molybdenum				
Chloride	Barium	Radium 226/228				
Fluoride	Beryllium	Selenium				
рН	Cadmium	Thallium				
Sulfate	Chromium					
Total Dissolved Solids (TDS)	Cobalt					
	Fluoride					
	Lead					
	Lithium					

Prior to remedy selection, Consumers Energy will also collect a sufficient number of samples to evaluate Michigan state-specific constituents as follows:

Additional Monitoring Constituents (Michigan Part 115/PA 640¹)							
Detection Monitoring	Assessment Monitoring						
Iron	Copper						
	Nickel						
	Silver						
	Vanadium						
	Zinc						

<sup>&</sup>lt;sup>1</sup> On December 28, 2018, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management). The December 2018 amendments to Part 115 were developed to provide the State of Michigan oversight of CCR impoundments and landfills and to better align existing state solid waste management rules and statutes with the CCR Rule.



Consumers Energy will continue to evaluate corrective measures for the Weadock Bottom Ash Pond per §257.96 and §257.97 and is continuing semiannual assessment monitoring in accordance with §257.95.

#### 1.2 Site Overview

The Weadock Bottom Ash Pond is located within the JC Weadock Power Plant site, which is located south of the DE Karn Power Plant site, east of the Saginaw River, west of Underwood Drain and Saginaw Bay, and north of Tacey Drain and agricultural land (Figure 1). The Weadock Bottom Ash Pond is located immediately west of the JC Weadock Solid Waste Disposal Area (*i.e.* Weadock Landfill) and outside of the soil-bentonite slurry wall (Figure 2). The Weadock Landfill is being monitored in accordance with the EGLE-approved *Landfill Hydrogeological Monitoring Plan*, JC Weadock Solid Waste Disposal Area (February 2021). In addition to the Weadock Bottom Ash Pond and Weadock Landfill, 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 and continued to operate through April 15, 2016.

The Weadock Bottom Ash Pond was formerly the primary settling/detention structure for the National Pollutant Discharge Elimination System (NPDES) Treatment System prior to discharge and characterized as an existing CCR surface impoundment. Consumers Energy ceased hydraulic loading to the Weadock Bottom Ash Pond in April 2018 and has allowed the area to dewater by gravity. The active dewatering and excavation work was completed between February and July 2020. The excavation extended to six inches below known CCR elevations established from previous investigations. Excavated CCR has been placed in the neighboring Weadock Landfill that is constructed with of a fully encapsulation soil-bentonite slurry wall keyed into a competently confining clay unit. The Weadock Bottom Ash Pond has been restored by backfilling and grading the surface with clean fill in accordance with the plan to promote stormwater drainage, minimize ponding of surface water, and to reduce the potential of infiltration and migration of residual arsenic and any future COCs. Consumers Energy submitted for review and approval, J.C. Weadock Generating Facility Bottom Ash Pond CCR Removal Documentation Report (Weadock Bottom Ash Pond Closure Report) on August 26, 2020 to satisfy requirements for completing the removal of solid waste which rendered the need for a solid waste operating license unnecessary. EGLE approved the removal documentation report satisfying state requirements to close on December 1, 2020. Groundwater conditions post-CCR removal continue to be monitored.

#### 1.3 Geology/Hydrogeology

The majority of Weadock Bottom Ash Pond area is comprised of surficial CCR and sand fill. USGS topographic maps and aerial photographs dating back to 1938, 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.



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 to 75 ft bgs. A sandstone unit, which is part of the Saginaw formation, was 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 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 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 Bottom Ash Pond and Weadock Landfill are bounded by several surface water features (Figure 1): 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 the upper aquifer is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay. In general, shallow groundwater is encountered at a similar or slightly higher elevation relative to the surrounding surface water features. The shallow groundwater flow direction in the vicinity of the Weadock Bottom Ash Pond is to the north toward the discharge channel and to the east toward the Saginaw River. Historical groundwater flow beneath the Weadock Landfill was directed north to the discharge channel due to the bentonite/soil slurry wall. Originally, the slurry wall enclosed the historical fly ash disposal area with the exception of a small segment along the perimeter dike that is designed to vent along the discharge channel immediately upgradient from the NPDES external outfall to prevent water from building up within the facility. In July 2018, this vent was closed and the slurry wall reduced porewater flux around the entire perimeter of the landfill. Following the closure of the vent, the static water level elevations inside of the slurry wall are generally significantly different (>1 ft) than static water levels outside of the slurry wall, which demonstrates the presence of a low permeability feature between the well pairs.



In previous investigations, bedrock groundwater was generally encountered around 578 ft (NAVD88), which is several feet lower than the shallow groundwater. Groundwater flow direction was generally to the northeast under a very shallow gradient. Given the different groundwater flow regime in the bedrock than the shallow saturated unit, bedrock wells near the surface water bodies are several feet below the surface water elevation. Based on the fact that the shallow sand and the bedrock are separated by over 50 ft of clay, the bedrock unit does not appear to be hydraulically connected to the shallow sand.



### 2.0 Groundwater Monitoring

#### 2.1 Monitoring Well Network

In accordance with 40 CFR 257.91, Consumers Energy established a groundwater monitoring system for the Weadock Bottom Ash Pond, which consists of eight monitoring wells (four background monitoring wells and four downgradient monitoring wells) that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

Groundwater around the Weadock Bottom Ash Pond was characterized as radial based on the eight initial background sampling events prior to commencing detection monitoring; therefore, the four downgradient wells (JCW-MW-15007, JCW-MW-15009, JCW-MW-15010, and JCW-MW-15028) were installed in the accessible areas along the perimeter of the Weadock Bottom Ash Pond. Following the cessation of hydraulic loading, groundwater near the Weadock Bottom Ash Pond continues to flow to the north toward the discharge channel and to the west near the Saginaw River; therefore, the compliance wells continue to accurately represent the quality of groundwater passing the waste boundary that ensures detection of groundwater contamination such that all potential contaminant pathways are monitored.

Four monitoring wells located south of the Weadock Bottom Ash Pond provide data on background groundwater quality that has not been impacted by a CCR unit (MW-15002, MW-15008, MW-15016, and MW-15019). Analysis for the establishment of these wells as background is detailed in the *Groundwater Statistical Evaluation Plan* (Stats Plan) for the Weadock Bottom Ash Pond, dated October 17, 2017.

#### 2.2 May 2022 Assessment Monitoring

Per §257.95, all wells in the CCR unit monitoring program must be sampled at least semiannually. TRC conducted the first semiannual assessment monitoring event of 2022 for Appendix III and IV constituents at Bottom Ash Pond CCR Unit in accordance with the *JC Weadock Monitoring Program Sample Analysis Plan* (TRC, 2018) (SAP). The semiannual assessment monitoring event was performed on May 2 through 10, 2022. The Bottom Ash Pond downgradient monitoring well network (JCW-MW-15007, JCW-MW-15009, JCW-MW-15010, and JCW-MW-15028), and background monitoring wells (MW-15002, MW-15008, MW-15016, and MW-15019) were sampled during the semiannual assessment monitoring event. The locations of the monitoring wells are depicted on Figure 2.

The May 2022 sampling event consisted of collecting static water level measurements from the Weadock Bottom Ash Pond groundwater monitoring system. Static water level measurements were also collected at other site wells to support preparation of a groundwater contour map. Static water elevation data are summarized in Table 1 and groundwater elevation data are shown on Figure 3. Monitoring wells were purged with peristaltic pumps utilizing low-flow sampling methodology. Field parameters were stabilized at each monitoring well prior to collecting groundwater samples. Stabilized field parameters for each monitoring well are summarized in Table 2.



Eurofins TestAmerica Inc. (TestAmerica) in St. Louis, Missouri, provided the radiological analysis of the groundwater samples. The remaining Appendix III and IV constituents were analyzed by Consumers Energy Laboratory Services in Jackson, Michigan in accordance with the SAP. The analytical results for the background monitoring wells are summarized in Table 3. The analytical results for the Weadock Bottom Ash Pond downgradient monitoring wells are summarized in Table 4. Analytical results from the May 2022 monitoring event are included in the attached laboratory reports (Appendix C).

#### 2.2.1 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the May 2022 assessment monitoring event are provided in Table 1. These data were used to construct the groundwater contour map (Figure 3). Groundwater elevations at the Weadock site are generally within the range of 580 to 586 feet above mean sea level (ft NAVD88) and groundwater is typically encountered at a similar or slightly higher elevation relative to the surrounding surface water features measured by the NOAA gauging station data.

Figure 3 shows that groundwater near the Weadock Bottom Ash Pond continues to flow to the north toward the discharge channel and to the west near the Saginaw River. The average hydraulic gradient throughout the bottom ash pond area during the May 2022 event is estimated at 0.0053 ft/ft. The gradient was calculated using the monitoring well pairs JCW-MW-15028/JCW-MW-15009, JCW-MW-15007/JCW-MW-15010, and MW-15016/MW-15002. Using the mean hydraulic conductivity of 16 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.3, the estimated seepage velocity observed in May 2022 is 0.28 ft/day or 100 ft/year. The general flow direction is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient monitoring wells are appropriately positioned to detect the presence of Appendix III/IV constituents that could potentially migrate from the Weadock Bottom Ash Pond.

#### 2.2.2 Data Quality

Data was evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. Analytical data were found to be usable for assessment monitoring and were generally consistent with previous sampling events. The Data Quality Reviews are included as Appendix A.



### 3.0 Assessment Monitoring Statistical Evaluation

Assessment monitoring is continuing at the Weadock Bottom Ash Pond while corrective measures are further evaluated in accordance with §257.96 and §257.97 as outlined in the ACM. The following section summarizes the statistical approach applied to assess the May 2022 groundwater data in accordance with the assessment monitoring program.

#### 3.1 Establishing Groundwater Protection Standards

The GWPSs are used to assess whether Appendix IV constituent concentrations are present in groundwater at unacceptable levels as a result of CCR Unit operations by statistically comparing concentrations in the downgradient wells to the GWPSs for each Appendix IV constituent. In accordance with §257.95(h) and the Stats Plan, GWPSs were established for the Appendix IV constituents following the preliminary assessment monitoring event as documented in the Groundwater Protection Standards technical memorandum (Appendix C of the 2018 Annual Groundwater Monitoring Report (TRC, January 2019). The GWPS is established as the higher value of the EPA Maximum Contaminant Level (MCL) or statistically derived background level for constituents with MCLs and the higher of the EPA Regional Screening Levels (RSLs) or background level for constituents without an established MCL.

#### 3.2 Data Comparison to Groundwater Protection Standards

The compliance well groundwater concentrations for Appendix IV constituents were compared to the GWPSs to determine if a statistically significant exceedance had occurred in accordance with §257.95. Consistent with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009), 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 monitoring well data exceeds the GWPS for any Appendix IV constituent. As documented in the January 14, 2019 *Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)*, beryllium and lithium were present at statistically significant levels above the federal GWPS in one downgradient monitoring well within the Weadock Bottom Ash Pond groundwater monitoring system.

Confidence intervals were established per the statistical methods detailed in the *Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event* technical memorandum provided in Appendix B. For each Appendix IV constituent, the concentrations were first compared directly to the respective GWPSs. Constituent-well combinations that included a direct exceedance of the GWPSs were retained for further statistical analysis using confidence limits.

Overall, the assessment monitoring statistical evaluations have confirmed that beryllium, and lithium are the only Appendix IV constituents that have been present at statistically significant levels above the GWPS. The statistical evaluation of this semiannual assessment monitoring event data indicate that no appendix IV constituents are present at statistically significant levels exceeding the GWPS in downgradient monitoring wells at the Weadock Bottom Ash Pond:



Constituent GWPS #Downgradient Wells Observed

No constituents are present at statistically significant levels exceeding the GWPS

Previously, beryllium and lithium at JCW-MW-15009 were present at a statistically significant levels; however, the lower confidence limit for all Appendix IV constituents are below their respective GWPSs since May 2019. Source removal of CCR has been completed, as reported in the *Weadock Bottom Ash Pond Removal Documentation Report* (Golder, August 2020) and approved by the EGLE on December 18, 2020. Lithium and beryllium concentrations have been below the GWPS at JCW-MW-15009 for the past six semi-annual sampling events. Assessment monitoring will continue while Consumers Energy continues to evaluate corrective measures per §257.96 and §257.97. A summary of the confidence intervals for May 2022 is provided in Table 5.



#### 4.0 Conclusions and Recommendations

Corrective action has been triggered and assessment monitoring is ongoing at the Weadock Bottom Ash Pond CCR unit. A summary of the May 2022 assessment monitoring event is presented in this report. Overall, the statistical assessments have confirmed that beryllium and lithium are the only Appendix IV constituents present at statistically significant levels above the GWPS. Consumers Energy has completed the removal of CCR consistent with the timeline for closure of the Weadock Bottom Ash Pond under the *J.C. Weadock Generating Facility Bottom Ash Pond Closure Plan* (Golder, January 2018) and the CCR Rule's closure by removal provisions in §257.102(c).

Consumers Energy will continue assessment monitoring and evaluate corrective measures in accordance with §257.96 and §257.97 as outlined in the Weadock ACM. The groundwater management remedy for the Weadock Bottom Ash Pond will be selected as soon as feasible to meet the federal standards of §257.96(b). Consumers Energy will continue the assessment of corrective measures, per §257.95(g), and execute the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98. The next semiannual monitoring event is tentatively scheduled for the fourth calendar quarter of 2022.



#### 5.0 References

- ARCADIS. May 13, 2016. Summary of Monitoring Well Design, Installation, and Development. JC Weadock Electric Generation Facility – Essexville, Michigan. Prepared for Consumers Energy Company.
- Consumers Energy Company. January 2019. Notification of Appendix IV Constituent Exceeding Groundwater Protection Standards per §257.95(g).
- Golder Associates Inc. January 2018. J.C. Weadock Generating Facility Bottom Ash Pond Closure Plan, Essexville, Michigan. Prepared for Consumers Energy Company.
- Golder Associates Inc. August 2020. J.C. Weadock Generating Facility Bottom Ash Pond CCR Removal Documentation Report, Essexville, Michigan. Prepared for Consumers Energy Company.
- TRC. October 2017. Groundwater Statistical Evaluation Plan JC Weadock Power Plant, Bottom Ash Pond, Essexville, Michigan. Prepared for Consumers Energy Company.
- TRC Environmental Corporation. January 2018. Annual Groundwater Monitoring Report JC Weadock Power Plant, Bottom Ash Pond CCR Unit. Prepared for Consumers Energy Company.
- TRC Environmental Corporation. January 2019. 2018 Annual Groundwater Monitoring Report JC Weadock Power Plant, Bottom Ash Pond CCR Unit. Prepared for Consumers Energy Company.
- TRC. September 2019. Assessment of Corrective Measures JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Units. Prepared for Consumers Energy Company.
- USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.
- USEPA. April 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 80 Federal Register 74 (April 17, 2015), pp. 21301-21501 (80 FR 21301).
- USEPA. July 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435).
- USEPA. April 2018. Barnes Johnson (Office of Resource Conservation and Recovery) to James Roewer (c/o Edison Electric Institute) and Douglas Green, Margaret Fawal (Venable LLP). Re: Coal Combustion Residuals Rule Groundwater Monitoring Requirements. April 30, 2018. United States Environmental Protection Agency, Washington, D.C. 20460. Office of Solid Waste and Emergency Response, now the Office of Land and Emergency Management.



#### Summary of Groundwater Elevation Data: May 2022 Second Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

	тос		Screen Interval	Мау	May 2, 2022			
Well Location	Elevation (ft)	Geologic Unit of Screen Interval	Elevation (ft)	Depth to Water	Groundwater Elevation			
	1			(ft BTOC)	(ft)			
Background Monitorin	ig Wells		•					
MW-15002	587.71	Sand	580.9 to 570.9	6.61	581.10			
MW-15008	585.36	Sand with clay	578.7 to 568.7	4.38	580.98			
MW-15016	586.49	Sand	581.2 to 578.2	3.66	582.83			
MW-15019	586.17	Sand and Sand/Clay	579.5 to 569.5	5.31	580.86			
Bottom Ash Pond: Do	wngradient Monito	oring Wells	•		•			
JCW-MW-15007	587.40	Sand	582.7 to 579.2	3.43	583.97			
JCW-MW-15009	589.64	Sand	581.9 to 576.9	8.70	580.94			
JCW-MW-15010	597.76	Sand	579.7 to 578.2	17.25	580.51			
JCW-MW-15028	589.64	Sand	567.7 to 564.7	7.28	582.36			
Landfill: Downgradien	t Monitoring Wells	(outside slurry wall)			-			
JCW-MW-18001	596.73	Sand and Sandy Clay	578.3 to 573.3	16.78	579.95			
JCW-MW-18004	593.04	Sandy Clay	583.9 to 578.9	12.28	580.76			
JCW-MW-18005	590.89	Sand and Sandy Clay	580.0 to 575.0	8.33	582.56			
JCW-MW-18006	600.72	Fly Ash and Sandy Clay	582.8 to 577.8	12.91	587.81			
MW-50	593.36	Sand	577.8 to 574.8	13.49	579.87			
MW-51	594.29	Sand and Clay	577.8 to 574.8	14.33	579.96			
MW-52	594.90	Sand	579.3 to 576.3	14.13	580.77			
MW-53	593.68	Sand and Clay	579.1 to 576.1	13.72	579.96			
MW-53R	594.25	Sand and Clay	580.4 to 575.4	14.23	580.02			
MW-54R	593.89	Clav and Sand	581.3 to 576.3	13.80	580.09			
MW-55	593.82	Sand	581.5 to 578.5	14.00	579.82			
OW-57ROUT	591.00	Sandy Clay	577.0 to 572.0	10.18	580.82			
Landfill: Static Water I			0.1.0					
JCW-OW-18001	595.84	Fly Ash and Sand	581.1 to 576.1	17.08	578.76			
JCW-OW-18002	593.63	Sand	578.9 to 573.9	10.94	582.69			
JCW-OW-18003	593.99	Sand and Clay	580.5 to 575.5	8.55	585.44			
JCW-OW-18004	594.19	Sandy Clay	584.6 to 579.6	6.27	587.92			
JCW-OW-18006	600.61	Fly Ash and Clay with Sand	582.9 to 577.9	9.20	591.41			
MW-20	592.73	NR	~581.1 to ~578.1	6.53	586.20			
OW-51	593.62	Clay and Sand	578.9 to 575.9	10.08	583.54			
OW-53	593.64	Clay and Sand	579.0 to 576.0	7.58	586.06			
OW-54	594.10	Clay and Sand	580.0 to 577.0	6.81	587.29			
OW-55	594.67	Clay (or Sand and Clay)	580.9 to 577.9	6.18	588.49			
OW-56R	592.01	Ash and Sand	577.5 to 572.5	5.95	586.06			
OW-57R IN	590.86	Sandy Clay	575.7 to 570.7	6.08	584.78			
OW-61	602.15	Ash and Sand	588.0 to 585.0	9.66	592.49			
OW-63	612.53	Ash and Sand	594.2 to 591.2	NM	NM			
Landfill: Leachate Hea		7.6 6.14 64.14						
LH-103R	612.70	Fly Ash	30.2 to 33.2	23.58	589.12			
LH-104	596.56	Fly Ash	8.0 to 11.0	7.48	589.08			
LITTOT	000.00	ı iy Aəli	0.0 10 11.0	7.40				

#### 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 NM: Not Measured

#### Summary of Field Parameters: May 2022 JC Weadock Bottom Ash Pond - RCRA CCR Monitoring Program Essexville, Michigan

Sample Location	ion Sample Date Dissolv		Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature	Turbidity (NTU)
Background							
MW-15002	5/2/2022	0.00	-49.7	6.5	5,911	9.2	10.0
MW-15008	5/2/2022	0.05	-73.2	6.4	1,347	8.5	9.5
MW-15016	5/3/2022	0.01	-84.0	6.7	1,390	8.1	10.0
MW-15019	5/2/2022	0.01	-71.1	6.5	1,414	7.3	4.0
Weadock Bottom Ash Pond							
JCW-MW-15007	5/10/2022		-100.5	7.2	16,955	12.0	7.8
JCW-MW-15009	5/10/2022		-40.8	5.9	2,480	12.0	10.0
JCW-MW-15010	5/10/2022		-56.0	7.1	1,240	16.0	9.0
JCW-MW-15028	5/10/2022		-53.8	7.7	4,295	12.7	2.9

#### Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard Units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celsius.

NTU - Nephelometric Turbidity Unit.

-- = Parameter Not Measured. The dissolved oxygen sensor on the water quality meter was not functioning.

Summary of Groundwater Sampling Results (Analytical): May 2022
DE Karn & JC Weadock Background – RCRA CCR Monitoring Program
Essexville, Michigan

					Sample Location:	MW-15002	MW-15008	MW-15016	MW-15019
					Sample Date:	5/2/2022	5/2/2022	5/3/2022	5/2/2022
				MI Non-			Doole		•
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^		Васко	ground	
Appendix III <sup>(1)</sup>									
Boron	ug/L	NC	500	500	4,000	103	112	329	236
Calcium	mg/L	NC	NC	NC	500EE	238	89.5	216	139
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	50	2,210	197	243	324
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500EE	6	4.99	267	62.5
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	4,240	783	1,390	1,200
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	6.5	6.4	6.7	6.5
Appendix IV <sup>(1)</sup>									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	<1	< 1	< 1
Arsenic	ug/L	10	10	10	10	14	2	8	2
Barium	ug/L	2,000	2,000	2,000	1,200	682	52	72	308
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	3	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	16	16	80	12
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	1.37	< 0.447	< 0.368	< 0.579
Radium-228	pCi/L	NC	NC	NC	NC	3.30	< 0.588	< 0.611	1.83
Radium-226/228	pCi/L	5	NC	NC	NC	4.68	0.826	0.624	2.11
Selenium	ug/L	50	50	50	5	54	< 1	2	2
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 115 <sup>(2)</sup>									
Iron	ug/L	300**	300 <sup>E</sup>	300E	500,000EE	16,100	15,500	8,020	21,000
Copper	ug/L	1,000**	1,000E	1,000E	20	3	< 1	5	< 1
Nickel	ug/L	NC	100	100	120	14	5	13	8
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	15	6	3	3
Zinc	ug/L	5,000**	2,400	5,000E	260	23	< 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.

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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 EGLE 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 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.

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.

Summary of Groundwater Sampling Results (Analytical): May 2022 JC Weadock Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	JCW-MW-15007	JCW-MW-15009	JCW-MW-15010	JCW-MW-15028
					Sample Date:	5/10/2022	5/10/2022	5/10/2022	5/10/2022
	1	I	1	MI Non-		3/10/2022	3/10/2022	3/10/2022	3/10/2022
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^				
Appendix III <sup>(1)</sup>									
Boron	ug/L	NC	500	500	4,000	255	202	1,200	633
Calcium	mg/L	NC	NC	NC	500EE	275	526	165	199
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	50	3,470	34.5	41.7	1,070
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500EE	28.4	1,310	167	93.7
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	7,000	2,270	838	2,500
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	7.2	5.9	7.1	7.7
Appendix IV <sup>(1)</sup>									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	<1	< 1	< 1
Arsenic	ug/L	10	10	10	10	24	<1	5	< 1
Barium	ug/L	2,000	2,000	2,000	1,200	1,540	17	219	351
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	3	1	< 1	2
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	81	80	74	54
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	1.09	< 0.601	< 0.488	0.490
Radium-228	pCi/L	NC	NC	NC	NC	1.21	1.11	0.932	0.944
Radium-226/228	pCi/L	5	NC	NC	NC	2.30	1.45	0.952	1.43
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 <sup>0</sup>	2)								
Iron	ug/L	300**	300 <sup>E</sup>	300 <sup>E</sup>	500,000EE	9,530	15,700	400	399
Copper	ug/L	1,000**	1,000E	1,000E	20	3	3	< 1	1
Nickel	ug/L	NC	100	100	120	18	29	8	11
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	28	3	< 2	11
Zinc	ug/L	5,000**	2,400	5,000E	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.

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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}.
- $^{\mbox{\scriptsize EE}}$  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 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.

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

 $\ensuremath{\mathsf{RED}}$  value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 5

#### Summary of Groundwater Protection Standard Exceedances – May 2022 JC Weadock Bottom Ash Pond – RCRA CCR Monitoring Program

#### Essexville, Michigan

Constituent	Units	GWPS	JCW-MW-15007		JCW-MW-15009		JCW-MW-15010	
			LCL	UCL	LCL	UCL	LCL	UCL
Arsenic	ug/L	21	15	49			3.0	17
Barium	ug/L	2,000	900	1,900				
Beryllium	ug/L	4			1.0	6.6		
Lithium	ug/L	180			33	176		

#### Notes:

ug/L - micrograms per Liter

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated October 15, 2018.

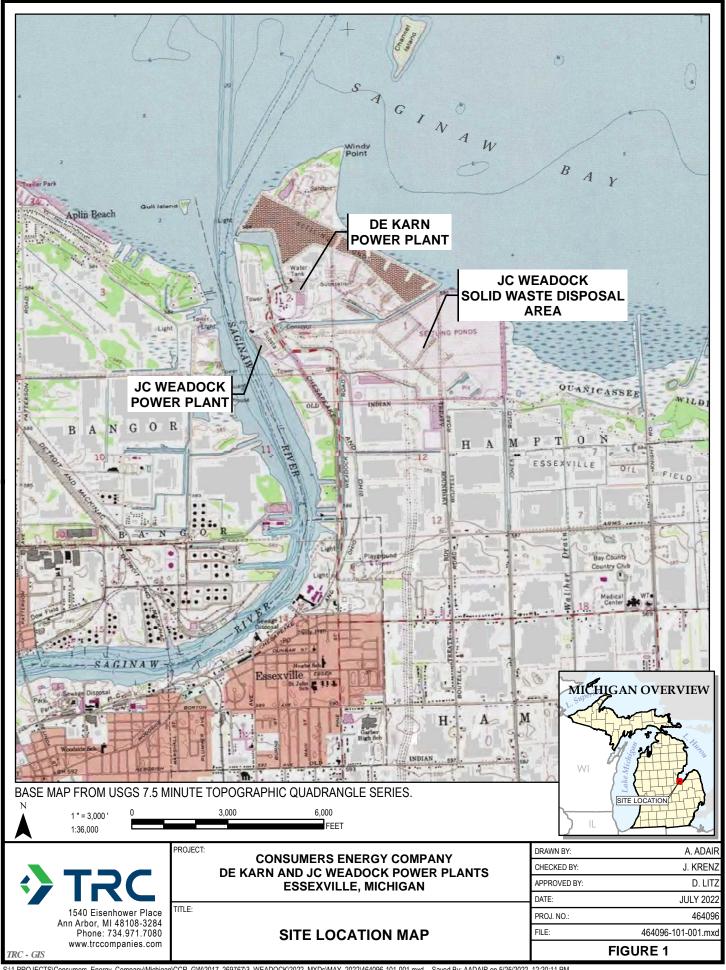
UCL - Upper Confidence Limit ( $\alpha$  = 0.01) of the downgradient data set.

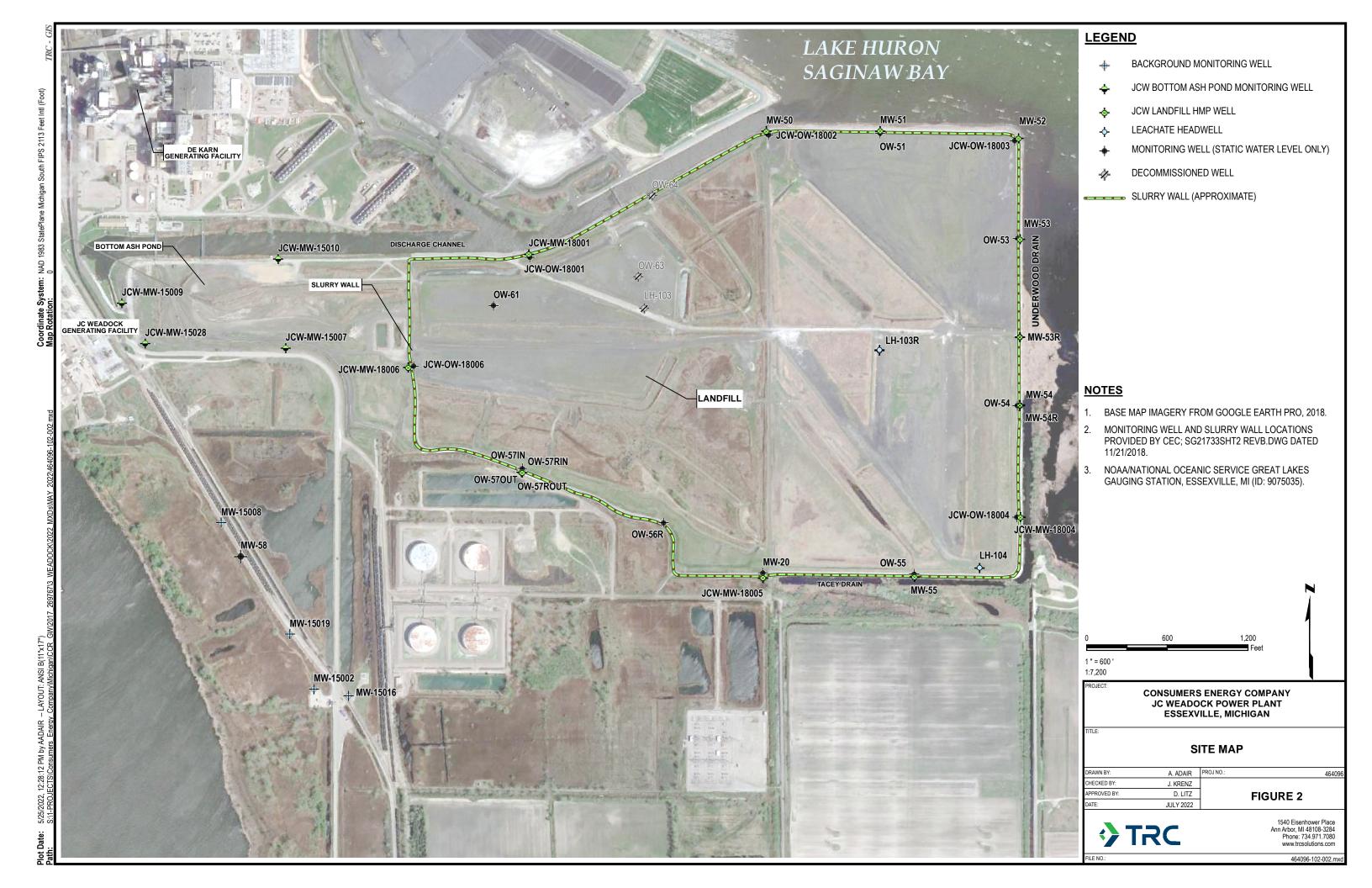
LCL - Lower Confidence Limit ( $\alpha = 0.01$ ) of the downgradient data set.

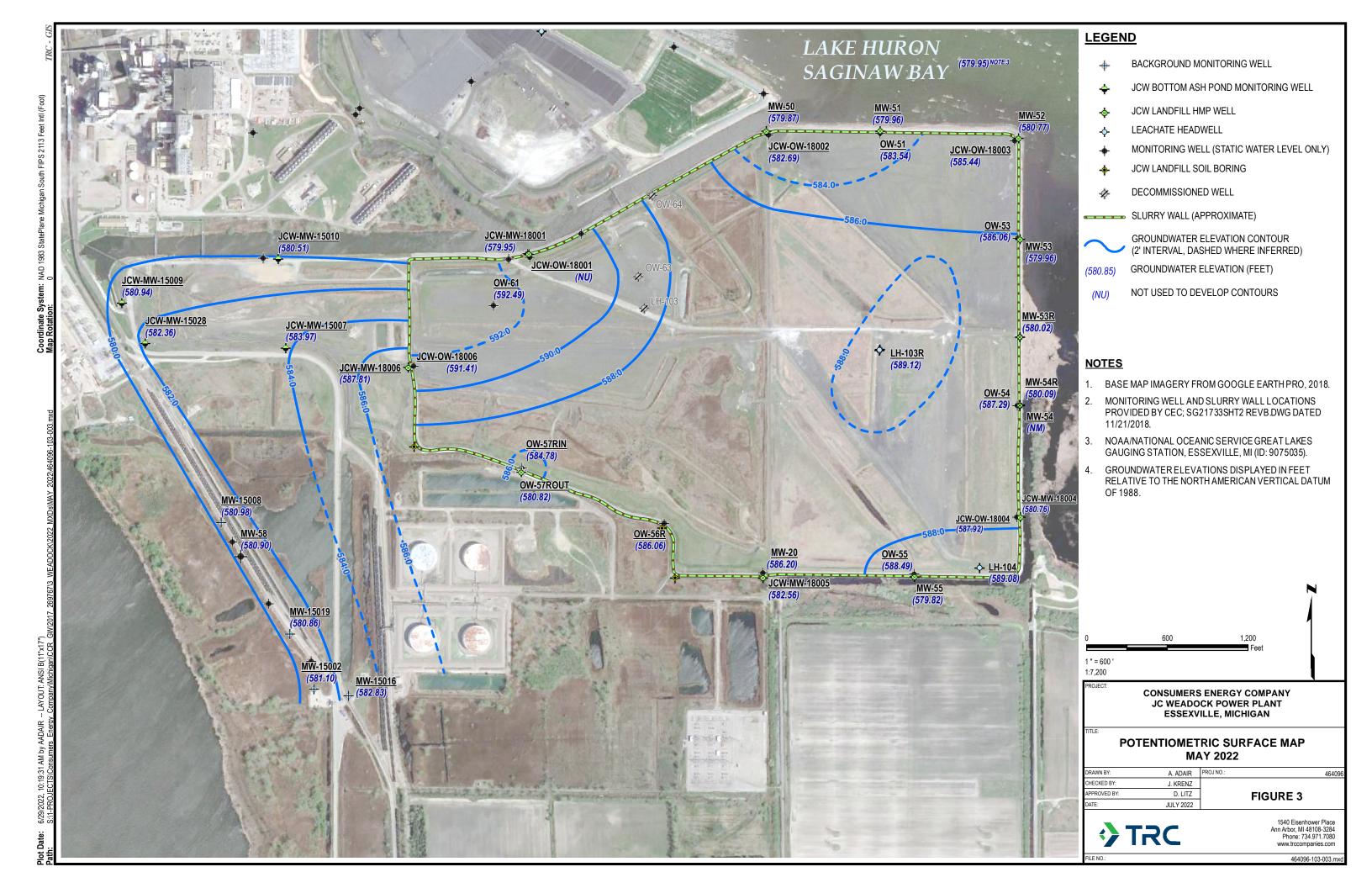
Indicates a statistically significant exceedance of the GWPS. An exceedance occurs when the LCL is greater than the GWPS.



# **Figures**









# **Appendix A Data Quality Reviews**

# Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock Bottom Ash Pond

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for total metals, anions, alkalinity, 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) 22-0440.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

JCW-MW-15007

■ JCW-MW-15009

■ JCW-MW-15010

JCW-MW-15028

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	
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 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, 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 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 equipment blank (EB-JCW-BAP) and one field blank (FB-JCW-BAP) were collected.
   Total metals were not detected in these blank samples.
- MS and MSD analyses were performed on sample JCW-MW-15009 for total metals, anions, and alkalinity. The MS and MSD recoveries were within the acceptance criteria. Relative percent differences (RPDs) were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- The field duplicate pair samples were DUP-JCW-BAP and JCW-MW-15010; all criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

# Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock Bottom Ash Pond

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166414-1.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

JCW-MW-15007

■ JCW-MW-15009

■ JCW-MW-15010

■ JCW-MW-15028

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 (EB-02) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative percent differences (RPDs) or relative error ratios (RER) for all target analytes were within laboratory control limits.
- MS/MSD duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-02/JCW-MW-15010. All criteria were met.
- Carrier recoveries were within 40-110%.

# Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock/DE Karn Background

Groundwater samples were collected by TRC for the May 2022 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) 22-0443.

During the May 2022 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. Total metals were not detected in this blank sample.
- MS and MSD analyses were not performed on a sample from this data set.
- The field duplicate pair samples were DUP-Background and MW-15008; all criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

# Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock/Karn DEK Background

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166150-1.

During the May 2022 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 (EB-04) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
  - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with all samples. Positive detections of radium 228 in select samples should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-04/MW-15008. All criteria were met.
- Carrier recoveries were within 40-110%.

#### Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data JC Weadock and DE Karn Background Wells – CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue				
MW-15002	5/2/2022						
MW-15019	5/2/2022	Radium 228	Detected results should be considered estimated due to LCS/LCSD Relative Error Ratio (RER) outside of criteria.				
DUP-04	5/2/2022						



# Appendix B Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event



**Date:** June 29, 2022

**To:** J.R. Register, Consumers Energy

From: Darby Litz, TRC

Alex Eklund, TRC

**Project No.:** 464096.0001 Phase 002, Task 002

Subject: Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event

JC Weadock Bottom Ash Pond, Consumers Energy Company, Essexville, Michigan

During the statistical evaluation of the initial assessment monitoring event (May 2018), beryllium and lithium were 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 Rule¹ at the JC Weadock Power Plant Bottom Ash Pond. The first semiannual assessment monitoring event for 2022 was conducted on May 2 through 10, 2022. In accordance with §257.95, the assessment monitoring data must be compared to GWPSs to determine whether or not Appendix IV constituents are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h), as detailed in the October 15, 2018 Groundwater Protection Standards technical memorandum, which was also included in the 2018 Annual Groundwater Monitoring Report (TRC, January 2019). The following narrative describes the methods employed and the results obtained and the Sanitas™ output files are included as an attachment.

The statistical evaluation of the first semiannual 2022 assessment monitoring event data indicates that no constituents are present at statistically significant levels that exceed the GWPSs in downgradient monitoring wells at the Weadock Bottom Ash Pond.

### Constituent GWPS #Downgradient Wells Observed

No constituents are present at statistically significant levels above the GWPSs.

Both beryllium and lithium at downgradient well JCW-MW-15009 were previously present at statistically significant levels; however, the May 2022 statistical evaluation shows that the lower confidence limits for lithium and beryllium are currently below the GWPSs. Beryllium and lithium have not been present at statistically significant levels since the first semiannual event of 2019. Although no Appendix

<sup>&</sup>lt;sup>1</sup> 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).

IV constituents are present at statistically significant levels above the GWPS based on this data evaluation, corrective action has been triggered as a result of data collected during the previous assessment monitoring events. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Once a final remedy is selected, an attainment monitoring program will be developed and used to demonstrate compliance with the GWPSs established under §257.95(h) by showing that concentrations of constituents listed in Appendix IV to this part are below the GWPSs (i.e. upper confidence limit below GWPSs) for a period of three consecutive years using the statistical procedures and performance standards in §257.93(f) and (g). Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

### **Assessment Monitoring Statistical Evaluation**

The four downgradient wells (JCW-MW-15007, JCW-MW-15009, JCW-MW-15010, and JCW-MW-15028) are located in accessible areas along the downgradient perimeter of the Weadock Bottom Ash Pond. Following the assessment monitoring sampling event, compliance well data for the Weadock Bottom Ash Pond were evaluated in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, October 2017).

An assessment monitoring program was developed to evaluate concentrations of CCR constituents present in the uppermost aquifer relative to acceptable levels (i.e. GWPSs). To evaluate whether or not a GWPS exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given assessment monitoring event compared to the GWPS 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<sup>2</sup>, 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 mean 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 GWPS. If the confidence interval straddles the GWPS (i.e., the lower confidence level is below the GWPS, 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 GWPS 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 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 Appendix IV constituent, the concentrations from each well were first compared directly to the GWPS, as shown on Table 1. Parameter-well combinations that included a direct

<sup>&</sup>lt;sup>2</sup> USEPA. 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Conservation and Recovery. EPA 530/R-09-007.

exceedance of the GWPS within the past eight sampling events (November 2018 through May 2022) were retained for further analysis. Arsenic at JCW-MW-15007 and JCW-MW-15010, barium at JCW-MW-15007, and beryllium and lithium at JCW-MW-15009 had individual results exceeding their respective GWPSs within this time period.

Groundwater data were evaluated utilizing Sanitas<sup>TM</sup> statistical software. Sanitas<sup>TM</sup> is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas<sup>TM</sup> statistical program, confidence limits were selected to perform the statistical comparison of compliance data to a fixed standard. Parametric and non-parametric confidence intervals, as appropriate, were calculated for each of the CCR Appendix IV constituents using a per test<sup>3</sup> 99 percent confidence level, i.e., a significance level ( $\alpha$ ) of 0.01. The following narrative describes the methods employed and the results obtained. The Sanitas<sup>TM</sup> 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 CCR assessment monitoring program. Initially, the assessment monitoring results (November 2018 through May 2022) were observed visually for potential trends. No outliers or visual trends were identified. The decreases in constituent concentrations at JCW-MW-15009 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. Beryllium and lithium concentrations have already triggered assessment monitoring (e.g., not newly identified GWPS exceedances) and an interim measure has been initiated through cessation of hydraulic loading to the bottom ash pond in April 2018; therefore, traditional confidence interval calculations are presented in this statistical evaluation until more data are available. Once additional data are collected in the absence of hydraulic loading, confidence bands may be a more appropriate assessment to determine compliance with the CCR Rule. 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. At least 8

<sup>&</sup>lt;sup>3</sup> Confidence level is assessed for each individual comparison (i.e. per well and per constituent)

to 10 measurements should be available when computing a confidence band around a linear regression.

The Sanitas<sup>TM</sup> software was then used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent 8 sampling events. Eight independent sampling events provide the appropriate density of data as recommended per the Unified Guidance yet are collected recently enough to provide an indication of current condition. The tests were run with a pertest significance of  $\alpha = 0.01$ . The software outputs 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. Non-detect data was handled in accordance with the Stats Plan for the purposes of calculating the confidence intervals.

The Sanitas<sup>™</sup> 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. The data sets for arsenic at JCW-MW-15007 and JCW-MW-15010, barium at JCW-MW-15007, and lithium at JCW-MW-15009 were found to be normally distributed. A non-parametric confidence interval was used for beryllium at JCW-MW-15009 due to a high percentage of non-detects in the dataset. The confidence interval test compares the lower confidence limit to the GWPS. The statistical evaluation of the Appendix IV parameters shows no constituents present at statistically significant levels that exceed the GWPSs. The results of the assessment monitoring statistical evaluation are consistent with the previous (October 2021) assessment monitoring data statistical evaluation. Although no Appendix IV constituents are present at statistically significant levels above the GWPS based on this data evaluation, corrective action has been triggered as a result of data collected during the previous assessment monitoring events. Compliance with the GWPSs established under § 257.95(h) will be achieved by demonstrating that concentrations of constituents listed in Appendix IV to this part have not exceeded the GWPSs (i.e. upper confidence limit is below GWPS) for a period of three consecutive years using the statistical procedures and performance standards in § 257.93(f) and (g). Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

#### **Attachments**

Table 1 Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022

Attachment 1 Sanitas™ Output Files

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022

JC Weadock Bottom Ash Pond – RCRA CCR Monitoring Program

Essexville, Michigan

				JCW-MW-15007												
				Sa	ample Location:	44/7/0040	4/0/0040	40/45/0040	10/15/0010				5/40/2004	40/40/0004	10/10/0001	5/40/0000
		1	1		Sample Date:	11/7/2018	4/9/2019	10/15/2019	10/15/2019	5/14/2020	10/13/2020	5/12/2021	5/12/2021	10/12/2021	10/12/2021	5/10/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS											
Appendix III									Field Dup				Field Dup		Field Dup	
Boron	ug/L	NC	NA	619	NA	656	290	470	460	335	329	233	240	503	532	255
Calcium	mg/L	NC	NA	302	NA	153	200	130	120	217	413	280	294	265	267	275
Chloride	mg/L	250*	NA	2,440	NA	788	1,600	1,200	1,200	2,870	5,810	3,780	3,830	2,820	2,790	3,470
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 10,000 (1)	< 5,000 <sup>(1)</sup>	< 5,000 <sup>(1)</sup>	< 1,000	1,160	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	23.9	< 20	44	43	57.2	4.47	29.0	29.8	82.1	82.5	28.4
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	1,790	3,400	2,300	2,400	5,080	11,200	7,200	7,280	5,070	4,920	7,000
pH, Field	SU	6.5 - 8.5*	NA	6.5-7.3	NA	7.1	7.2	7.1		7.6	7.3	7.1		7.0		7.2
Appendix IV																
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	46.3	9.8	34	35	19	61	31	31	17	45	24
Barium	ug/L	2,000	NA	1,300	2,000	1,060	950	970	970	1,180	2,400	1,680	1,670	1,620	1,590	1,540
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 1.0	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 5.0	< 1.0	< 1.0	< 1.0	< 1	1	< 1	< 1	1	1	3
Cobalt	ug/L	NC	6	15	15	< 30.0 (1)	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 10,000 (1)	< 5,000 <sup>(1)</sup>	< 5,000 <sup>(1)</sup>	< 1,000	1,160	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 5.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	87	67	70	67	103	94	70	69	144	151	81
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	< 25.0	6.2	9.7	9.6	< 5	< 5	8	8	7	7	5
Radium-226	pCi/L	NC	NA	NA	NA	1.33	0.628	0.659	0.442	0.728	1.71	1.32	1.01	1.35	1.02	1.09
Radium-228	pCi/L	NC	NA	NA	NA	0.975	0.492	0.796	0.543	0.698	1.67	1.27	1.43	1.63	1.66	1.21
Radium-226/228	pCi/L	5	NA	3.32	5	2.31	1.12	1.45	0.986	1.43	3.38	2.59	2.45	2.98	2.68	2.30
Selenium	ug/L	50	NA	2	50	< 1.0	3.2	< 1.0	< 1.0	< 1	< 1	4	3	< 1	< 1	< 1
Thallium	ug/L	2	NA	2	2	< 10.0 <sup>(1)</sup>	< 2.0	< 2.0	< 2.0	< 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.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in TRC's Technical Memorandum dated October 15, 2018.

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

**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.

All metals were analyzed as total unless otherwise specified.

(1) Laboratory reporting limit exceeds GWPS due to sample dilutions performed as a result of sample matrix interferences. and/or concentrations of other constituents present.

 TRC | Consumers Energy

 X:\WPAAMPJT2\W64096\0001\17SA22 BAP\T418426.1-Appx B2

 Page 1 of 4

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022

JC Weadock Bottom Ash Pond – RCRA CCR Monitoring Program

Essexville, Michigan

				S	ample Location:	JCW-MW-15009							
					Sample Date:	11/7/2018	4/9/2019	10/15/2019	5/14/2020	10/13/2020	5/12/2021	10/13/2021	5/10/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS								
Appendix III													
Boron	ug/L	NC	NA	619	NA	422	290	330	141	263	255	289	202
Calcium	mg/L	NC	NA	302	NA	589	510	520	314	560	574	615	526
Chloride	mg/L	250*	NA	2,440	NA	64.9	43	18	3.19	5.96	14.8	28.7	34.5
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 2,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	1,980	1,600	1,400	611	1,060	1,450	1,410	1,310
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	2,620	2,400	2,100	1,370	1,910	2,230	2,400	2,270
pH, Field	SU	6.5 - 8.5*	NA	6.5-7.3	NA	4.8	5.4	6.1	7.2	6.6	5.6	6.0	5.9
Appendix IV													
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	< 5.0	< 1.0	< 1.0	< 1	1	< 1	3	< 1
Barium	ug/L	2,000	NA	1,300	2,000	14.8	14	66	58	51	23	23	17
Beryllium	ug/L	4	NA	1	4	6.6	4.3	< 1.0	< 1	< 1	< 1	< 1	1
Cadmium	ug/L	5	NA	0.2	5	< 1.0	0.24	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 5.0	1.4	< 1.0	2	< 1	< 1	< 1	1
Cobalt	ug/L	NC	6	15	15	< 30.0 <sup>(1)</sup>	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 2,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 5.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	240	150	94	18	53	89	112	80
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	< 25.0	< 5.0	9.3	10	9	< 5	< 5	< 5
Radium-226	pCi/L	NC	NA	NA	NA	< 0.803	< 0.0879	0.175	< 0.125	< 0.352	0.333	0.388	< 0.601
Radium-228	pCi/L	NC	NA	NA	NA	1.25	< 0.411	0.548	< 0.491	< 0.495	0.720	0.922	1.11
Radium-226/228	pCi/L	5	NA	3.32	5	< 1.54	< 0.411	0.723	< 0.491	< 0.495	1.05	1.31	1.45
Selenium	ug/L	50	NA	2	50	< 5.0	2.0	2.0	1	< 1	< 1	< 1	< 1
Thallium	ug/L	2	NA	2	2	< 10.0 <sup>(1)</sup>	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2

#### Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in TRC's

Technical Memorandum dated October 15, 2018.

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

**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.

All metals were analyzed as total unless otherwise specified.

(1) Laboratory reporting limit exceeds GWPS due to sample dilutions performed as a result of sample matrix interferences. and/or concentrations of other constituents present.

 TRC | Consumers Energy

 X:\WPAAMPJT2\W64096\0001\17SA22 BAP\T418426.1-Appx B2

 Page 2 of 4

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022

JC Weadock Bottom Ash Pond – RCRA CCR Monitoring Program

Essexville, Michigan

Sample Location							JCW-MW-15010									
				O	Sample Date:	11/7/2018	4/9/2019	10/14/2019	5/14/2020	10/13/2020	10/13/2020	5/11/2021	10/13/2021	5/10/2022	5/10/2022	
									0,11,12000			•, • , • •			0, 10, 202	
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS											
Appendix III											Field Dup				Field Dup	
Boron	ug/L	NC	NA	619	NA	1,360	1,400	1,400	2,070	2,000	2,030	1,080	1,190	1,200	1,200	
Calcium	mg/L	NC	NA	302	NA	84.4	120	110	286	218	204	128	142	165	165	
Chloride	mg/L	250*	NA	2,440	NA	96.5	140	140	90.4	105	106	67.8	50.7	41.7	41.9	
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	
Sulfate	mg/L	250*	NA	407	NA	22.3	36	30	553	254	255	74.7	77.0	167	167	
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	492	670	600	1,500	982	997	607	667	838	806	
pH, Field	SU	6.5 - 8.5*	NA	6.5-7.3	NA	7.4	7.6	7.3	7.7	7.1		7.2	7.1	7.1		
Appendix IV																
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Arsenic	ug/L	10	NA	21	21	9.5	16	13	4	4	4	6	22	5	5	
Barium	ug/L	2,000	NA	1,300	2,000	114	190	180	400	220	221	148	221	219	220	
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium	ug/L	100	NA	3	100	1.2	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	1	
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6	
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Lithium	ug/L	NC	40	180	180	70	73	84	116	96	97	70	92	74	73	
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Molybdenum	ug/L	NC	100	6	100	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Radium-226	pCi/L	NC	NA	NA	NA	< 0.879	0.215	< 0.134	0.409	< 0.442	< 0.445	< 0.410	0.389	< 0.488	< 0.415	
Radium-228	pCi/L	NC	NA	NA	NA	< 0.776	0.424	0.412	< 0.467	< 0.493	< 0.566	0.700	0.858	0.932	1.37	
Radium-226/228	pCi/L	5	NA	3.32	5	< 1.66	0.639	0.536	0.781	< 0.493	< 0.566	0.898	1.25	0.952	1.50	
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 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.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

 ${\it GWPS-Groundwater\ Protection\ Standard.\ GWPS\ is\ the\ higher\ of\ the\ MCL/RSL\ and\ UTL\ as\ established\ in\ TRC's}$ 

Technical Memorandum dated October 15, 2018.

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

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.

All metals were analyzed as total unless otherwise specified.

(1) Laboratory reporting limit exceeds GWPS due to sample dilutions performed as a result of sample matrix interferences. and/or concentrations of other constituents present.

 TRC | Consumers Energy

 X:\WPAAMPJT2\W64096\0001\17SA22 BAP\T418426.1-Appx B2

 Page 3 of 4

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022

JC Weadock Bottom Ash Pond – RCRA CCR Monitoring Program

Essexville, Michigan

						JCW-MW-15028										
				S	ample Location:	44/7/0040	44/7/0040	4/0/0040	4/0/0040				40/40/0000	E/40/0004	40/40/0004	F/40/0000
			1		Sample Date:	11/7/2018	11/7/2018	4/9/2019	4/9/2019	10/14/2019	5/14/2020	5/14/2020	10/13/2020	5/12/2021	10/12/2021	5/10/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS											
Appendix III							Field Dup		Field Dup			Field Dup				
Boron	ug/L	NC	NA	619	NA	517	525	530	560	550	570	562	644	563	620	633
Calcium	mg/L	NC	NA	302	NA	153	153	170	180	170	205	204	221	235	205	199
Chloride	mg/L	250*	NA	2,440	NA	352	347	660	650	640	823	806	811	921	974	1,070
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 2,000	< 2,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	111	110	120	120	120	128	122	99.8	102	97	93.7
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	976	966	1,800	1,800	1,500	2,210	2,240	2,070	2,130	2,360	2,500
pH, Field	SU	6.5 - 8.5*	NA	6.5-7.3	NA	7.9		8.0		7.8	8.1		7.9	7.7	7.8	7.7
Appendix IV																
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	< 1.0	1.1	1.1	1.1	< 1.0	< 1	1	< 1	3	11	< 1
Barium	ug/L	2,000	NA	1,300	2,000	156	158	250	240	230	324	331	332	342	363	351
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	2
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 1,000	< 2,000	< 2,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	2	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	51	49	53	51	48	60	60	53	51	66	54
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NA	NA	NA	1.13	0.786	0.621	0.384	0.576	0.515	< 0.136	0.697	0.621	0.819	0.49
Radium-228	pCi/L	NC	NA	NA	NA	< 0.685	<0.591	0.729	0.658	0.585	0.733	< 0.399	< 0.468	0.997	1.19	0.944
Radium-226/228	pCi/L	5	NA	3.32	5	1.60	1.26	1.35	1.04	1.16	1.25	< 0.399	1.15	1.62	2.00	1.43
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 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.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in TRC's Technical Memorandum dated October 15, 2018.

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

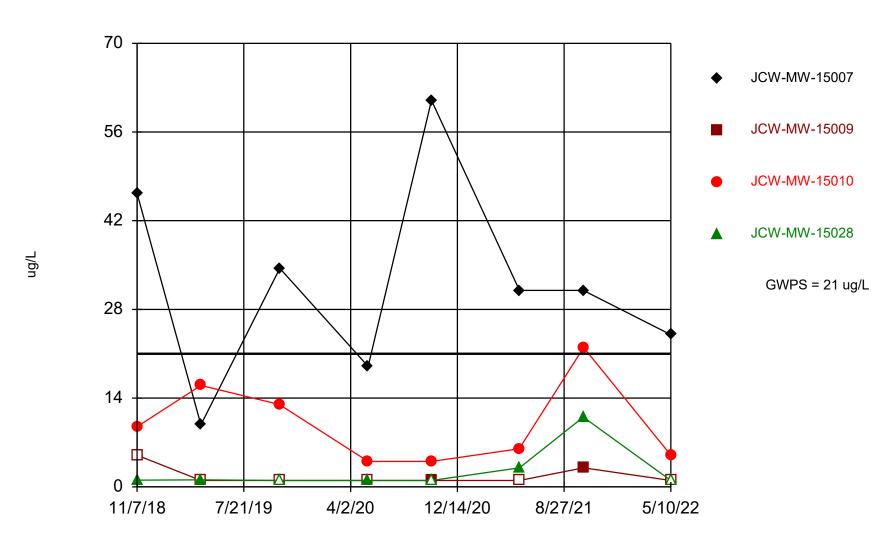
**Bold** value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

(1) Laboratory reporting limit exceeds GWPS due to sample dilutions performed as a result of sample matrix interferences. and/or concentrations of other constituents present.

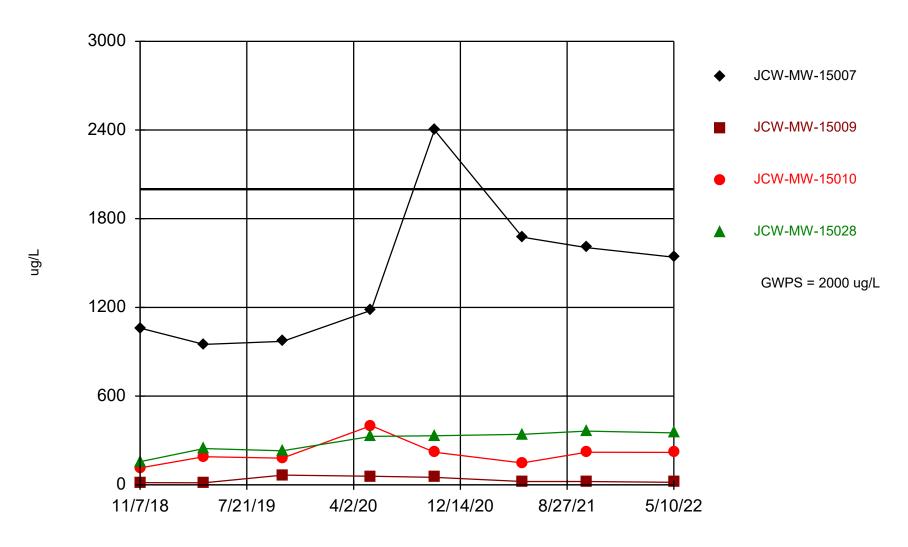
### Attachment 1 Sanitas™ Output Files

### Arsenic Comparison to GWPS



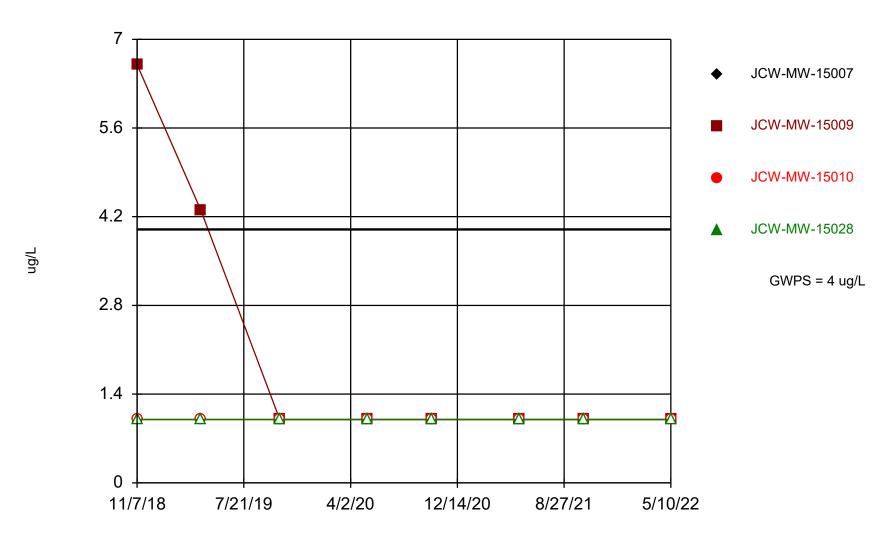
Time Series Analysis Run 6/10/2022 10:50 AM

### Barium Comparison to GWPS



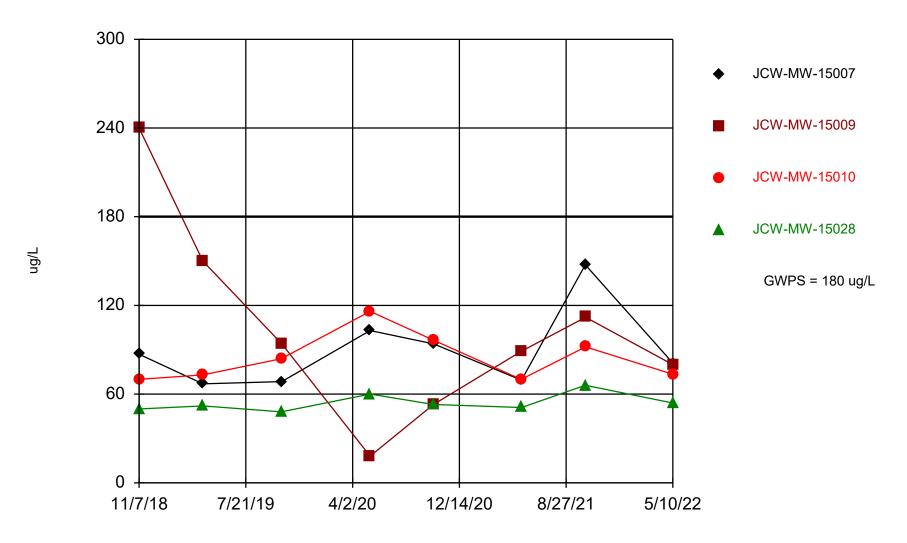
Time Series Analysis Run 6/10/2022 10:51 AM

### Beryllium Comparison to GWPS



Time Series Analysis Run 6/10/2022 10:52 AM

### Lithium Comparison to GWPS



Time Series Analysis Run 6/10/2022 10:53 AM

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UC

### **Summary Report**

Constituent: Arsenic, Total Analysis Run 6/10/2022 10:54 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 11/7/2018 and 5/10/2022, a summary of the selected data set:

Observations = 32 ND/Trace = 9 Wells = 4 Minimum Value = 1 Maximum Value = 61 Mean Value = 11.57 Median Value = 4.5 Standard Deviation = 15.02 Coefficient of Variation = 1.298

Skewness = 1.701

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-15007	8	0	9.8	61	32.08	31	15.94	0.4971	0.5002
JCW-MW-15009	8	6	1	5	1.75	1	1.488	0.8503	1.564
JCW-MW-15010	8	0	4	22	9.938	7.75	6.571	0.6612	0.7572
JCW-MW-15028	8	3	1	11	2.519	1.025	3.496	1.388	2.109

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG

### **Summary Report**

Constituent: Barium, Total Analysis Run 6/10/2022 10:54 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 11/7/2018 and 5/10/2022, a summary of the selected data set:

Observations = 32 ND/Trace = 0 Wells = 4 Minimum Value = 14 Maximum Value = 2400 Mean Value = 490.2 Median Value = 225.5 Standard Deviation = 604.6 Coefficient of Variation = 1.233 Skewness = 1.606

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-15007	8	0	950	2400	1423	1360	490.6	0.3449	0.9026
JCW-MW-15009	8	0	14	66	33.35	23	21.33	0.6396	0.5517
JCW-MW-15010	8	0	114	400	211.6	204.8	85.16	0.4024	1.35
JCW-MW-15028	8	0	157	363	293.4	329.8	73.82	0.2516	-0.8239

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG

### **Summary Report**

Constituent: Beryllium, Total Analysis Run 6/10/2022 10:54 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 11/7/2018 and 5/10/2022, a summary of the selected data set:

Observations = 32 ND/Trace = 29 Wells = 4 Minimum Value = 1 Maximum Value = 6.6 Mean Value = 1.278 Median Value = 1 Standard Deviation = 1.133 Coefficient of Variation = 0.8862

Skewness = 4.007

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	Skewness
JCW-MW-15007	8	8	1	1	1	1	0	0	NaN
JCW-MW-15009	8	5	1	6.6	2.113	1	2.15	1.018	1.423
JCW-MW-15010	8	8	1	1	1	1	0	0	NaN
JCW-MW-15028	8	8	1	1	1	1	0	0	NaN

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UC

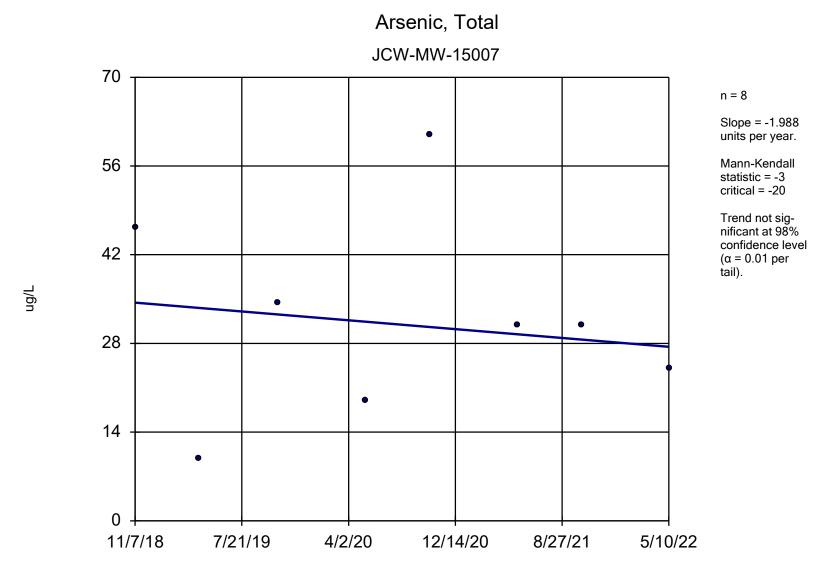
### **Summary Report**

Constituent: Lithium, Total Analysis Run 6/10/2022 10:54 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

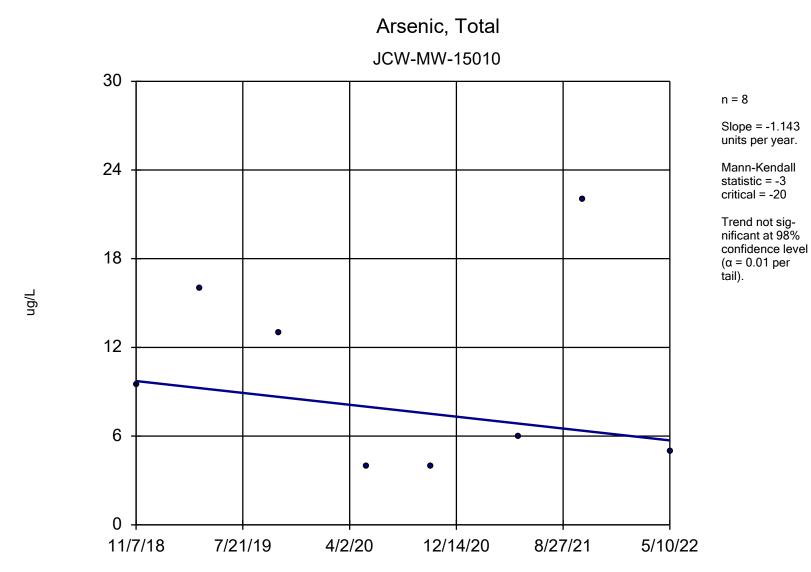
For observations made between 11/7/2018 and 5/10/2022, a summary of the selected data set:

Observations = 32 ND/Trace = 0 Wells = 4 Minimum Value = 18 Maximum Value = 240 Mean Value = 83.2 Median Value = 73.25 Standard Deviation = 39.9 Coefficient of Variation = 0.4796 Skewness = 2.041

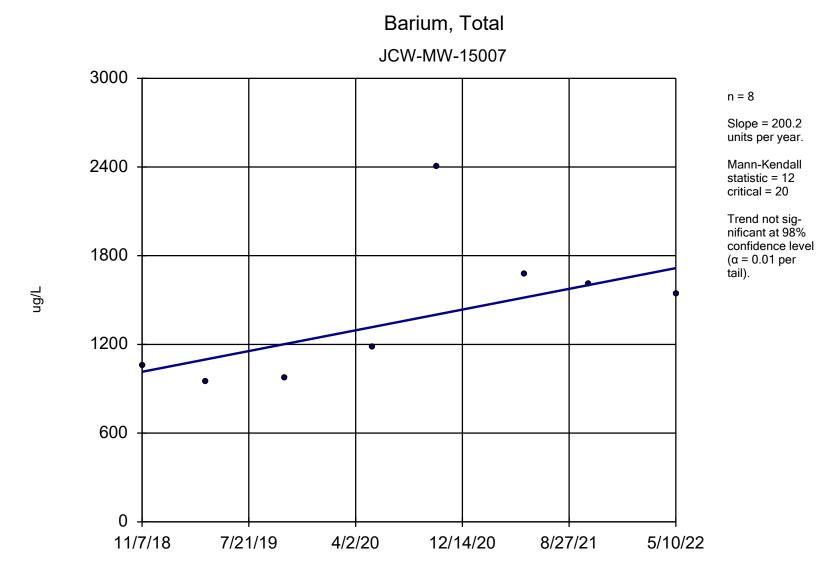
<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-15007	8	0	67	147.5	89.69	84	26.7	0.2978	1.328
JCW-MW-15009	8	0	18	240	104.5	91.5	67.16	0.6427	0.897
JCW-MW-15010	8	0	70	116	84.38	78.75	16.33	0.1935	0.8825
JCW-MW-15028	8	0	48	66	54.25	52.5	5.922	0.1092	1.062



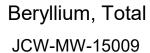
Sen's Slope Estimator Analysis Run 6/10/2022 10:55 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

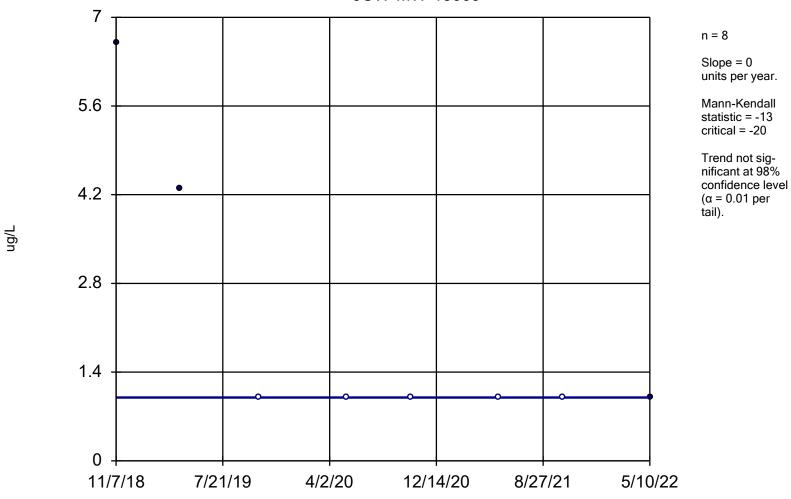


Sen's Slope Estimator Analysis Run 6/10/2022 10:55 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

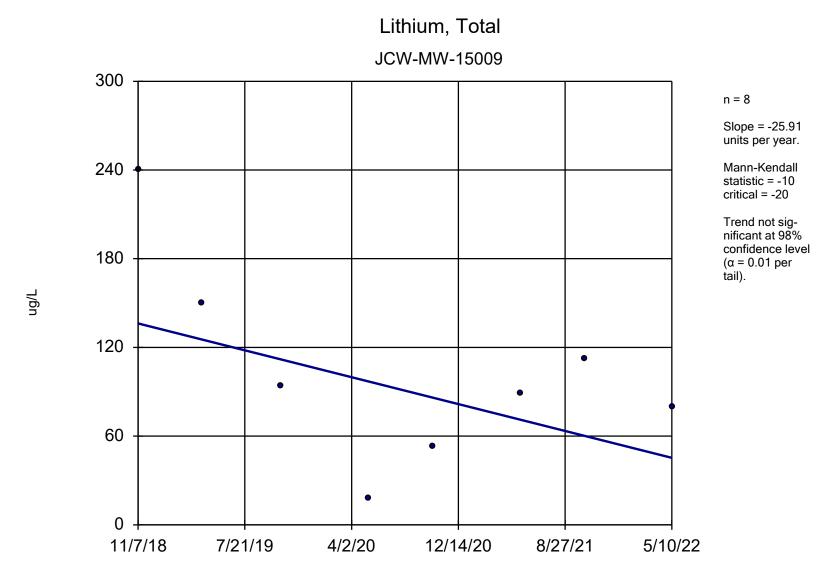


Sen's Slope Estimator Analysis Run 6/10/2022 10:55 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2





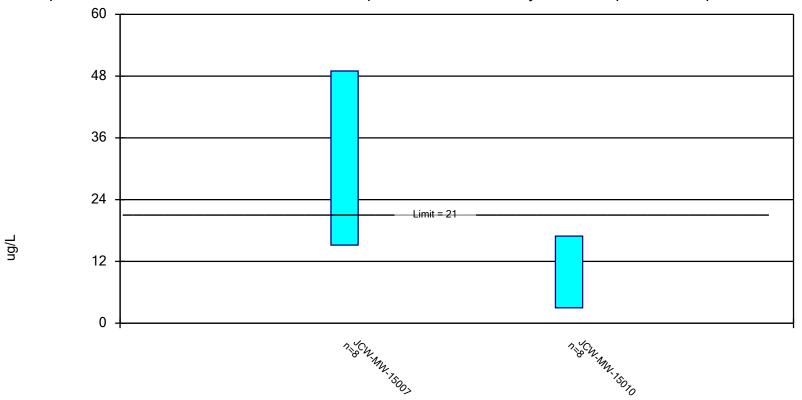
Sen's Slope Estimator Analysis Run 6/10/2022 10:55 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 10:56 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

### 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 6/10/2022 11:01 AM

### **Confidence Interval**

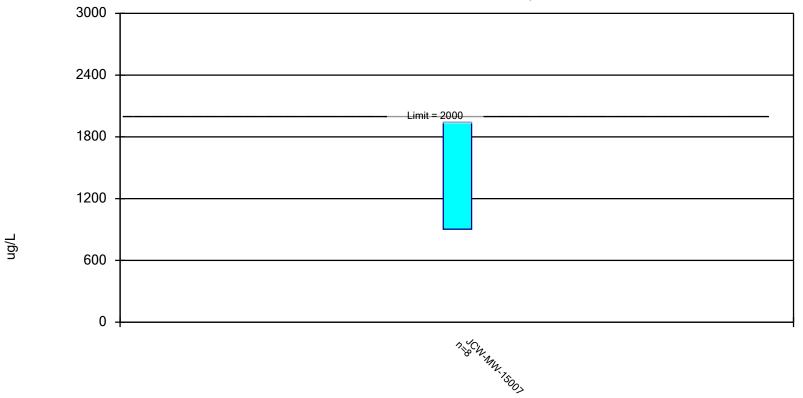
Constituent: Arsenic, Total (ug/L) Analysis Run 6/10/2022 11:02 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-15007	JCW-MW-15010
11/7/2018	46.3	9.5
4/9/2019	9.8	16
10/14/2019		13
10/15/2019	34.5 (D)	
5/14/2020	19	4
10/13/2020	61	4 (D)
5/11/2021		6
5/12/2021	31 (D)	
10/12/2021	31 (D)	
10/13/2021		22
5/10/2022	24	5 (D)
Mean	32.08	9.938
Std. Dev.	15.94	6.571
Upper Lim.	48.97	16.9
Lower Lim.	15.18	2.973

### Parametric Confidence Interval

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



Constituent: Barium, Total Analysis Run 6/10/2022 11:01 AM

### **Confidence Interval**

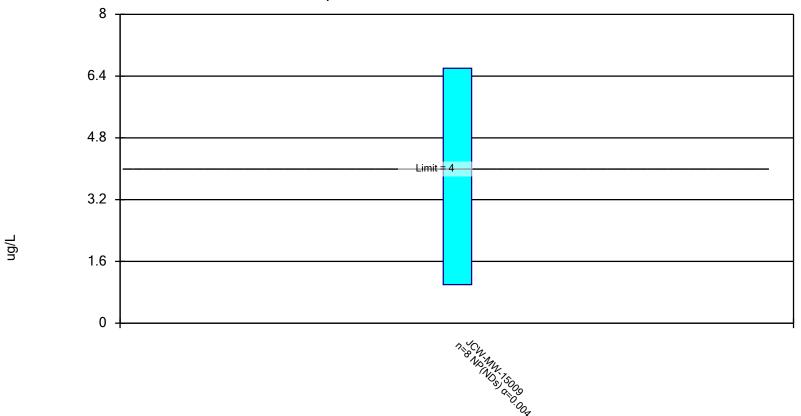
Constituent: Barium, Total (ug/L) Analysis Run 6/10/2022 11:02 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-15007
11/7/2018	1060
4/9/2019	950
10/15/2019	970 (D)
5/14/2020	1180
10/13/2020	2400
5/12/2021	1675 (D)
10/12/2021	1605 (D)
5/10/2022	1540
Mean	1423
Std. Dev.	490.6
Upper Lim.	1942
Lower Lim.	902.5

### Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Beryllium, Total Analysis Run 6/16/2022 10:16 AM

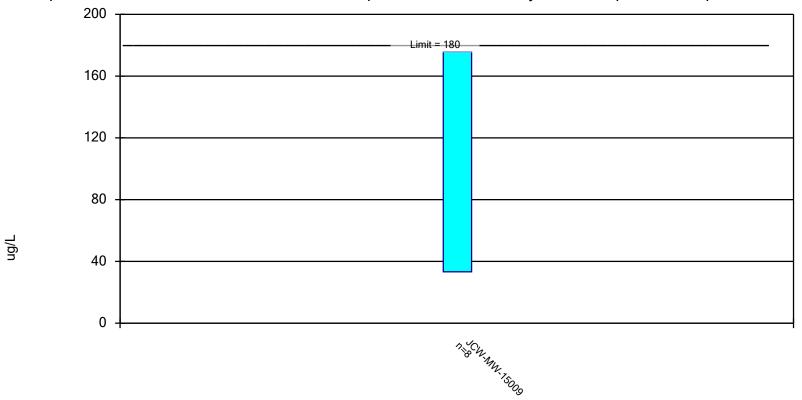
### **Confidence Interval**

Constituent: Beryllium, Total (ug/L) Analysis Run 6/16/2022 10:16 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-15009
11/7/2018	6.6
4/9/2019	4.3
10/15/2019	<1
5/14/2020	<1
10/13/2020	<1
5/12/2021	<1
10/13/2021	<1
5/10/2022	1
Mean	2.113
Std. Dev.	2.15
Upper Lim.	6.6
Lower Lim.	1

### Parametric Confidence Interval

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



Constituent: Lithium, Total Analysis Run 6/10/2022 11:01 AM

### **Confidence Interval**

Constituent: Lithium, Total (ug/L) Analysis Run 6/10/2022 11:02 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-15009
11/7/2018	240
4/9/2019	150
10/15/2019	94
5/14/2020	18
10/13/2020	53
5/12/2021	89
10/13/2021	112
5/10/2022	80
Mean	104.5
Std. Dev.	67.16
Upper Lim.	175.7
Lower Lim.	33.32



## Appendix C Laboratory Analytical Reports



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 25, 2022

Subject: RCRA GROUNDWATER MONITORING – JCW BOTTOM ASH POND WELLS – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0440

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond Wells area on 05/10/2022 for the 2<sup>nd</sup> 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 05/11/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate.

The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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, 22<sup>nd</sup> Edition, 2012.

#### III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. As appropriate, 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:

<u>Acronym</u>	<u>Description</u>
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

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



#### **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 JCW Bottom Ash Pond

**Date Received:** 5/11/2022 **Chemistry Project:** 22-0440

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0440-01	JCW-MW-15007	Groundwater	05/10/2022 03:40 PM	JCW Bottom Ash Pond
22-0440-02	JCW-MW-15009	Groundwater	05/10/2022 02:15 PM	JCW Bottom Ash Pond
22-0440-03	JCW-MW-15010	Groundwater	05/10/2022 12:25 PM	JCW Bottom Ash Pond
22-0440-04	JCW-MW-15028	Groundwater	05/10/2022 02:58 PM	JCW Bottom Ash Pond
22-0440-05	DUP-JCW-BAP	Groundwater	05/10/2022 12:00 AM	JCW Bottom Ash Pond
22-0440-06	JCW-MW-15009 MS	Groundwater	05/10/2022 02:15 PM	JCW Bottom Ash Pond
22-0440-07	JCW-MW-15009 MSD	Groundwater	05/10/2022 02:15 PM	JCW Bottom Ash Pond
22-0440-08	EB-JCW-BAP	Water	05/10/2022 03:57 PM	JCW Bottom Ash Pond
22-0440-09	FB-JCW-BAP	Water	05/10/2022 04:02 PM	JCW Bottom Ash Pond

05/25/22



Sample Site: JCW Bottom Ash Pond Laboratory Project: 22-0440

 Field Sample ID:
 JCW-MW-15007
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0440-01
 Collect Time:
 03:40 PM

Metals by EPA 6020B: CCR Rule Appe	endix III-IV To	otal Metals	s Ехр	Aliquot #: 22-0	440-01-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	24		ug/L	1.0	05/13/2022	AB22-0513-11
Barium	1540		ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Boron	255		ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	275000		ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	3		ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND		ug/L	6.0	05/13/2022	AB22-0513-11
Copper	3		ug/L	1.0	05/13/2022	AB22-0513-11
Iron	9530		ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	81		ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	33200		ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	5		ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	18		ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	11600		ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	2310000		ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	28		ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND		ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, Aqueou	ıs			Aliquot #: 22-0	440-01-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule Analys	te List, CI, F,	SO4, Aqu	ieous	Aliquot #: 22-0	440-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	3470000		ug/L	1000.0	05/19/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	28400		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	440-01-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	7000		mg/L	10.0	05/11/2022	AB22-0511-09
	00	0440 Bogo	E of 04			



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Bottom Ash Pond Laboratory Project: 22-0440

 Field Sample ID:
 JCW-MW-15007
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0440-01
 Collect Time:
 03:40 PM

Alkalinity by SM 2320B	Aliquot #: 22-0-	440-01-C04-A01	Analyst: DLS		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	459000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	459000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



A CENTURY OF EXCELLENCE

Report Date: 05/25/22

Sample Site: **JCW Bottom Ash Pond** Laboratory Project: 22-0440

Field Sample ID: JCW-MW-15009 Collect Date: 05/10/2022 Lab Sample ID: 22-0440-02 Collect Time: 02:15 PM

Metals by EPA 6020B: CCR Rule Appe	endix III-IV Tot	al Metals	s Ехр	Aliquot #: 22-0	440-02-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Barium	17		ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	1		ug/L	1.0	05/13/2022	AB22-0513-11
Boron	202		ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	526000		ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	1		ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND		ug/L	6.0	05/13/2022	AB22-0513-11
Copper	3		ug/L	1.0	05/13/2022	AB22-0513-11
Iron	15700		ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	80		ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	27400		ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	ND		ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	29		ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	11000		ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	24200		ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	3		ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND		ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, Aqueou	ıs			Aliquot #: 22-0	440-02-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule Analy	te List, Cl, F,	SO4, Aqu	ieous	Aliquot #: 22-0	440-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	34500		ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	1310000		ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	440-02-C03-A01	Analyst: CLF
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	2270		mg/L	10.0	05/11/2022	AB22-0511-09
	22-0	0440 Page 1	7 of 21			



A CENTURY OF EXCELLENCE

#### **Analytical Report**

Report Date: 05/25/22

Sample Site: **JCW Bottom Ash Pond** 

Laboratory Project: 22-0440 Field Sample ID: JCW-MW-15009 Collect Date: 05/10/2022 Lab Sample ID: 22-0440-02 Collect Time: 02:15 PM

Alkalinity by SM 2320B	Aliquot #: 22-0	440-02-C04-A01	Analyst: DLS		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	114000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	114000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



Report Date: 05/25/22

Sample Site: **JCW Bottom Ash Pond** 

Laboratory Project: 22-0440 Field Sample ID: JCW-MW-15010 Collect Date: 05/10/2022 Lab Sample ID: 22-0440-03 Collect Time: 12:25 PM

				Allquot #. 22-0	440-03-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Antimony	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	5		ug/L	1.0	05/13/2022	AB22-0513-11
Barium	219		ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Boron	1200		ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	165000		ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND		ug/L	6.0	05/13/2022	AB22-0513-11
Copper	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Iron	400		ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	74		ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	24800		ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	ND		ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	8		ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	10300		ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	49000		ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND		ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, Aqued	ous			Aliquot #: 22-0	440-03-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND		ug/L	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule Anal	yte List, Cl, F,	SO4, Aqu	ieous	Aliquot #: 22-0	440-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	41700		ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	167000		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	440-03-C03-A01	Analyst: CLF
				-		-
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking



A CENTURY OF EXCELLENCE

# **Analytical Report**

Report Date: 05/25/22

Sample Site: **JCW Bottom Ash Pond** 

Laboratory Project: 22-0440 Field Sample ID: JCW-MW-15010 Collect Date: 05/10/2022 Lab Sample ID: 22-0440-03 Collect Time: 12:25 PM

Alkalinity by SM 2320B	Aliquot #: 22-0	440-03-C04-A01	Analyst: DLS		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	424000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	424000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04

05/25/22



Sample Site: JCW Bottom Ash Pond Laboratory Project: 22-0440

 Field Sample ID:
 JCW-MW-15028
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0440-04
 Collect Time:
 02:58 PM

Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	Ехр	Aliquot #: 22-0	440-04-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Barium	351		ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Boron	633		ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	199000		ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	2		ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND		ug/L	6.0	05/13/2022	AB22-0513-11
Copper	1		ug/L	1.0	05/13/2022	AB22-0513-11
Iron	399		ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	54		ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	36700		ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	ND		ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	11		ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	10500		ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	605000		ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	11		ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND		ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, Aqueous	S			Aliquot #: 22-0	440-04-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule Analyte	e List, Cl, F,	SO4, Aqu	eous	Aliquot #: 22-0	440-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1070000		ug/L	1000.0	05/19/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	93700		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	440-04-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
- a. a		•			·,	



A CENTURY OF EXCELLENCE

# **Analytical Report**

Report Date: 05/25/22

Sample Site: **JCW Bottom Ash Pond** 

Laboratory Project: 22-0440 Field Sample ID: JCW-MW-15028 Collect Date: 05/10/2022 Lab Sample ID: 22-0440-04 Collect Time: 02:58 PM

Alkalinity by SM 2320B	Aliquot #: 22-0	440-04-C04-A01	Analyst: DLS		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	323000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	323000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04

05/25/22



Count on Us®

Sample Site: JCW Bottom Ash Pond Laboratory Project: 22-0440

Field Sample ID: DUP-JCW-BAP Collect Date: 05/10/2022 Lab Sample ID: 22-0440-05 Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	440-05-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	5		ug/L	1.0	05/13/2022	AB22-0513-11
Barium	220		ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Boron	1200		ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	165000		ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	1		ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND		ug/L	6.0	05/13/2022	AB22-0513-11
Copper	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Iron	372		ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	73		ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	24600		ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	ND		ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	8		ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	10500		ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND		ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND		ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	49700		ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	ND		ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND		ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, Aqueou	S			Aliquot #: 22-0	440-05-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule Analys	te List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	440-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	41900		ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	167000		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	440-05-C03-A01	Analyst: CLF
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	806		mg/L	10.0	05/11/2022	AB22-0511-09
	22-(	0440 Page 1	3 of 21			



A CENTURY OF EXCELLENCE

# **Analytical Report**

Report Date: 05/25/22

Sample Site: **JCW Bottom Ash Pond** 

Laboratory Project: 22-0440 Field Sample ID: **DUP-JCW-BAP** Collect Date: 05/10/2022 Lab Sample ID: 22-0440-05 Collect Time: 12:00 AM

Alkalinity by SM 2320B	Aliquot #: 22-0	Analyst: DLS			
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	424000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	424000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



Report Date: 05/25/22

22-0440

Sample Site: **JCW Bottom Ash Pond** 

Laboratory Project: Field Sample ID: JCW-MW-15009 MS Collect Date: 05/10/2022 Lab Sample ID: 22-0440-06 Collect Time: 02:15 PM

Metals by EPA 6020B: CCR Rule Ap	pendix III-IV To	tal Metals	s Exp	Aliquot #: 22-0	440-06-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	103		%	1.0	05/13/2022	AB22-0513-11
Arsenic	109		%	1.0	05/13/2022	AB22-0513-11
Barium	106		%	5.0	05/13/2022	AB22-0513-11
Beryllium	90		%	1.0	05/13/2022	AB22-0513-11
Boron	100		%	20.0	05/13/2022	AB22-0513-11
Cadmium	102		%	0.2	05/13/2022	AB22-0513-11
Calcium	102		%	1000.0	05/13/2022	AB22-0513-11
Chromium	107		%	1.0	05/13/2022	AB22-0513-11
Cobalt	106		%	6.0	05/13/2022	AB22-0513-11
Copper	96		%	1.0	05/13/2022	AB22-0513-11
Iron	111		%	20.0	05/13/2022	AB22-0513-11
Lead	95		%	1.0	05/13/2022	AB22-0513-11
Lithium	93		%	10.0	05/13/2022	AB22-0513-11
Magnesium	107		%	1000.0	05/13/2022	AB22-0513-11
Molybdenum	113		%	5.0	05/13/2022	AB22-0513-11
Nickel	98		%	2.0	05/13/2022	AB22-0513-11
Potassium	105		%	100.0	05/13/2022	AB22-0513-11
Selenium	79		%	1.0	05/13/2022	AB22-0513-11
Silver	98.0		%	0.2	05/13/2022	AB22-0513-11
Sodium	107		%	1000.0	05/13/2022	AB22-0513-11
Thallium	97		%	2.0	05/13/2022	AB22-0513-11
Vanadium	112		%	2.0	05/13/2022	AB22-0513-11
Zinc	97		%	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, Aque	ous			Aliquot #: 22-0	440-06-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	100.0		%	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule Ana	alyte List, Cl, F,	SO4, Aqı	ieous	Aliquot #: 22-0	440-06-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	102		%	1000.0	05/18/2022	AB22-0518-14
Fluoride	84		%	1000.0	05/18/2022	AB22-0518-14
Sulfate	97		%	1000.0	05/19/2022	AB22-0518-14
Alkalinity by SM 2320B				Aliquot #: 22-0	440-06-C03-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	96.3	_	%	10000.0	05/17/2022	AB22-0517-04
	<u>22-</u>	0440 Page 1	5 of 21			



05/25/22

Sample Site: **JCW Bottom Ash Pond** Laboratory Project: 22-0440 Field Sample ID: JCW-MW-15009 MSD

Collect Date: 05/10/2022 Collect Time: 02:15 PM

Lab Sample ID: 22-0440-07 Matrix: Groundwater

Metals by EPA 6020B: CCR Rul	e Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	440-07-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	99		%	1.0	05/13/2022	AB22-0513-11
Arsenic	112		%	1.0	05/13/2022	AB22-0513-11
Barium	98		%	5.0	05/13/2022	AB22-0513-11
Beryllium	91		%	1.0	05/13/2022	AB22-0513-11
Boron	95		%	20.0	05/13/2022	AB22-0513-11
Cadmium	93.9		%	0.2	05/13/2022	AB22-0513-11
Calcium	102		%	1000.0	05/13/2022	AB22-0513-11
Chromium	113		%	1.0	05/13/2022	AB22-0513-11
Cobalt	109		%	6.0	05/13/2022	AB22-0513-11
Copper	99		%	1.0	05/13/2022	AB22-0513-11
Iron	108		%	20.0	05/13/2022	AB22-0513-11
Lead	94		%	1.0	05/13/2022	AB22-0513-11
Lithium	97		%	10.0	05/13/2022	AB22-0513-11
Magnesium	110		%	1000.0	05/13/2022	AB22-0513-11
Molybdenum	112		%	5.0	05/13/2022	AB22-0513-11
Nickel	103		%	2.0	05/13/2022	AB22-0513-11
Potassium	105		%	100.0	05/13/2022	AB22-0513-11
Selenium	83		% 1.0 05/13		05/13/2022	2 AB22-0513-11
Silver	98.6		%	0.2	05/13/2022	AB22-0513-11
Sodium	109		% 1000.0	05/13/2022	AB22-0513-11	
Thallium	98		%	2.0	05/13/2022	AB22-0513-11
Vanadium	117		%	2.0	05/13/2022	AB22-0513-11
Zinc	101		%	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total, A	Aqueous			Aliquot #: 22-0	440-07-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	108		%	0.2	05/17/2022	AB22-0517-07
Anions by EPA 300.0 CCR Rule	Analyte List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	440-07-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	102		%	1000.0	05/18/2022	AB22-0518-14
Fluoride	82		%	1000.0	05/18/2022	AB22-0518-14
Sulfate	99		%	1000.0	05/19/2022	AB22-0518-14
Alkalinity by SM 2320B				Aliquot #: 22-0	440-07-C03-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
` ,		riag			_	_
Alkalinity Total	97.7		%	10000.0	05/17/2022	AB22-0517-04
	22-0	0440 Page 1	6 of 21			



05/25/22



CENTURY OF EXCELLENCE

Sample Site:JCW Bottom Ash PondLaboratory Project:22-0440Field Sample ID:EB-JCW-BAPCollect Date:05/10/2022Lab Sample ID:22-0440-08Collect Time:03:57 PM

Matrix: Water

Metals by EPA 6020B: CCR R	Rule Appendix III-IV Tot	Aliquot #: 22-0	440-08-C01-A01	Analyst: EB	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Barium	ND	ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Boron	ND	ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND	ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	ND	ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND	ug/L	6.0	05/13/2022	AB22-0513-11
Copper	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Iron	ND	ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	ND	ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	ND	ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	ND	ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	ND	ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	ND	ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND	ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	ND	ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND	ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	ND	ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND	ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, Total	I, Aqueous		Aliquot #: 22-0	440-08-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	05/17/2022	AB22-0517-07



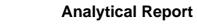
05/25/22



Sample Site:JCW Bottom Ash PondLaboratory Project:22-0440Field Sample ID:FB-JCW-BAPCollect Date:05/10/2022Lab Sample ID:22-0440-09Collect Time:04:02 PM

Matrix: Water

Metals by EPA 6020B: CCR	Rule Appendix III-IV To	tal Metals Exp	Aliquot #: 22-0	0440-09-C01-A01	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Arsenic	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Barium	ND	ug/L	5.0	05/13/2022	AB22-0513-11
Beryllium	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Boron	ND	ug/L	20.0	05/13/2022	AB22-0513-11
Cadmium	ND	ug/L	0.2	05/13/2022	AB22-0513-11
Calcium	ND	ug/L	1000.0	05/13/2022	AB22-0513-11
Chromium	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Cobalt	ND	ug/L	6.0	05/13/2022	AB22-0513-11
Copper	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Iron	ND	ug/L	20.0	05/13/2022	AB22-0513-11
Lead	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Lithium	ND	ug/L	10.0	05/13/2022	AB22-0513-11
Magnesium	ND	ug/L	1000.0	05/13/2022	AB22-0513-11
Molybdenum	ND	ug/L	5.0	05/13/2022	AB22-0513-11
Nickel	ND	ug/L	2.0	05/13/2022	AB22-0513-11
Potassium	ND	ug/L	100.0	05/13/2022	AB22-0513-11
Selenium	ND	ug/L	1.0	05/13/2022	AB22-0513-11
Silver	ND	ug/L	0.2	05/13/2022	AB22-0513-11
Sodium	ND	ug/L	1000.0	05/13/2022	AB22-0513-11
Thallium	ND	ug/L	2.0	05/13/2022	AB22-0513-11
Vanadium	ND	ug/L	2.0	05/13/2022	AB22-0513-11
Zinc	ND	ug/L	10.0	05/13/2022	AB22-0513-11
Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	)440-09-C01-A02	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	05/17/2022	AB22-0517-07





**Report Date:** 05/25/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

# Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 3 ATTACHMENT A

# TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

	Project Log-In Number:	12-0440								
	Inspection Date: 5-11-22		Inspection By:							
	Sample Origin/Project Name:	CW Bottom	Ash pord							
	Shipment Delivered By: Enter the t	ype of shipment ca	rrier.							
	Pony FedEx Other/Hand Carry (whom) _		S USPS	Airl	borne					
	Tracking Number:		_ Shipping Form Atta	ched; Yes	No					
	Shipping Containers: Enter the type	and number of sh	ipping containers received.							
			Custom Case	Envelop	e/Mailer					
	Loose/Unpackaged Containe		Other							
	Condition of Shipment: Enter the as	s-received conditio	n of the shipment container.							
	Damaged Shipment Observe	d: None			king					
	Shipment Security: Enter if any of the shipping containers were opened before receipt.									
	Shipping Containers Receive			0,1						
	Enclosed Documents: Enter the type of documents enclosed with the shipment.									
	CoC Work Req			Other						
paper	Temperature of Containers: Measure the temperature of several sample containers.									
222420	As-Received Temperature Ra	ange 2.2 4.6°	Samples Received on I	ce: Yes 😢 N	То					
3-1-23	M&TE # and Expiration 015	5484 10.14	22							
	Number and Type of Containers: Enter the total number of sample containers received.									
					T and the					
	Container Type Water VOA (40mL or 60mL)	<u>Soil</u>	Other	Broken	Leakin					
	Quart/Liter (g/p)	_			-					
	9-oz (amber glass jar)									
	2-oz (amber glass)									
	125 mL (plastic)									
	24 mL vial (glass)	_		1						
	500 mL (plastic)	_								
	Other 250ml 5	_			_					

# **CHAIN OF CUSTODY**



#### CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

SAMPLING SITE / CUSTOMER:					PROJECT NUMBER:	SAP CC or V	WO#:							Δ	NAI	YSI	SRE	OUES	STED	
Q2-2	22 JCW Botto	m Ash Pond			22-0440	REQUESTER: Harold Register					(Attach List if More Space is Needed)						QA REQUIREMENT:			
and the second s					TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ STANDARD ☒ OTHER										□ NPDES  ⊠ TNI					
SEN	O REPORT TO:	Caleb Batts			email: phone:						1							□ ISO 17025		
18	COPY TO:	Harold Regi	ster		MATRIX CODES: GW = Groundwater OX = Other			C	ONT	CAI	NER	s								☐ 10 CFR 50 APP, B
		TRC			WW = Wastewater SL = Sludge W = Water / Aqueous Liquid A = Air	e			PRE	SEF	RVA	ΓΙVE	tals			-				☐ INTERNAL INFO
	LAB	SAMPLE COL	LECTION	RIX	S = Soil / General Solid   WP = Wipe   O = Oil   WT = General	eral Waste	TOTAL#						Total Metals	suc		Alkalinity				□ OTHER
SA	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LOC	CATION	TOT	None	HINO	H2SO	NaOH	МеОН	Tota	Anions	TDS	Alka				REMARKS
	22-0440-01	slolos	15ic	GW	JCW-MW-15007		5	4	1				x	x	x	x				
	-02	slw/s	1415	GW	JCW-MW-15009		5	4	1				x	x	x	x				
	-03	5/10/25	7061	GW	JCW-MW-15010		5	4	1	Ш			x	x	x	x				
	-04	5/10/35	1458	GW	JCW-MW-15028		5	4	1				x	x	x	x				
	-05	skolos	5-2-1	GW	DUP-JCW-BAP		5	4	1				x	x	x	x				
	-06	5/10137	just	GW	JCW-MW-15009 MS		4	3	1				x	x		x				1
	-07	silolo	1415	GW	JCW-MW-15009 MSD		4	3	1				x	x		x				
	-08	5/10/3	1557	W	EB-JCW-BAP		1		1				x							
	-09	5/6/2-	1602	w	FB-JCW-BAP		1		1				x							
								-					1							
							-			-	+	H	k-	H		-			-	
RELI	IQUISHED BY:	7	- 5/		10 930 R	ECEIVED BY:								DMM						6.43
RELIN	QUISHED BY:		1	DATE/		ECEIVED BY:							1					□ N e°C		Due Date: 10-14-22



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 25, 2022

Subject: RCRA GROUNDWATER MONITORING – DEK-JCW BACKGROUND WELLS – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

**Chemistry Project: 22-0443** 

TRC Environmental, Inc. conducted groundwater monitoring at the Karn/Weadock Background Wells area on 05/02/2022 and 05/03/2022, for the 2<sup>nd</sup> Quarter monitoring 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 05/04/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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, 22<sup>nd</sup> 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:

<u>Acronym</u>	<u>Description</u>
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

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



#### **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 JCW-DEK Background Wells

**Date Received:** 5/04/2022 **Chemistry Project:** 22-0443

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0443-01	MW-15002	Groundwater	05/02/2022 05:24 PM	DEK JCW Background
22-0443-02	MW-15008	Groundwater	05/02/2022 01:45 PM	DEK JCW Background
22-0443-03	MW-15016	Groundwater	05/03/2022 08:37 AM	DEK JCW Background
22-0443-04	MW-15019	Groundwater	05/02/2022 03:20 PM	DEK JCW Background
22-0443-05	DUP-Background	Groundwater	05/02/2022 12:00 AM	DEK JCW Background
22-0443-06	FB- Background	Water	05/02/2022 01:45 PM	DEK JCW Background

Report Date:

05/25/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15002
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-01
 Collect Time:
 05:24 PM

Mercury by EPA 7470A, Total, Aqueou	s			Aliquot #: 22-0	0443-01-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Exp	Aliquot #: 22-0	)443-01-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	14		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	682		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	103		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	238000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	3		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	3		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	16100		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	16		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	14		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	54		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	15		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	23		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	te List, Cl, F,	SO4, Aqı	ueous	Aliquot #: 22-0	)443-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	2210000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	6000		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	)443-01-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids		9			_	_
Total Dissolved Solids	4240		mg/L	10.0	05/05/2022	AB22-0505-01

Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15008
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-02
 Collect Time:
 01:45 PM

Mercury by EPA 7470A, Total, Aqueous	s			Aliquot #: 22-0	0443-02-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	otal Metal	s Exp	Aliquot #: 22-0	)443-02-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	52		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	112		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	89500		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	15500		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	16		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	5		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	6		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqı	ueous	Aliquot #: 22-0	)443-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	197000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	4990		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0	)443-02-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	783	9	mg/L	10.0	05/05/2022	AB22-0505-02

Report Date:

05/25/22



**Laboratory Services** A CENTURY OF EXCELLENCE

Sample Site:

**DEK JCW Background** Laboratory Project: 22-0443 Field Sample ID: MW-15016 Collect Date: 05/03/2022 Lab Sample ID: 22-0443-03 Collect Time: 08:37 AM

Mercury by EPA 7470A, Total, Aqueous		Aliquot #: 22-0	0443-03-C01-A01	1 Analyst: CLH		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metal	s Exp	Aliquot #: 22-0	)443-03-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	8		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	72		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	329		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	216000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	5		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	8020		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	80		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	13		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	3		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqı	ueous	Aliquot #: 22-0	)443-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	243000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	267000		ug/L	1000.0	05/17/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	)443-03-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1390		mg/L	10.0	05/05/2022	AB22-0505-02

Report Date:

05/25/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15019
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-04
 Collect Time:
 03:20 PM

Mercury by EPA 7470A, Total, Aqueous		Aliquot #: 22-0	0443-04-C01-A01	1 Analyst: CLH		
Parameter(s)	Result Flag Units		RL	Analysis Date	Tracking	
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals				Aliquot #: 22-0	)443-04-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	308		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	236		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	139000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	21000		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	12		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	8		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	3		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aq	ueous	Aliquot #: 22-0	)443-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	324000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	62500		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0	)443-04-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1200	9	mg/L	10.0	05/05/2022	AB22-0505-02



A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

Field Sample ID: **DUP-Background** 

Lab Sample ID: 22-0443-05 Matrix: Groundwater Collect Date: 05/02/2022

Collect Time: 12:00 AM

Report Date:

05/25/22

Mercury by EPA 7470A, Total, Aqueous		Aliquot #: 22-0	443-05-C01-A01	Analyst: CLH		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Apper	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	443-05-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	58		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	125		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	103000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	16600		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	17		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	5		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	6		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyte	List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	443-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	198000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	4950		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	443-05-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	786	- 3	mg/L	10.0	05/05/2022	AB22-0505-02



05/25/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

Field Sample ID: FB- Background Collect Date: 05/02/2022 Lab Sample ID: 22-0443-06 Collect Time: 01:45 PM

Matrix: Water

Mercury by EPA 7470A, Total, Aqueous				Aliquot #: 22-0	443-06-C01-A01	11 Analyst: CLH		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking		
Mercury	ND	ι	ug/L	0.2	05/10/2022	AB22-0510-04		
Metals by EPA 6020B: CCR Rule Ap	Aliquot #: 22-0	443-06-C01-A02	Analyst: EB					
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking		
Antimony	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Arsenic	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Barium	ND	ι	ug/L	5.0	05/11/2022	AB22-0511-14		
Beryllium	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Boron	ND	ι	ug/L	20.0	05/11/2022	AB22-0511-14		
Cadmium	ND	ι	ug/L	0.2	05/11/2022	AB22-0511-14		
Calcium	ND	ι	ug/L	1000.0	05/12/2022	AB22-0511-14		
Chromium	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Cobalt	ND	ι	ug/L	6.0	05/11/2022	AB22-0511-14		
Copper	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Iron	ND	ι	ug/L	20.0	05/11/2022	AB22-0511-14		
Lead	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Lithium	ND	ι	ug/L	10.0	05/11/2022	AB22-0511-14		
Molybdenum	ND	ι	ug/L	5.0	05/11/2022	AB22-0511-14		
Nickel	ND	ι	ug/L	2.0	05/11/2022	AB22-0511-14		
Selenium	ND	ι	ug/L	1.0	05/11/2022	AB22-0511-14		
Silver	ND	ι	ug/L	0.2	05/11/2022	AB22-0511-14		
Thallium	ND	ι	ug/L	2.0	05/11/2022	AB22-0511-14		
Vanadium	ND	ι	ug/L	2.0	05/11/2022	AB22-0511-14		
Zinc	ND	ι	ug/L	10.0	05/11/2022	AB22-0511-14		





**Report Date:** 05/25/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

# Chemistry Department

General Standard Operating Procedure

PROC CHEM-1,2.01 PAGE 1 OF 2 REVISION 2 ATTACHMENT A

TITLE:	SAMPL	E LOG-I	N - SHIPM	ENT INSPE	CTION FORM
~ ~ ~ ~ ~ ~ ~ ~ ~	MANAGE SHE		AA I MAMMA AIR		

Insp	ection Date: 5.	4.22		ion By: dh	M	
	ple Origin/Project Nat					
	ment Delivered By: E					
Ship	Pony	FedEx V		USPS	A in	oorne
	Other/Hand Carry (	7	UF3	03F3		Joine
	Tracking Number:		18310 st	nipping Form Attac	hed: Yes	No
Ship	ping Containers: Ente	r the type and num	ber of shipping cont	ainers received.		
	Cooler √		Cust		Envelope	e/Mailer
	Loose/Unpackaged			er	Market of the Control	
Con	dition of Shipment: En	ter the as-received	condition of the shi	pment container.		
	Damaged Shipment	Observed: None	1	Dented	Leal	king
	Other	7.7.2.4.15.40.7.0000.8	¥			
	Shipping Containers	n ' 1 0		Sealed V		
Encl	osed Documents: Enter	r the type of docum	nents enclosed with	the shipment.	<b></b>	
	CoC W	r the type of docum	nents enclosed with	the shipment,	Other	
Tem	osed Documents: Enter	r the type of docum  /ork Request  : Measure the temp  orature 29 - 4	Air Dependence of several section of Sample	the shipment,  ata Sheet  ample containers.  s Received on Ice:	Yes V No	
Tem	CoC W perature of Containers  As-Received Tempe	r the type of docum /ork Request	Air Deperature of several section 1970. Sample 5402 6.3. Internal control of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of sample section of section of sample section of sectio	the shipment,  ata Sheet  ample containers.  s Received on Ice:	Yes V No	Leaking
Num	Osed Documents: Enter  CoC W  perature of Containers  As-Received Tempe  METER ED  ber and Type of Conta	r the type of docum /ork Request	Air Deperature of several section 1992 Sample 5402 6.3- otal number of samp	the shipment.  ata Sheet  ample containers.  s Received on Ice: 2 2	Yes No_	<u>L</u> eaking
Num PH Papa	osed Documents: Enter  CoC W  perature of Containers  As-Received Tempe  METE F E D  ber and Type of Conta  Container Type  VOA (40mL or 60mL  Quart/Liter (g/p)	r the type of document of the type of document of the temperature 29-4 (1. Dotc: U.S. iners: Enter the temperature Series (1. Dotc: U.S. iners: Enter the temperature (1. Dotc: U.S. iners: Enter the	Air Deperature of several section 1992 Sample 5402 6.3- otal number of samp	the shipment.  ata Sheet  ample containers.  s Received on Ice: 2 2	Yes No_	Leaking
Num PH Papa	osed Documents: Enter  CoC W  perature of Containers  As-Received Tempe  METE F E  ber and Type of Conta  Container Type  VOA (40mL or 60mL  Quart/Liter (g/p)  9-oz (amber glass ja)	r the type of document of the type of document of the temperature 29-4 (1. Dotc: U.S. iners: Enter the temperature Series (1. Dotc: U.S. iners: Enter the temperature (1. Dotc: U.S. iners: Enter the	Air Deperature of several section 1992 Sample 5402 6.3- otal number of samp	the shipment.  ata Sheet  ample containers.  s Received on Ice: 2 2	Yes No_	<u>Leaking</u>
Num  PH Papar  COH NO: 13-640-508	osed Documents: Enter  CoC W  perature of Containers  As-Received Tempe  METE F D  ber and Type of Conta  Container Type  VOA (40mL or 60mL  Quart/Liter (g/p)  9-oz (amber glass)	r the type of document of the type of document of the temperature 29-4 (1. Dotc: U.S. iners: Enter the temperature Sentence (2. Document of the type of type of the type of type of the type of the type of the type of type of the type of the type of type of the type of type o	Air Deperature of several section 1992 Sample 5402 6.3- otal number of samp	the shipment.  ata Sheet  ample containers.  s Received on Ice: 2 2	Yes No_	<u>Leaking</u>
Num  PH Paper  COH NO: 13-640-508  0.0-14.0	osed Documents: Enter  CoC W  perature of Containers  As-Received Tempe  METER ED  ber and Type of Conta  Container Type  VOA (40mL or 60mL  Quart/Liter (g/p)  9-oz (amber glass ja  2-oz (amber glass)  125 mL (plastic)	r the type of document of the type of document of the temperature 29-4 (1. Dotc: U.S. iners: Enter the temperature Series (1. Dotc: U.S. iners: Enter the temperature (1. Dotc: U.S. iners: Enter the	Air Deperature of several section 1992 Sample 5402 6.3- otal number of samp	the shipment.  ata Sheet  ample containers.  s Received on Ice: 2 2	Yes No_	<u>Leaking</u>
Num  PH Papar  COH NO: 13-640-508	osed Documents: Enter  CoC W  perature of Containers  As-Received Tempe  METE F D  ber and Type of Conta  Container Type  VOA (40mL or 60mL  Quart/Liter (g/p)  9-oz (amber glass)	r the type of document of the type of document of the temperature 29-4 (1. Dotc: U.S. iners: Enter the temperature Sentence (2. Document of the type of type of the type of type of the type of the type of the type of type of the type of the type of type of the type of type o	Air Deperature of several section 1992 Sample 5402 6.3- otal number of samp	the shipment.  ata Sheet  ample containers.  s Received on Ice: 2 2	Yes No_	Leaking

# **CHAIN OF CUSTODY**



# CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page of

	PLING SITE / CU				PROJECT NUMBER:	SAI CC 01 WOW.							ANALYSIS REQUESTED					ED	QA REQUIREMENT:				
Q2-2	022 JCW-DEK	Background W	ells		22-0443	REQUESTER	: Haro	ld F	legis	ster			(Attach List if More Space is Needed)							QA REQUIREMENT:			
SAM	PLING TEAM:				TURNAROUND TIME REQUIRED:	NDARD ⊠ OTHER												□ NPDES  □ TNI					
SFN	D REPORT TO:	Caleb Batts			email:	phone:						7								☐ ISO 17025			
-	COPY TO:	Harold Regis	ter		MATRIX CODES:		CONTAINERS										☐ 10 CFR 50 APP. B						
	00.1.10.	TRC	.01	_	GW = Groundwater OX = Other WW = Wastewater SL = Sludg		PRESERVATIVE		ls							☐ INTERNAL INFO							
	LAB	SAMPLE COLI	LECTION	XIX	W = Water / Aqueous Liquid   A = Air   S = Soil / General Solid   WP = Wipe   O = Oil   WT = General Solid   WT		TOTAL #	#			Il Metals	suc						□ OTHER					
S.	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOT	None	None		None HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub>		H <sub>2</sub> SC NaOF HCI		HCI MeOl		Total ]	Anions	TDS	TDS			REMARKS
	22-0443-01	5/2/22	1724	GW	MW-15002		4	3	1				x	x	x								
	-02	5/2/22	1345	GW	MW-15008		4	3	1				x	x	x								
	-03	5/3/202	837	GW	MW-15016		4	3	1				x	x	x								
	-04	5/422	1520	GW	MW-15019		4	3	1				x	x	x								
	-05	5/2/22	_	GW	DUP-Background		4	3	1				х	х	x								
	-06	5/2/22	1345	w	FB- Background		1						х										
		3 1																					
RELI	NQUISHED BY:	Sch va	the	DATE/	1- 1	RECEIVED BY:	-						СО	MMI	ENTS	3:							
RELI	NQUISHED BY:		1.3	DATE/	TIME:	RECEIVED BY:							100							E#: 015402			
	61 G	<b>c</b>	•	5-0	4-2022 10:25	22-0443 Page 13 o							Ter	npera	iture:	2.4	-4.6	°C	Cal. I	Due Date: 6-3-22			



# **Environment Testing America**

# **ANALYTICAL REPORT**

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166414-1

Client Project/Site: Karn/Weadock CCR Bottom Ash Pond

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/23/2022 8:26:30 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

..... Links .....

Review your project results through

Have a Question?



Visit us at:

www.eurofinsus.com/Env

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

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

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	13
QC Sample Results	14
QC Association Summary	16
Lab Chronicle	17
Certification Summary	19
Chain of Custody	20
Receipt Checklists	25

6

4

5

7

9

10

12

13

114

#### **Definitions/Glossary**

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

#### **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.
--------------	---

Example 2 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

Ŀ

**5** 

6

0

11

12

13

| 14

#### **Case Narrative**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Job ID: 240-166414-1

**Laboratory: Eurofins Canton** 

**Narrative** 

Job Narrative 240-166414-1

#### Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226\_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

#### Receipt

The samples were received on 5/12/2022 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 0.8° C, 0.9° C and 1.8° C.

#### **RAD**

Method 903.0: Radium-226 batch 565788: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

JCW-MW-15007 (240-166414-1), JCW-MW-15009 (240-166414-2), JCW-MW-15010 (240-166414-3), JCW-MW-15028 (240-166414-4), DUP-02 (240-166414-5), EB-02 (240-166414-6), (LCS 160-565788/1-A), (LCSD 160-565788/2-A) and (MB 160-565788/23-A)

Methods 904.0, 9320: Radium 228 Batch 160-569957: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. JCW-MW-15007 (240-166414-1), JCW-MW-15009 (240-166414-2), JCW-MW-15010 (240-166414-3), JCW-MW-15028 (240-166414-4), DUP-02 (240-166414-5), EB-02 (240-166414-6), (LCS 160-569957/2-A), (LCSD 160-569957/3-A) and (MB 160-569957/1-A)

Methods 904.0, 9320, ST-RC-0058: Total Strontium Batch 160-567639: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Method PrecSep\_0: Radium-228 Prep Batch 160-565793: The following samples were prepared at a reduced aliquot due to Matrix: JCW-MW-15009 (240-166414-2) and DUP-02 (240-166414-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep\_0: The following samples are being re-extracted due to LCS/LCSD failure (low). Original batch 565793. JCW-MW-15007 (240-166414-1), JCW-MW-15009 (240-166414-2), JCW-MW-15010 (240-166414-3), JCW-MW-15028 (240-166414-4), DUP-02 (240-166414-5) and EB-02 (240-166414-6)

Method PrecSep STD: Radium-226 Prep Batch 160-565788. The following samples were prepared at a reduced aliquot due to Matrix: JCW-MW-15009 (240-166414-2) and DUP-02 (240-166414-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Job ID: 240-166414-1

5

4

5

6

a

10

12

13

14

# **Method Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

### **Protocol References:**

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

### Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 240-166414-1

3

4

5

6

0

9

10

11

13

# **Sample Summary**

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR Bottom Ash Pond

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166414-1	JCW-MW-15007	Water	05/10/22 15:40	05/12/22 08:00
240-166414-2	JCW-MW-15009	Water	05/10/22 14:15	05/12/22 08:00
240-166414-3	JCW-MW-15010	Water	05/10/22 12:00	05/12/22 08:00
240-166414-4	JCW-MW-15028	Water	05/10/22 14:50	05/12/22 08:00
240-166414-5	DUP-02	Water	05/10/22 00:00	05/12/22 08:00
240-166414-6	EB-02	Water	05/10/22 15:57	05/12/22 08:00

Job ID: 240-166414-1

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Client Sample ID: JCW-MW-15007

Lab Sample ID: 240-166414-1 Date Collected: 05/10/22 15:40 **Matrix: Water** 

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.09		0.349	0.362	1.00	0.342	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.0		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 - I	Radium-228	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.21		0.371	0.387	1.00	0.421	pCi/L	06/14/22 10:02	06/20/22 14:20	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					06/14/22 10:02	06/20/22 14:20	1
Y Carrier	88.2		40 - 110					06/14/22 10:02	06/20/22 14:20	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radiun	1-228					
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.30		0.509	0.530	5.00	0.421	pCi/L		06/20/22 19:47	1

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Client Sample ID: JCW-MW-15009

Lab Sample ID: 240-166414-2 Date Collected: 05/10/22 14:15 **Matrix: Water** Date Received: 05/12/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.334	U	0.370	0.371	1.00	0.601	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 - I	Radium-228	(GFPC)								
Analysis	Dogult.	Qualifier	Count Uncert.	Total Uncert.	DI.	MDC	l lmi4	Drawarad	Analysed	Dil Foo
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL _	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.11		0.428	0.440	1.00	0.527	pCi/L	06/14/22 10:02	06/20/22 14:20	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.5		40 - 110					06/14/22 10:02	06/20/22 14:20	1
Y Carrier	86.0		40 - 110					06/14/22 10:02	06/20/22 14:20	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.45		0.566	0.576	5.00	0.601	pCi/L		06/20/22 19:47	1

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Client Sample ID: JCW-MW-15010

Lab Sample ID: 240-166414-3 Date Collected: 05/10/22 12:00 **Matrix: Water** 

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0202	U	0.249	0.249	1.00	0.488	pCi/L	05/16/22 12:29	06/09/22 19:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	64.3		40 - 110					05/16/22 12:29	06/09/22 19:39	1

Method: 904.0 - I	Radium-228	(GFPC)								
		,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.932		0.374	0.384	1.00	0.474	pCi/L	06/14/22 10:02	06/20/22 14:20	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		40 - 110					06/14/22 10:02	06/20/22 14:20	1
Y Carrier	86.4		40 - 110					06/14/22 10:02	06/20/22 14:20	1

Method: Ra226_Ra	228 - Con	bined Rad	dium-226 a	nd Radium	<b>-228</b>					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.952		0.449	0.458	5.00	0.488	pCi/L		06/20/22 19:47	1

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Client Sample ID: JCW-MW-15028

Lab Sample ID: 240-166414-4 Date Collected: 05/10/22 14:50 **Matrix: Water** 

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.490		0.274	0.277	1.00	0.357	pCi/L	05/16/22 12:29	06/09/22 19:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110					05/16/22 12:29	06/09/22 19:40	1

Method: 904.0 - I	Radium-228	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.944		0.399	0.408	1.00	0.520	pCi/L	06/14/22 10:02	06/20/22 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					06/14/22 10:02	06/20/22 14:21	1
Y Carrier	85.2		40 - 110					06/14/22 10:02	06/20/22 14:21	1

Method: Ra226_Ra	228 - Con	bined Rad	dium-226 a	nd Radiun	1-228					
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.43		0.484	0.493	5.00	0.520	pCi/L		06/20/22 19:47	1

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Lab Sample ID: 240-166414-5 Client Sample ID: DUP-02 Date Collected: 05/10/22 00:00

**Matrix: Water** 

Method: 903.0 - Ra	adium-226	(GFPC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.138	U	0.235	0.235	1.00	0.415	pCi/L	05/16/22 12:29	06/09/22 21:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	75.8		40 - 110					05/16/22 12:29	06/09/22 21:13	1
Ba Carrier	75.8		40 - 110					05/16/22 12:29	06/09/22 21:13	

Method: 904.0 -	Radium-228	(GFPC)								
		, ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.37		0.640	0.652	1.00	0.892	pCi/L	06/14/22 10:02	06/20/22 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	61.3		40 - 110					06/14/22 10:02	06/20/22 14:21	1
Y Carrier	85.6		40 - 110					06/14/22 10:02	06/20/22 14:21	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.50		0.682	0.693	5.00	0.892	pCi/L		06/20/22 19:47	1

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Client Sample ID: EB-02 Lab Sample ID: 240-166414-6

Date Collected: 05/10/22 15:57 **Matrix: Water** Date Received: 05/12/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0170	U	0.168	0.168	1.00	0.341	pCi/L	05/16/22 12:29	06/09/22 21:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.6		40 - 110					05/16/22 12:29	06/09/22 21:14	1

Method: 904.0 -	Radium-228	(GFPC)								
		` '	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.245	U	0.301	0.302	1.00	0.498	pCi/L	06/14/22 10:02	06/20/22 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					06/14/22 10:02	06/20/22 14:21	1
Y Carrier	85.2		40 - 110					06/14/22 10:02	06/20/22 14:21	1

Method: Ra226_Ra2	28 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.262	U	0.345	0.346	5.00	0.498	pCi/L		06/20/22 19:47	1

# **Tracer/Carrier Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Job ID: 240-166414-1

Method: 903.0 - Radium-226 (GFPC)

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

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166414-1	JCW-MW-15007	96.0	
240-166414-2	JCW-MW-15009	87.0	
240-166414-3	JCW-MW-15010	64.3	
240-166414-4	JCW-MW-15028	88.0	
240-166414-5	DUP-02	75.8	
240-166414-6	EB-02	78.6	
LCS 160-565788/1-A	Lab Control Sample	99.0	
LCSD 160-565788/2-A	Lab Control Sample Dup	96.8	
MB 160-565788/23-A	Method Blank	69.1	
Tracer/Carrier Legend	l		

Method: 904.0 - Radium-228 (GFPC)

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

				Percent Yield (Acceptance Limits)
		Ва	Υ	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-166414-1	JCW-MW-15007	102	88.2	
240-166414-2	JCW-MW-15009	82.5	86.0	
240-166414-3	JCW-MW-15010	92.0	86.4	
240-166414-4	JCW-MW-15028	90.0	85.2	
240-166414-5	DUP-02	61.3	85.6	
240-166414-6	EB-02	93.0	85.2	
LCS 160-569957/2-A	Lab Control Sample	98.3	86.7	
LCSD 160-569957/3-A	Lab Control Sample Dup	95.3	86.7	
MB 160-569957/1-A	Method Blank	101	86.7	

Ba = Ba Carrier

Y = Y Carrier

**Eurofins Canton** 

Client: TRC Environmental Corporation. Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-565788/23-A

Lab Sample ID: LCS 160-565788/1-A

Analysis Batch: 569248

Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Prep Batch: 565788** Count Total

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.03434 U 0.165 0.165 1.00 0.332 pCi/L 05/16/22 12:29 06/09/22 21:14

MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 69.1 40 - 110 05/16/22 12:29 06/09/22 21:14

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Matrix: Water** Analysis Batch: 569248 **Prep Batch: 565788** 

Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL %Rec Limits MDC Unit Radium-226 11.3 9.157 1.21 1.00 0.269 pCi/L 75 - 125

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 99.0 40 - 110

Lab Sample ID: LCSD 160-565788/2-A

**Matrix: Water** 

Y Carrier

**Analysis Batch: 569248** 

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

06/14/22 10:02 06/20/22 14:20

**Prep Batch: 565788** 

Total LCSD LCSD %Rec **RER** Spike Uncert. %Rec Added  $(2\sigma + / -)$ RL **MDC** Unit Limits Analyte Result Qual RER Limit Radium-226 11.3 8.743 1.18 1.00 0.355 pCi/L 75 - 125 0.17

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 96.8 40 - 110

Method: 904.0 - Radium-228 (GFPC)

86.7

Lab Sample ID: MB 160-569957/1-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 570883 Prep Batch: 569957** 

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed Radium-228 -0.07254 Ū 0.235 0.235 1.00 0.461 pCi/L 06/14/22 10:02 06/20/22 14:20

MB MB Carrier %Yield Qualifier Limits Prepared Dil Fac Analyzed Ba Carrier 101 40 - 110 06/14/22 10:02 06/20/22 14:20 40 - 110

**Eurofins Canton** 

### **QC Sample Results**

Client: TRC Environmental Corporation.

Job ID: 240-166414-1

Project/Site: Karn/Weadock CCR Bottom Ash Pond

### Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-569957/2-A Client Sample ID: Lab Control Sample

Matrix: Water

**Analysis Batch: 570883** 

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

Prep Batch: 569957

Total LCS LCS %Rec Spike Uncert. %Rec Analyte Added Result Qual  $(2\sigma + / -)$ RL**MDC** Unit Limits Radium-228 8.52 8.193 1.13 1.00 0.524 pCi/L 75 - 125

LCS LCS

 Carrier
 %Yield 98.3
 Qualifier 40 - 110

 Y Carrier
 86.7
 40 - 110

Lab Sample ID: LCSD 160-569957/3-A Client Sample ID: Lab Control Sample Dup

**Matrix: Water** 

**Analysis Batch: 570883** 

Prep Type: Total/NA

Prep Type: Total/NA Prep Batch: 569957

Total **Spike** LCSD LCSD Uncert. %Rec **RER** %Rec Limit Analyte Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit Limits RER Radium-228 1.00 0.508 pCi/L 8.52 8.363 1.16 98 75 - 125 0.07

LCSD LCSD

 Carrier
 %Yield Ba Carrier
 Qualifier 95.3
 Limits 40 - 110

 Y Carrier
 86.7
 40 - 110

4

11

14

4 /

# **QC Association Summary**

Client: TRC Environmental Corporation. Project/Site: Karn/Weadock CCR Bottom Ash Pond

### **Prep Batch: 565788**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166414-1	JCW-MW-15007	Total/NA	Water	PrecSep STD	
240-166414-2	JCW-MW-15009	Total/NA	Water	PrecSep STD	
240-166414-3	JCW-MW-15010	Total/NA	Water	PrecSep STD	
240-166414-4	JCW-MW-15028	Total/NA	Water	PrecSep STD	
240-166414-5	DUP-02	Total/NA	Water	PrecSep STD	
240-166414-6	EB-02	Total/NA	Water	PrecSep STD	
MB 160-565788/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-565788/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-565788/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

### **Prep Batch: 569957**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166414-1	JCW-MW-15007	Total/NA	Water	PrecSep_0	
240-166414-2	JCW-MW-15009	Total/NA	Water	PrecSep_0	
240-166414-3	JCW-MW-15010	Total/NA	Water	PrecSep_0	
240-166414-4	JCW-MW-15028	Total/NA	Water	PrecSep_0	
240-166414-5	DUP-02	Total/NA	Water	PrecSep_0	
240-166414-6	EB-02	Total/NA	Water	PrecSep_0	
MB 160-569957/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-569957/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-569957/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

Job ID: 240-166414-1

### **Lab Chronicle**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Bottom Ash Pond

Client Sample ID: JCW-MW-15007

Date Collected: 05/10/22 15:40 Date Received: 05/12/22 08:00

Lab Sample ID: 240-166414-1

**Matrix: Water** 

Job ID: 240-166414-1

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569957	06/14/22 10:02	MS	TAL SL
Total/NA	Analysis	904.0		1	570883	06/20/22 14:20	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570890	06/20/22 19:47	EMH	TAL SL

Client Sample ID: JCW-MW-15009

Date Collected: 05/10/22 14:15

Date Received: 05/12/22 08:00

Lab Sample ID: 240-166414-2

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569957	06/14/22 10:02	MS	TAL SL
Total/NA	Analysis	904.0		1	570883	06/20/22 14:20	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570890	06/20/22 19:47	EMH	TAL SL

Client Sample ID: JCW-MW-15010

Date Collected: 05/10/22 12:00 Date Received: 05/12/22 08:00

Lab Sample ID: 240-166414-3

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569248	06/09/22 19:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569957	06/14/22 10:02	MS	TAL SL
Total/NA	Analysis	904.0		1	570883	06/20/22 14:20	CLP	TAL SL
Total/NA	Analysis	Ra226 Ra228		1	570890	06/20/22 19:47	EMH	TAL SL

Client Sample ID: JCW-MW-15028

Date Collected: 05/10/22 14:50

Date Received: 05/12/22 08:00

Lab	Sampl	e ID:	240-1	66414	-4
			Mat	rix: Wa	ter

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569248	06/09/22 19:40	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569957	06/14/22 10:02	MS	TAL SL
Total/NA	Analysis	904.0		1	570883	06/20/22 14:21	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570890	06/20/22 19:47	EMH	TAL SL

**Eurofins Canton** 

6/23/2022

### **Lab Chronicle**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Bottom Ash Pond

**Client Sample ID: DUP-02** 

Date Collected: 05/10/22 00:00 Date Received: 05/12/22 08:00 Lab Sample ID: 240-166414-5

**Matrix: Water** 

Job ID: 240-166414-1

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569248	06/09/22 21:13	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569957	06/14/22 10:02	MS	TAL SL
Total/NA	Analysis	904.0		1	570883	06/20/22 14:21	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570890	06/20/22 19:47	EMH	TAL SL

Client Sample ID: EB-02 Lab Sample ID: 240-166414-6

Date Collected: 05/10/22 15:57

Matrix: Water

Date Received: 05/12/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569248	06/09/22 21:14	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569957	06/14/22 10:02	MS	TAL SL
Total/NA	Analysis	904.0		1	570883	06/20/22 14:21	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570890	06/20/22 19:47	EMH	TAL SL

### **Laboratory References:**

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

2

3

6

8

4.0

<u> 11</u>

13

# **Accreditation/Certification Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Bottom Ash Pond

### **Laboratory: Eurofins St. Louis**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	<b>Identification Number</b>	<b>Expiration Date</b>
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Job ID: 240-166414-1

4

5

7

9

10

12

I S

WI-NC-099

VOA Sample Preservation - Date/Time VOAs Frozen:

		Eurofins - Canto	n Sample Receipt Mu	Itiple Cooler Form	
Cool	er Description	IR Gun #	Observed	Corrected	Coolant
0	(Circle)	(Circle)	Temp °C	Temp °C	(Circle)
CI CI	ent Box Other	IR-13 IR-15	1.8	1.8	Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	1R-1B 1R-15	0.9	0.9	Wet ice Blue ice Dry ice Water None
TA) CI	ent Box Other	IR-13 IR-15	0.8	0.8	Wet ice Blue ice Dry ice
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Stue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA C	ent Box Other	IR-13 IR-15			Wet ice Sive ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	eni Box Other	IR-13 IR-15			Wat Ice Sive Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15		****	Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA C	ent Box Other	IR-13 IR-15			Wet ice Blue Ice Dry Ice Water None
TA CI	ent Sox Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Sox Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	iR-13 iR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA C	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA CI	ent Box Other	IR-13 IR-15			Wet ice Blue Ice Dry ice <u>Water None</u>
TA CE	ent Box Other	IR-13 IR-15			Wet Ice Slue Ice Dry Ice Water None
				☐ See Temp	erature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

5

7

0

10

11

Temperature readings:	<del> </del>		
Client Sample ID	<u>Lab ID</u>	Container Type	Container Preservative  pH Temp Added (mls) Lot #
JCW-MW-15007	240-166414-A-1	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15007	240-166414-B-1	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15008	240-166414-A-2	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15008	240-166414-B-2	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15009	240-166414-A-3	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15009	240-166414-B-3	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15028	240-166414-A-4	Plastic 1 liter - Nitric Acid	<2
JCW-MW-15028	240-166414-B-4	Plastic 1 liter - Nitric Acid	<2
DUP-02	240-166414-A-5	Plastic 1 liter - Nitric Acid	<2 1
DUP-02	240-166414-B-5	Plastic 1 liter - Nitric Acid	<2
EB-02	240-166414-A-6	Plastic 1 liter - Nitric Acid	<2
EB-02	240-166414-B-6	Plastic 1 liter - Nitric Acid	<2 1

13

eurofins Environment Testing America

# **Chain of Custody Record**

180 S. Van Buren Avenue

**Eurofins Canton** 

Phone: 330-497-9396 Fax: 330-497-0772															
Client Information (Sub Contract Lab)	Sampler:			Lab PM: Brooks	Lab PM: Brooks, Kris M	Ę				Сатіег	Camer Tracking No(s)	No(s):		COC No: 240-151953.1	2
Client Contact: Shipping/Receiving	Phone:			E-Mail: Kris.E	3rooks@	et.eurc	E-Mail: Kris.Brooks@et.eurofinsus.com	Ĕ		State o Michig	State of Origin: Michigan			Page: Page 1 of 1	
Combany: TestAmerica Laboratories, Inc.					Accreditati	ons Req	Accreditations Required (See note)	note):						Job #: 240-166414-1	1
Address. 13715 Rider Trail North,	Due Date Requested: 6/13/2022	ij						nalys	is Re	Analysis Requested	P			Preservation Codes	ဗ္ဗီ
City: Earth City	TAT Requested (days):	3ys):			0.			匚	-		-			A - HCL B - NaOH	M - Hexane N - None
State, Zip: MO, 63045														D - Nitric Acid E - NaHSO4	
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	# DO #													F - MeOH G - Amchlor	R - Na2S203 S - H2S04 T - T50 0-4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
Email:	WO#:				(0)									_	
Project Name: Karn/Weadock CCR Groundwater Monitoring	Project #: 24024154				e or p			_						-	W - pH 4-5 Z - other (specify)
Sile	SSOW#:				N as		)d:							Other	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample	Sample Type (C=comp,	Matrix (wwwter, Smooth, Owwaste/oh,	benetilis bioli M/SM motive		8226Ra228_GF							nedmuli lalo	
	X	X	70		X	-									Special Illati uctions/note
JCW-MW-15007 (240-166414-1)	5/10/22	15:40 Fastern		Water		×	×							2 TVA protocol	TVA protocol - Ra-226+228 action limit at
ICW-MW-15009 (240-166414-2)	5/10/22	14:15 Eastern		Water		×	×		-					TVA protocol	TVA protocol - Ra-226+228 action limit at
JCW-MW-15010 (240-166414-3)	5/10/22	12:00 Eastern		Water		×	×							2 TVA protocol	TVA protocol - Ra-226+228 action limit at 5.0 oc.il
JCW-MW-15028 (240-166414-4)	5/10/22	14:50 Eastern		Water		×	×		-					2 TVA protocol	TVA protocol - Ra-226+228 action limit at
DUP-02 (240-166414-5)	5/10/22	Eastern		Water		×	×							TVA protocol	TVA protocol - Ra-226+228 action limit at
EB-02 (240-166414-6)	5/10/22	15:57 Eastern		Water		×	×		$\vdash$					TVA protocol	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
Ď.					_										
2000						_			$\vdash$				- Local III		
						_									

Interpretation of the Control of the Months Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mont Aethod of Shipmen Special Instructions/QC Requirements: Return To Client Time: Primary Deliverable Rank: 2 Deliverable Requested: I, II, III, IV, Other (specify) Possible Hazard Identification Empty Kit Relinquished by:

erson 0880 [.ou.k, Klak Date/Time teceived by: Cooler Temperature(s) °C and Other Remarks: FED EX Received by: Company 944 S-12-22 Date/Time Jate/Time FED EX Custody Seal No.: Custody Seals Intact: inquished by

# **Login Sample Receipt Checklist**

Client: TRC Environmental Corporation.

Job Number: 240-166414-1

Login Number: 166414
List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/13/22 11:49 AM

Creator: Worthington, Sierra M

Creator: worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

6

8

10

10

13



# **Environment Testing America**

# **ANALYTICAL REPORT**

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166150-1

Client Project/Site: CCR Background Well

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/12/2022 7:33:54 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS

Review your project results through

Have a Question?



Visit us at:

www.eurofinsus.com/Env

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

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	13
QC Sample Results	14
QC Association Summary	16
Lab Chronicle	17
Certification Summary	19
Chain of Custody	20
Receipt Checklists	25

4

5

7

8

10

10

13

### **Definitions/Glossary**

Client: TRC Environmental Corporation.

Job ID: 240-166150-1

Project/Site: CCR Background Well

### **Qualifiers**

R	a	d

\* RPD of the LCS and LCSD exceeds the control limits
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

4

6

9

11

13

### **Case Narrative**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Job ID: 240-166150-1

**Laboratory: Eurofins Canton** 

Narrative

Job Narrative 240-166150-1

### Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226\_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

### Receipt

The samples were received on 5/6/2022 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 0.9° C, 1.3° C and 1.4° C.

### **RAD**

Method 903.0: Radium-226 batch 564568

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-15002 (240-166150-1), MW-15008 (240-166150-2), MW-15016 (240-166150-3), MW-15019 (240-166150-4), DUP-04 (240-166150-5), EB-04 (240-166150-6), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

### Method 904.0: Radium-228 batch 564569

The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

### Method 904.0: Radium-228 batch 564569

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-15002 (240-166150-1), MW-15008 (240-166150-2), MW-15016 (240-166150-3), MW-15019 (240-166150-4), DUP-04 (240-166150-5), EB-04 (240-166150-6), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

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

4

4

5

6

0

9

10

12

13

# **Method Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Method 903.0	Method Description Radium-226 (GFPC)	Protocol EPA	TAL SL
904.0	Radium-228 (GFPC) Combined Radium-226 and Radium-228	EPA	TAL SL
Ra226_Ra228		TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth) Preparation, Precipitate Separation	None	TAL SL
PrecSep_0		None	TAL SL

### **Protocol References:**

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

### Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# **Sample Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166150-1	MW-15002	Water	05/02/22 17:24	05/06/22 08:00
240-166150-2	MW-15008	Water	05/02/22 13:45	05/06/22 08:00
240-166150-3	MW-15016	Water	05/03/22 08:37	05/06/22 08:00
240-166150-4	MW-15019	Water	05/02/22 15:20	05/06/22 08:00
240-166150-5	DUP-04	Water	05/02/22 00:00	05/06/22 08:00
240-166150-6	EB-04	Water	05/02/22 13:45	05/06/22 08:00

3

4

J

8

9

10

12

13

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-1

**Matrix: Water** 

Job ID: 240-166150-1

Client Sampl	e ID:	MW-	15002
Data Collected:	05/02	122 47	-24

Analyte	Popult	Qualifier	Count Uncert.	Total Uncert.	RL	MDC	l Init	Prepared	Analvzed	Dil Fac
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	KL _	MIDC	Unit	Prepared	Analyzeu	DII Fac
Radium-226	1.37		0.522	0.536	1.00	0.574	pCi/L	05/10/22 09:51	06/07/22 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					05/10/22 09:51	06/07/22 18:11	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.30	*	0.757	0.816	1.00	0.785	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.7		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium- <mark>226</mark> a	nd Radium	1-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	4.68		0.920	0.976	5.00	0.785	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-2

**Matrix: Water** 

Job ID: 240-166150-1

Date Collected: 05/02/22 13:45 Date Received: 05/06/22 08:00

Client Sample ID: MW-15008

Method: 903.0 -	Radiuiii-220	(GFPC)	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.317	U	0.294	0.295	1.00	0.447	pCi/L	05/10/22 09:51	06/07/22 18:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 09:51	06/07/22 18:35	1

Method: 904.0 -	Radium-228	(GFPC)								
		` '	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.509	U *	0.388	0.391	1.00	0.588	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.4		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.826		0.487	0.490	5.00	0.588	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-3

Job ID: 240-166150-1

**Matrix: Water** 

Cilent	Samp	ie id:	IVI VV -	15016
Date Co	Moctod	· 05/03	/22 NR	-27

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0815	U	0.195	0.195	1.00	0.368	pCi/L	05/10/22 09:51	06/07/22 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					05/10/22 09:51	06/07/22 18:11	1

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.542	U *	0.403	0.406	1.00	0.611	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	84.5		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.624	<del></del> -	0.448	0.450	5.00	0.611	pCi/L	_ · · · · ·	06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-4

Matrix: Water

Job ID: 240-166150-1

Client Sample ID: MW-15019
Date Collected: 05/02/22 15:20
Date Received: 05/06/22 08:00

Method: 903.0 -	Radium-226	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.278	U	0.349	0.350	1.00	0.579	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 09:51	06/07/22 18:05	1

Method: 904.0 - I	Radium-228	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.83	*	0.601	0.625	1.00	0.742	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.7		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radiun	1-228					
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.11		0.695	0.716	5.00	0.742	pCi/L		06/08/22 13:03	1

6/12/2022

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-5

**Matrix: Water** 

Job ID: 240-166150-1

Client Sample ID: DUP-04
Date Collected: 05/02/22 00:00
Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.650		0.422	0.426	1.00	0.599	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					05/10/22 09:51	06/07/22 18:05	1

Method: 904.0 -	Radium-228	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.938	*	0.482	0.490	1.00	0.675	pCi/L	05/10/22 10:04	06/07/22 15:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					05/10/22 10:04	06/07/22 15:34	1
Y Carrier	89.0		40 - 110					05/10/22 10:04	06/07/22 15:34	1

	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.59		0.641	0.649	5.00	0.675	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-6

Job ID: 240-166150-1

**Matrix: Water** 

Client Sample ID: EB-04 Date Collected: 05/02/22 13:45

Method: 903.0 - R	adium-226	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0315	U	0.209	0.209	1.00	0.466	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.6		40 - 110					05/10/22 09:51	06/07/22 18:05	1

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.292	U *	0.488	0.488	1.00	0.832	pCi/L	05/10/22 10:04	06/07/22 15:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.6		40 - 110					05/10/22 10:04	06/07/22 15:35	1
Y Carrier	87.9		40 - 110					05/10/22 10:04	06/07/22 15:35	1

Method: Ra226_Ra2	228 - Con	bined Rad	dium-226 a	nd Radium	<b>-228</b>					
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.260	U	0.531	0.531	5.00	0.832	pCi/L		06/08/22 13:03	1

# **Tracer/Carrier Summary**

Client: TRC Environmental Corporation. Job ID: 240-166150-1 Project/Site: CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

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

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166150-1	MW-15002	82.3	
240-166150-2	MW-15008	89.8	
240-166150-3	MW-15016	93.0	
240-166150-4	MW-15019	89.8	
240-166150-5	DUP-04	88.3	
240-166150-6	EB-04	57.6	
LCS 160-564568/1-A	Lab Control Sample	94.3	
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3	
MB 160-564568/23-A	Method Blank	99.3	
Tracer/Carrier Legend	l		

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)					
		Ва	Υ				
Lab Sample ID	Client Sample ID	(40-110)	(40-110)				
240-166150-1	MW-15002	82.3	86.7				
240-166150-2	MW-15008	89.8	86.4				
240-166150-3	MW-15016	93.0	84.5				
240-166150-4	MW-15019	89.8	86.7				
240-166150-5	DUP-04	88.3	89.0				
240-166150-6	EB-04	57.6	87.9				
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9				
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5				
MB 160-564569/23-A	Method Blank	99.3	91.2				

Ba = Ba Carrier

Y = Y Carrier

**Eurofins Canton** 

Client: TRC Environmental Corporation.

Job ID: 240-166150-1

Project/Site: CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A

Count

Matrix: Water

**Analysis Batch: 569008** 

Client Sample ID: Method Blank

Prep Type: Total/NA
Prep Batch: 564568

**Prep Batch: 564568** 

MB MB Uncert. Uncert. **MDC** Unit Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL Prepared Analyzed Dil Fac Radium-226 0.002143 U 0.135 0.135 1.00 0.285 pCi/L 05/10/22 09:51 06/07/22 20:02

Total

MB MB

 Carrier
 %Yield Ba Carrier
 Qualifier 99.3
 Limits 40-110
 Prepared 05/10/22 09:51
 Analyzed 06/07/22 20:02
 Dil Fac 06/07/22 20:02

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

**Prep Batch: 564568** 

Lab Sample ID: LCS 160-564568/1-A Matrix: Water

Analysis Batch: 568823

Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Radium-226 11.3 9.625 1.28 1.00 0.274 pCi/L 85 75 - 125

LCS LCS

Lab Sample ID: LCSD 160-564568/2-A Client Sample ID: Lab Control Sample Dup

**Matrix: Water** 

**Analysis Batch: 568823** 

Prep Type: Total/NA

Prep Batch: 564568

Total

LCSD LCSD %Rec **RER** Spike Uncert. Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Analyte RER Limit Radium-226 11.3 1.34 1.00 0.405 pCi/L 86 75 - 125 0.03 9.709

LCSD LCSD

 Carrier
 %Yield Ba Carrier
 Qualifier 82.3
 Limits 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A

**Matrix: Water** 

Analysis Batch: 568850

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 564569** 

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed pCi/L Radium-228 0.03881 Ū 0.215 0.215 1.00 05/10/22 10:04 06/07/22 15:38 0.396

MB MB

 Carrier
 %Yield part
 Limits
 Prepared prepared
 Analyzed point part
 Dil Fac part

 Ba Carrier
 99.3
 40 - 110
 05/10/22 10:04
 06/07/22 15:38
 1

 Y Carrier
 91.2
 40 - 110
 05/10/22 10:04
 06/07/22 15:38
 1

**Eurofins Canton** 

2

4

6

7

9

10

12

### **QC Sample Results**

Client: TRC Environmental Corporation. Job ID: 240-166150-1

Project/Site: CCR Background Well

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

LCS LCS

Result Qual

6.624

**Matrix: Water** 

Analysis Batch: 569007

**Prep Batch: 564569** Total %Rec Uncert.  $(2\sigma + / -)$ RL**MDC** Unit %Rec Limits

0.571 pCi/L

LCS LCS %Yield Qualifier Carrier

Limits Ba Carrier 94.3 40 - 110 Y Carrier 84.9 40 - 110

Lab Sample ID: LCSD 160-564569/2-A **Client Sample ID: Lab Control Sample Dup** 

1.00

1.00

**Matrix: Water** 

Analyte

Radium-228

**Analysis Batch: 569007** 

Spike

Added

8.55

Prep Type: Total/NA

**Prep Batch: 564569** 

75 - 125

Total **Spike** LCSD LCSD Uncert. %Rec %Rec Limits Analyte Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit RER Limit Radium-228 9.176 1.00 0.579 pCi/L 8.55 1.28 107 75 - 125 1.12

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 40 - 110 82.3 40 - 110 Y Carrier 84.5

# **QC Association Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well Job ID: 240-166150-1

# Rad

# **Prep Batch: 564568**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166150-1	MW-15002	Total/NA	Water	PrecSep STD	
240-166150-2	MW-15008	Total/NA	Water	PrecSep STD	
240-166150-3	MW-15016	Total/NA	Water	PrecSep STD	
240-166150-4	MW-15019	Total/NA	Water	PrecSep STD	
240-166150-5	DUP-04	Total/NA	Water	PrecSep STD	
240-166150-6	EB-04	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

# Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166150-1	MW-15002	Total/NA	Water	PrecSep_0	
240-166150-2	MW-15008	Total/NA	Water	PrecSep_0	
240-166150-3	MW-15016	Total/NA	Water	PrecSep_0	
240-166150-4	MW-15019	Total/NA	Water	PrecSep_0	
240-166150-5	DUP-04	Total/NA	Water	PrecSep_0	
240-166150-6	EB-04	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

**Eurofins Canton** 

# **Lab Chronicle**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Client Sample ID: MW-15002

Lab Sample ID: 240-166150-1

**Matrix: Water** 

Job ID: 240-166150-1

Date Collected: 05/02/22 17:24 Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:11	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226 Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: MW-15008 Lab Sample ID: 240-166150-2

Date Collected: 05/02/22 13:45 **Matrix: Water** 

Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:35	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-3 Client Sample ID: MW-15016

Date Collected: 05/03/22 08:37 **Matrix: Water** Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:11	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-4 Client Sample ID: MW-15019

Date Collected: 05/02/22 15:20 Date Received: 05/06/22 08:00

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Page 17 of 25

**Eurofins Canton** 

6/12/2022

**Matrix: Water** 

# **Lab Chronicle**

Client: TRC Environmental Corporation.

Job ID: 240-166150-1 Project/Site: CCR Background Well

**Client Sample ID: DUP-04** 

Date Received: 05/06/22 08:00

Lab Sample ID: 240-166150-5 Date Collected: 05/02/22 00:00

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:34	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-6 Client Sample ID: EB-04

Date Collected: 05/02/22 13:45 **Matrix: Water** Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:35	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

**Laboratory References:** 

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# **Accreditation/Certification Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

# **Laboratory: Eurofins St. Louis**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	<b>Identification Number</b>	<b>Expiration Date</b>
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

	Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772		Chain of Custody Record	tody Re	scord	MICHIGAN 190	IGAN 00	💸 eurofins	Environment Testing America
, ,	Client Information	Sampler. Heline.	Cop naviel	1	Lab PM Brooks, Kris M	Сате	Camer Tracking No(s):	COC No. 240-94785-33282	2.1
	Client Contact Jacob Krenz	Phone.		_	E-Mail: Kris.Brooks@et eurofinsus.com		State of Origin:	Page Page 1 of 1	
	Company TRC Environmental Corporation.		PWSID.			Analysis Requested	ted	# qof	
	Address. 1540 Eisenhower Place	Due Date Requested:							
	City Ann Arbor	TAT Requested (days):						B NaOH C Zn Acetate	M - Hexane N - None O - AsNaO2
	State, Zip Mi, 48 108-7080	Compliance Project: A Yes	S A No						P - Na2SO3
	Phone 734-971-7080(Tel) 734-971-9022(Fax)	PO# TBD			(0				R - Na2S2O3 S - H2SO4 T - TSP Dodecahvdrate
	Email JKrenz@trccompanies.com	*OM						I - Ice J - Di Water	U - Acetone V - MCAA
	Project Name.  Karn/Weadock CCR Background Well	Project # 24024154			bC se ou			K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
	Site	SSOW#			45_85 6D (Ye			Other:	
	Sample Identification	Sample Date Time	Sample Type (C=comp,	1	ield Filtered S Perform MS/MS 03.0, RazzeRaz 04.0 - Standard			otal Number c	
		(		Preservation Code:	6 O				Special Instructions/Note:
	MW-15002	5/2/22 1724	_						
20 (	MW-15008	1 - 7		Water	X				
	MW-15016	5/3/12 837		Water	X				
	MW-15019	1,7,7	-	Water	スススラミ				
	DUP-04	14/12	S	Water	XXX				
	EB-04	5/2/22 134	5	Water	XXX				
		, , ,		Water					
						240-166156	240-166150 Chain of Custody		
		Daison a mosing			Sample Disp	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	assessed if samples are ret	etained longer than 1	month)
					Special Instru	Requiren		0.000	WOTHERS
	Empty Kit Relinquished by	Date			je.		Method of Shipment		
	Reinquished by HQWV, JC N. 1.2. M. Reinquished by	(3/2	009/	Company	Received by	1. C. 12.	Date/Time		Company 7.6.C.
6/12/	Relinquished by	2 13	o	Y AT THE STATE OF	Receiped by		515/23 Date/Time	1380	Company
2022	Custodý Seals Infact: Custody Seal No.				29bler Ten	Cobier Temperature(s) °C and Other Remarks.	1	ıl ı	
,									Ver. 06/08/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative	Login # : 166150
Canton Facility	
Client Site Name	Cooler unpacked by:
Cooler Received on 56.22 Opened on 5-6-22	One)
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier	Other
Receipt After-hours: Drop-off Date/Time Storage Location	
TestAmerica Cooler # 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  See Multiple Cooler For	994
IR GUN# IR-13 (CF 0.0 °C) Observed Cooler Temp. C Corrected Cooler Te	emp. °C
IR GUN #IR-15 (CF -0.7°C) Observed Cooler Temp. °C Corrected Cooler T	
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity/ec. Yes	) No
	No NA lests that are not
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes	checked for pH by Receiving:
	No NA
	VOAs
4. Did custody papers accompany the sample(s)?	
5. Were the custody papers relinquished & signed in the appropriate place?	)No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	No
7. Did all bottles arrive in good condition (Unbroken)?  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 sar	
10. Were correct bottle(s) used for the test(s) indicated?	
11. Sufficient quantity received to perform indicated analyses?	
12. Are these work share samples and all listed on the COC?  Yes	
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	No NA pH Strip Lot# HC157842
	No
	No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #Yes	
17. Was a LL Hg or Me Hg trip blank present? Yes	(NO)
Contacted PM by via Verbal Vo	pice Mail Other
Concerning	
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES  additional next page	Samples processed by:
Containers for Duf-04 and EB-04 are labeled	l as
Dup-Backgound and EB-Backgound. De	tes and times
match COC. Samples are logged per the COC.	TWO 5-6-27
19. SAMPLE CONDITION	
Sample(s) were received after the recommended holding	g time had expired
	n a broken container.
Sample(s) were received with bubble >6 mm in	
20. SAMPLE PRESERVATION	
Sample(s) were furth	ner preserved in the laboratory.
Sample(s) were furth Time preserved: Preservative(s) added/Lot number(s):	
VOA Sample Preservation - Date/Time VOAs Frozen:	

Login #: 166150

	Eurofino Conto	n Comple Descint Ma	Minle Cooler Form	
Cooler Deceription		on Sample Receipt Mu		Coolont
Cooler Description (Circle)	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
Client Box Other	UP-13 IR-15	1,3	1.3	Wet Ice Blue Ice Dry Ice
	(IR-13   IR-15			Water None Wet ic Blue ice Dry ice
TA Client Box Other	(R-13) (R-15	1.4	1.4	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other		0.9	0.9	Water None
TA Client Box Other	HR-13 IR-15			Wet ice Sive ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Bive Ice Dry Ice Water None
1A Client Box Other	(R-13 ∤R-15			Wet Ice Sive Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15		-	Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	iR-13 iR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other			· · · · · · · · · · · · · · · · · · ·	Water None
TA Client Box Other	IR-13 IR-15		****	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Sive Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other	(R-13   IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet ice Blue ice Dry ice
	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None
TA Client Box Other				Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
Cadin Box Oillei			☐ See Tem	perature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

3

6

8

9

10 4 a

12

1 1

EB-04

# **Login Container Summary Report**

240-166150

Temperature readings: \_ Container Preservative Container Type Client Sample ID Lab ID Temp Added (mls) Lot # <u>pH</u> Plastic 1 liter - Nitric Acid MW-15002 240-166150-A-1 <2 Plastic 1 liter - Nitric Acid MW-15002 240-166150-B-1 <2 MW-15008 240-166150-A-2 Plastic 1 liter - Nitric Acid <2 MW-15008 240-166150-B-2 Plastic 1 liter - Nitric Acid <2 MW-15016 240-166150-A-3 Plastic 1 liter - Nitric Acid <2 MW-15016 240-166150-B-3 Plastic 1 liter - Nitric Acid <2 Plastic 1 liter - Nitric Acid MW-15019 240-166150-A-4 <2 MW-15019 240-166150-B-4 Plastic 1 liter - Nitric Acid <2 DUP-04 240-166150-A-5 Plastic 1 liter - Nitric Acid <2 DUP-04 240-166150-B-5 Plastic 1 liter - Nitric Acid <2 EB-04 240-166150-A-6 Plastic 1 liter - Nitric Acid <2

Plastic 1 liter - Nitric Acid

<2

240-166150-B-6

13

Environment Testing America

# **Chain of Custody Record**

Eurofins Canton
180 S. Van Buren Avenue
Barberton. OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

💸 eurofins

	Sampler			Lab PM:					Carrier	Carrier Tracking No(s)		COC No	
Client Information (Sub Contract Lab)				Brooks, Kris M	Kris A	_				e e		240-151693.1	
Cuent Contact: Shipping/Receiving	Phone			E-Mail: Kris.Brooks@et.eurofinsus.com	ooks@	et.eu	nsuijo.	S.COM	State of Origin: Michigan	Origin: <b>an</b>		Page: Page 1 of 1	
Company: TestAmerica Laboratories, Inc.				A	creditati	ons Re	dnired (	Accreditations Required (See note):				Job #: 240-166150-1	
Address: 13715 Birler Trail North	Due Date Requested	ij				l		Signal &				Preservation Codes	odes:
City	TAT Requested (days):	IVS):		T	ì	ŀ	F	Allanysis	Arialysis Requested	  -  -	-	A - HCL	
Earth City				esett.								B - NaOH C - Zn Acetate	
State, Zip: ,MO, 63045										_		D - Nitric Acid E - NaHSO4	
Phone. 314-298-8566(Tel) 314-298-8757(Fax)	PO #:											F - MeOH G - Amchlor	R - Na2S203 S - H2SO4
Émail	:# OM			ON 30	(0)								
Project Name: CCR Background Well	Project #: 24024154				A 10 80						monici	K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
Site	SSOW#:			elamas	SD (Ye						,000 30	Other:	
Sample Identification - Client ID (Lab ID)	Sample Date	Sample	Sample Type (C=comp, G=grab) BT	Matrix (Wewater Sagold, Orweste/oll, Helenaue, ArAlr)	M\&M mohe9	903.0/PrecSep_9 904.0/PrecSep_0	Fa226Ra228_GF				TedmuM latoT		Special Instructions/Note:
	X	X	4 66	on Code:		-	-						
MW-15002 (240-166150-1)	5/2/22	17:24 Eastern		Water		×	×				-	2 TVA protocol - R	TVA protocol - Ra-226+228 action limit at 5.0 p.Ci/l
MW-15008 (240-166150-2)	5/2/22	13:45 Eastern		Water		×	×					2 TVA protocol - R	TVA protocol - Ra-226+228 action limit at 5.0 p.Ci/l
MW-15016 (240-166150-3)	5/3/22	08:37 Eastern		Water		×	×					2 TVA protocol - R 5.0 oCi/L	TVA protocol - Ra-226+228 action limit at 5.0 oCi/L.
MW-15019 (240-166150-4)	5/2/22	15:20 Eastern		Water		×	×					2 TVA protocol - R 5.0 pCi/L	TVA protocol - Ra-226+228 action limit at 5.0 oCi/L.
DUP-04 (240-166150-5)	5/2/22	Eastern		Water		×	×				.,	2 TVA protocol - R 5.0 pCi/L	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
EB-04 (240-166150-6)	5/2/22	13:45 Eastern		Water		×	×				.,	2 TVA protocol - R 5.0 pCi/L	TVA protocol - Ra-226+228 action limit at 5.0 p.Ci/L.
Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central. LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratory or other instructions will be provided. Any changes to laboratory or other instructions will be provided. Any changes to accreditation in the State of Origin listed above for analysis/lests/matrix being analyzed. The samples must be shipped back to the 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 complicance to Eurofins Environment Testing North Central. LLC.	Int Testing North Centra bove for analysis/tests/intral, LLC attention imr	II, LLC places ti matrix being ar mediately. If all	ne ownership of ralyzed, the sam requested accre	method, analyte ples must be shi editations are cu	& accretoped barrent to c	ditation ck to th late, rel	complia e Eurofii um the	nce upon out sub s Environment 1 signed Chain of (	contract laboral esting North Ce Sustody attesting	lories. This sami intral, LLC labora g to said complic	l l ple shipmen ttory or othe ance to Eur	It is forwarded under or instructions will be poolins Environment Te	chain-of-custody. If the rrovided. Any changes to sting North Central, LLC.
Possible Hazard Identification					Sam	le Di	sposa	( A fee may	be assesse	d if samples	are retail	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	1 month)
Unconfirmed						  Retu	Return To Client	Slient [	☐ Disposal By Lab	By Lab		Archive For	Months
Deliverable Requested: I, II, III, IV. Other (specify)	Primary Deliverable Rank: 2	ible Rank: 2			Speci	al Inst	ruction	Special Instructions/QC Requirements:	ments:				
Empty Kit Relinquished by:		Date:		-	Time:	ı			Mel	Method of Shipment:			
Replication by	Date/Time: 5-6-22		14280	Company	<u>~</u>	Received by	by:	FED EX	ង	Date/Time	ле:		Company
Relinquished by FED EX	Date/Time:		<u>o</u>	Company	A.	Received by:	by:	11 Jack	1 ) with : . It	Mak Vime 0	6 0,	2022 0835	Company
ı	Date/Time:		<u>o</u>	Company	Re	Received by:	<b>6</b> /2			Date/Time	.e.		
Custody Seals Intact: Custody Seal No.: △ Yes △ No					ŏ	oler Te	mperat	Cooler Temperature(s) °C and Other Remarks:	er Remarks:				
						14	13	12	10	9	7	5 6	Ver: 06/08/2021
				I		1	3	2	)				

# **Login Sample Receipt Checklist**

Client: TRC Environmental Corporation.

Job Number: 240-166150-1

SDG Number:

Login Number: 166150
List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/09/22 02:40 PM

Creator: Worthington, Sierra M

Creator: worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	

Eurofins Canton
Page 25 of 25



# 2022 Semiannual Groundwater Monitoring Report and Second Quarter 2022 Hydrogeological Monitoring Report

JC Weadock Solid Waste Disposal Area

Essexville, Michigan

July 2022

Darby Litz /

Project Manager/Hydrogeologist

# **Prepared For:**

Consumers Energy 1945 W. Parnall Road Jackson, MI 49201

# Prepared By:

TRC 1540 Eisenhower Place Ann Arbor, Michigan 48108

Kristin Lowery, E.I.T. Project Engineer



# **TABLE OF CONTENTS**

1.0	Intro	oductio	on	1
	1.1	State	ment of Adherence to Approved Hydrogeological Monitoring Plan	1
	1.2	Progr	ram Summary	1
	1.3	Site C	Overview	3
	1.4	Geolo	ogy/Hydrogeology	3
2.0	Lead	chate N	Monitoring	5
3.0	Gro	undwa	ter Monitoring	6
	3.1	Monit	toring Well Network	6
	3.2	May 2	2022 Monitoring Event	7
		3.2.1	Data Quality Review	8
	3.3	Grou	ndwater Flow Rate and Direction	8
	3.4	Grou	ndwater Analytical Data and Relevant Screening Criteria	9
		3.4.1		
		3.4.2	Detection Monitoring	10
		3.4.3	Assessment Monitoring Data Evaluation	11
			3.4.3.1 Establishing Groundwater Protection Standards	12
			3.4.3.2 Data Comparison to Groundwater Protection Standards	12
		3.4.4	GSI Compliance Monitoring	13
	3.5	Alterr	nate Source Demonstration	14
		3.5.1	Monitoring Well JCW-MW-18001: Sulfate and TDS	14
		3.5.2	Monitoring Well MW-55: Arsenic and Molybdenum	14
		3.5.3	Chloride at MW-54R	15
4.0	Con	clusio	ns and Recommendations	16
5.0	Refe	erences	s	17
TAE	BLES			
Tabl	e 1	Su	ımmary of Groundwater Elevation Data: May 2022	
Tabl	e 2		ummary of Groundwater Sampling Results (Analytical): May 2022; JC volid Waste Disposal Area	Weadock
Tabl	e 3	Su	ummary of Groundwater Sampling Results (Analytical): May 2022; Bac ells	kground
Tabl			ummary of Field Parameters: May 2022	
Tabl			ummary of Confidence Interval Evaluation: May 2022 GLE Exceedance Summary Table	
Tabl	<del>c</del> o	(	JLE EXCECUANCE SUMMALY TABLE	



#### **FIGURES**

Figure 1 Site Location Map

Figure 2 Site Map

Figure 3 Potentiometric Surface Map – May 2022

#### **APPENDICES**

Appendix A Static Water Level Evaluation

Appendix B Data Quality Review

Appendix C Detection Monitoring Statistical Trend Tests

Appendix D Assessment Monitoring and GSI Statistical Evaluation

Appendix E Laboratory Analytical Report

Appendix F Field Records

Appendix G Alternate Source Demonstration Supporting Information



# 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 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). 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, 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 2022 JC Weadock Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring 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 approved 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 2022 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 the 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 in order 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:

2



- 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, 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, was 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 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 under this revised plan 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. The Weadock Landfill HMP includes laboratory leachate testing, which consists of four dry-handled Coal Combustion Residual (CCR) samples collected under normal plant operating conditions during the active life of the landfill.

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<sup>1</sup> 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.

Laboratory leachate data was not collected during the second guarter.

5

<sup>&</sup>lt;sup>1</sup> Leachate headwell LH-103 was decommissioned in March 2022 due to damage noted in Q4 2021. LH-103R was installed in March 2022. Well decommissioning and installation records were provided as Appendix H of the *First Quarter 2022 Hydrogeological Monitoring Report* (TRC, 2022).



# 3.0 Groundwater Monitoring

# 3.1 Monitoring Well Network

The groundwater monitoring system presented in the HMP has been established in accordance with R 299.4906 and the CCR Rule §257.91, and consists of 16 monitoring wells (four background monitoring wells and 12 downgradient monitoring wells) 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 will 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 (11) 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-18005JCW-MW-18006MW-20OW-51

■ OW-53 ■ OW-54 ■ OW-55 ■ OW-56R

■ OW-57R IN ■ OW-61 ■ OW-63

#### 3.2 May 2022 Monitoring Event

In accordance with the Weadock Landfill HMP, TRC conducted the second quarter 2022 monitoring event for the Weadock Landfill on May 2 through 10, 2022. Groundwater monitoring was performed in accordance with the Weadock Landfill HMP. 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 St Louis Missouri. Semiannual monitoring constituents include:

Section 11511a(3)(c) – Detection Monitoring Constituents	Section 11519b(2) – As Constit	_
Boron	Antimony	Lithium
Calcium	Arsenic	Mercury
Chloride	Barium	Molybdenum
Fluoride	Beryllium	Nickel
Iron	Cadmium	Selenium
рН	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 second quarter 2022 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 one field blank, one equipment blank, two field duplicates (JCW-MW-18006 and MW-50), and field matrix spike/matrix spike duplicate samples collected at 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 initiated 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 quarterly 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 2022 are generally within the range of 578 to 593 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 MW-50, MW-51, MW-52, MW-53, MW-53R, 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 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. The groundwater monitoring system is structured such that there are eleven (11) 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. 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 A-2 of Appendix A.

#### 3.4 Groundwater Analytical Data and Relevant Screening Criteria

Groundwater analytical data are evaluated in accordance with the Weadock Landfill HMP for the purposes of solid waste license compliance as well as to determine compliance with applicable generic GSI and site-specific GSI mixing zone-based criteria. Data are evaluated by using a combination of screening against relevant criteria, as well as utilizing statistical analyses.

Analytical results from the second quarter 2022 monitoring event are included in the attached laboratory report (Appendix E). Groundwater analytical data from the second quarter 2022 monitoring event are summarized in Table 2 (Weadock Landfill Monitoring Wells) and Table 3 (background monitoring wells), as well as the associated Part 201 generic GSI and site-specific mixing-zone GSI criteria. Field data are summarized in Table 4. During the sampling event, field staff noted that the dissolved oxygen sensor on the water quality meter used to sample the Weadock Landfill downgradient wells was not functioning. Therefore, dissolved oxygen was not measured for the Weadock Landfill wells during the second quarter 2022 sampling event.

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 3.4.4 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 GSI criteria (within the last four quarters) are included.

#### 3.4.1 Groundwater Monitoring Analytical Results

Groundwater monitoring is being conducted under Weadock Landfill HMP. Downgradient groundwater quality is evaluated using sample results from historic wells (MW-50, MW-51, MW-52, MW-53, MW-53R, MW-54R, and MW-55) along with wells that were newly installed in 2018 (OW-57R OUT, JCW-MW-18001, JCW-MW-18004, JCW-MW-18005, and JCW-MW-18006). Data for these wells are tabulated in Table 2. 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 GWPSs for the landfill. Data for these wells are tabulated in Table 3.

Analytical results for these wells are being evaluated 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 3.4.2 Detection Monitoring and Section 3.4.3 Assessment Monitoring). Additionally, analytical results for these wells are being evaluated in support of GSI compliance. GSI criteria only apply to the designated compliance point as specified in Section 3.4.4 below; however, analytical results and data trends in groundwater collected from the perimeter dike wells are evaluated to identify potential GSI compliance issues.

#### 3.4.2 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.

Analytical data for the detection monitoring program are tabulated in Table 2. In addition to the comparison of analytical data to relevant screening criteria, 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 slope was statistically significant.

Appendix C includes a table summarizing the results of the trend tests as well as the Sanitas<sup>™</sup> output summary statistics and graphs. Data are stable or declining for the majority of the



well/constituent pairs, with the following exceptions:

- The previously observed increasing trend for boron at MW-54R has continued to be observed in second quarter 2022.
- The increasing trends initially observed for boron at MW-51 and OW-57R Out in first quarter 2022 were confirmed in the second quarter 2022.
- The previously confirmed increasing trend for boron at MW-55 in the first quarter 2022 did not continue to increase in second quarter 2022.
- The new increasing trends for boron that were observed at MW-50, MW-53, and MW-53R in first quarter 2022 were not confirmed in second quarter 2022.
- The increasing trend initially observed for chloride at MW-54R in first quarter 2022 was confirmed in the second quarter 2022.
- A continuous increasing trend was observed for sulfate at JCW-MW-18001. Sulfate concentrations remain below the generic final acute value (FAV).
- The increasing trend initially observed for total dissolved solids (TDS) at JCW-MW-18001 in first guarter 2022 was confirmed in the second guarter 2022.

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, chloride, sulfate, and TDS, 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. Sulfate concentrations are related to redox conditions and the increasing trend of sulfate is attributed to localized changes in geochemistry near JCW-MW-18001, rather than a change in flux from the landfill, as discussed further in Section 3.5.

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 at SSI 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 3.4.3.2. Continued monitoring and assessment for potential future actions is warranted at this time; however, observed concentrations of boron in each of the monitoring wells is less than the relevant Part 115 compliance standard - the GSI pathway standard (Section 3.4.4).

#### 3.4.3 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 C (Assessment Monitoring and GSI Statistical Evaluation of the May 2022 Sampling Event). A summary of the confidence interval evaluation is provided in Table 5.

#### 3.4.3.1 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, April 2021). 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.

#### 3.4.3.2 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 2022 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 were present at statistically significant levels above the GWPS. The GWPS for boron was 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. Concentrations of boron below relevant GSI criteria, as discussed in Section 3.4.4.

Assessment Monitoring Constituents (Part 115 and Federal CCR): Based on the second quarter 2022 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 8.67 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.



# 3.4.4 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 2022 data from the GSI monitoring points are tabulated in Table 2. 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 (Assessment Monitoring and GSI Statistical Evaluation of the May 2022 Sampling Event). 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. 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). The May 2022 sampling event results show that 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 and molybdenum data over the past 8 events did not exceed the GSI criteria. 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: Table A1).



#### 3.5 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed in the 2021 Semiannual Groundwater Monitoring Report and Fourth Quarter 2021 Hydrogeological Monitoring Report (TRC, January 2022):

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

The ASD has been updated this quarter to include:

- TDS in monitoring well JCW-MW-18001; and
- Chloride in monitoring well MW-54R.

# 3.5.1 Monitoring Well JCW-MW-18001: Sulfate and TDS

Although confirmed increasing trends were observed at JCW-MW-18001 for sulfate and TDS (through Q2 2022), the potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill (Appendix A) and these trends are not indicative of a new release from the landfill. Increases of 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 presenting an Alternate Source Demonstration for these constituents. Additional time series charts are included in Appendix G to illustrate the correlation between the increased concentrations and the changing water levels.

- Sulfate is one of several constituents that contribute to the overall TDS concentration.
   Increasing sulfate concentrations would result in an increase in TDS as well.
- Dissolved oxygen at JCW-MW-18001 is currently higher than what was observed from 2018 to 2019 (Figure G1). Sulfate is used as an oxidizing agent when oxygen is not present. As groundwater is transitioning to a more oxygenated state from the rising adjacent surface water level, less sulfate is being reduced as an electron acceptor, causing increasing concentrations (i.e. less sulfate is being reduced to sulfide/sulfite/elemental sulfur, so the amount of sulfate present increases). Surface water and groundwater levels are now decreasing; however, it may take time for the local geochemistry to re-equilibrate to lowered water levels and dissolved oxygen remains elevated compared to prior years.
- Sulfate concentrations at JCW-MW-18001 (752 mg/L) are much higher than sulfate concentrations previously observed on the inside of the slurry wall at JCW-OW-18001 (86.8 mg/L in second quarter 2021), which further supports that the landfill is not the source of sulfate.

# 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, Table G2 shows concentrations of arsenic, boron, and molybdenum within the landfill (OW-55, JCW-OW-18004 and LH-104) are noticeably different than arsenic and molybdenum concentrations observed in MW-55. Arsenic and molybdenum concentrations are generally much lower inside the slurry wall and boron concentrations are much higher.
- Conservative Tracer Boron is a metalloid known to be present in coal ash and can be used as a conservative tracer in groundwater. Concentrations of boron in Leachate Headwell LH-104 are significantly higher than concentrations observed at any of the other location sampled as a part of this ASD. Additionally, boron concentrations at MW-55 have decreased since 2010 and have been relatively stable, as evidenced by the time series plots in Figure G2. Stable or decreasing concentrations of boron is 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 for MW-55, as shown in Appendices A and G, are increased over 4-ft since 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.

#### 3.5.3 Chloride at MW-54R

An observation of an increasing trend of chloride at MW-54R without other corroborating lines of evidence is not indicative of a release from the Landfill. The potentiometric analysis demonstrates that the slurry wall is effective in reducing the flux of groundwater from the landfill. Furthermore, arsenic is present in CCR material managed at this site and was detected at 87 ug/L in leachate headwell LH-103R in March 2022. Arsenic can be used as a tracer to indicate whether the slurry wall is functioning as designed. If groundwater inside the landfill was adversely affecting groundwater on the outside of the slurry wall, arsenic would be expected to be present at concentrations above background levels (21 ug/L). Arsenic was not detected in the groundwater sample collected at MW-54R in May 2022 and arsenic has historically not been observed at this location at concentrations greater than 4 ug/L. Changes in chloride at MW-54R are likely a result of localized geochemical changes influenced by changes in lake levels. Additionally, chloride was identified as naturally elevated in the Phase II Discharge Evaluation (NRT, September 2005) and was eliminated as a constituent of concern when the mixing zone was first authorized based on the data supporting that conclusion. The box and whiskers plot in Appendix G further illustrates that the chloride concentrations observed at MW-54R are within the range of concentrations observed regionally within other wells in the compliance well network and well below the chloride concentration observed at leachate headwell LH-103R in March 2022.



#### 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 2022 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 *2021 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 2022 data in accordance with the Weadock Landfill HMP demonstrate that boron is present at concentrations above the GWPS. Boron is a detection monitoring (i.e., Appendix III) constituent that does 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. Concentrations of boron are below relevant GSI criteria, as discussed in Section 3.4.4.

The statistical evaluation in second quarter 2022 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 third quarter monitoring event for is scheduled for July 2022.



#### 5.0 References

- AECOM. November 6, 2009. Potential Failure Mode Analysis (PFMA) Report. JC Weadock Electric Generation Facility Ash Dike Risk Assessment Essexville, Michigan. Prepared for Consumers Energy Company
- Consumers Energy Company. 2015. *Hydrogeological Monitoring Plan Rev. 2: JC Weadock Solid Waste Disposal Area.* June 9.
- Consumers Energy. 2019. JC Weadock Landfill Response Action Plan Submittal, JC Weadock Generating Facility (WDS# 395457), Essexville, Michigan. March 15.
- Golder Associates, Inc. 2018. J.C. Weadock Generating Facility, Slurry Wall Vent Closure Construction Documentation Report. October 30.
- Michigan Department of Natural Resources (MDNR). 1986. *Determination of Permit Exemption No. GWE-0005*. August 25.
- Michigan Department of Environmental Quality (MDEQ). 2015. *Implementation of a Mixing Zone Request Consumers Energy DE Karn/JC Weadock Complex*. December 23.
- MDEQ. 2018. Slurry Wall Construction Certification; JC Weadock Landfill, Bay County, Michigan, Waste Data System Number 395457. December 19.
- Michigan Department of Environment, Great Lakes, and Energy (EGLE). 2020. Closure Certification, Consumers Weadock Complex (Weadock) Bottom Ash Pond, Bay County, Waste Data System No. 395457. November 30. [Letter]
- Natural Resource Technology. 2005. Phase II Groundwater Discharge Evaluation, Final Report.
- Natural Resource Technology. 2010. Revised Hydrogeological Monitoring Plan JC Weadock Solid Waste Disposal Area. TRC. 2018. Annual Groundwater Monitoring Report JC Weadock Power Plant, Landfill CCR Unit. Prepared for Consumers Energy Company. January.
- TRC. 2018. Annual Groundwater Monitoring Report JC Weadock Power Plant, Landfill CCR Unit. Prepared for Consumers Energy Company.
- TRC. 2019a. 2018 Annual Groundwater Monitoring Report JC Weadock Power Plant Landfill CCR Unit. Prepared for Consumers Energy Company. January.
- TRC. 2019b. Assessment of Corrective Measures JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Units. Prepared for Consumers Energy Company. September.
- TRC. 2020. 2019 Annual Groundwater Monitoring Report JC Weadock Power Plant Landfill CCR Unit. Prepared for Consumers Energy Company. January.



- TRC. 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residuals (CCR) Units. Prepared for Consumers Energy Company. January.
- TRC. 2021. Landfill Hydrogeological Monitoring Plan JC Weadock Power Plant, Essexville, Michigan. Prepared for Consumers Energy Company. February.
- TRC. 2021. First Quarter 2021 Hydrogeological Monitoring Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan. Prepared for Consumers Energy Company. April.
- USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.
- USEPA. 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 80 Federal Register 74 (April 17, 2015), pp. 21301-21501 (80 FR 21301). April
- USEPA. 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435). July.



# Summary of Groundwater Elevation Data: May 2022 Second Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

	тос		Screen Interval	Мау	2, 2022
Well Location	Elevation (ft)	Geologic Unit of Screen Interval	Elevation (ft)	Depth to Water	Groundwater Elevation
				(ft BTOC)	(ft)
Background Monitori	ng Wells		<del>'</del>		•
MW-15002	587.71	Sand	580.9 to 570.9	6.61	581.10
MW-15008	585.36	Sand with clay	578.7 to 568.7	4.38	580.98
MW-15016	586.49	Sand	581.2 to 578.2	3.66	582.83
MW-15019	586.17	Sand and Sand/Clay	579.5 to 569.5	5.31	580.86
Bottom Ash Pond: Do	owngradient Monito	oring Wells			•
JCW-MW-15007	587.40	Sand	582.7 to 579.2	3.43	583.97
JCW-MW-15009	589.64	Sand	581.9 to 576.9	8.70	580.94
JCW-MW-15010	597.76	Sand	579.7 to 578.2	17.25	580.51
JCW-MW-15028	589.64	Sand	567.7 to 564.7	7.28	582.36
Landfill: Downgradie	nt Monitoring Wells	(outside slurry wall)	•		
JCW-MW-18001	596.73	Sand and Sandy Clay	578.3 to 573.3	16.78	579.95
JCW-MW-18004	593.04	Sandy Clay	583.9 to 578.9	12.28	580.76
JCW-MW-18005	590.89	Sand and Sandy Clay	580.0 to 575.0	8.33	582.56
JCW-MW-18006	600.72	Fly Ash and Sandy Clay	582.8 to 577.8	12.91	587.81
MW-50	593.36	Sand	577.8 to 574.8	13.49	579.87
MW-51	594.29	Sand and Clay	577.8 to 574.8	14.33	579.96
MW-52	594.90	Sand	579.3 to 576.3	14.13	580.77
MW-53	593.68	Sand and Clay	579.1 to 576.1	13.72	579.96
MW-53R	594.25	Sand and Clay	580.4 to 575.4	14.23	580.02
MW-54R	593.89	Clay and Sand	581.3 to 576.3	13.80	580.09
MW-55	593.82	Sand	581.5 to 578.5	14.00	579.82
OW-57ROUT	591.00	Sandy Clay	577.0 to 572.0	10.18	580.82
Landfill: Static Water	Level Only (inside				
JCW-OW-18001	595.84	Fly Ash and Sand	581.1 to 576.1	17.08	578.76
JCW-OW-18002	593.63	Sand	578.9 to 573.9	10.94	582.69
JCW-OW-18003	593.99	Sand and Clay	580.5 to 575.5	8.55	585.44
JCW-OW-18004	594.19	Sandy Clay	584.6 to 579.6	6.27	587.92
JCW-OW-18006	600.61	Fly Ash and Clay with Sand	582.9 to 577.9	9.20	591.41
MW-20	592.73	NR	~581.1 to ~578.1	6.53	586.20
OW-51	593.62	Clay and Sand	578.9 to 575.9	10.08	583.54
OW-53	593.64	Clay and Sand	579.0 to 576.0	7.58	586.06
OW-54	594.10	Clay and Sand	580.0 to 577.0	6.81	587.29
OW-55	594.67	Clay (or Sand and Clay)	580.9 to 577.9	6.18	588.49
OW-56R	592.01	Ash and Sand	577.5 to 572.5	5.95	586.06
OW-57R IN	590.86	Sandy Clay	575.7 to 570.7	6.08	584.78
OW-61	602.15	Ash and Sand	588.0 to 585.0	9.66	592.49
OW-63	612.53	Ash and Sand	594.2 to 591.2	NM	NM
Landfill: Leachate He	adwells	1			
LH-103R	612.70	Fly Ash	30.2 to 33.2	23.58	589.12
LH-104	596.56	Fly Ash	8.0 to 11.0	7.48	589.08

#### 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 NM: Not Measured

# Summary of Groundwater Sampling Results (Analytical): May 2022 Second Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

							Sample Location:	JCW-MW-18001	JCW-MW-18004	JCW-MW-18005	JCW-MW-18006	MW-50	MW-51
							Sample Date:	5/9/2022	5/10/2022	5/10/2022	5/9/2022	5/9/2022	5/9/2022
						Chronic-Based	Acute-Based						
				MI Non-		Mixing Zone GSI	Mixing Zone GSI	Downgradient	Downgradient/	Downgradient	Downgradient	Downgradient/	Downgradient/
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^	Criteria^	Criteria^		GSI		g	GSI	GSI
Appendix III <sup>(1)</sup>	•												
Boron	ug/L	NC	500	500	4,000	44,000	69,000	1,560	226	1,010	2,990	1,360	1,350
Calcium	mg/L	NC	NC	NC	500EE	NC	NC	335	235	280	136	169	247
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	50	NC	NC	58.8	10.8	32.6	67.3	53.3	92.8
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 <sup>E</sup>	250 <sup>E</sup>	500EE	NC	NC	752	512	437	32.8	285	420
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	NC	NC	1,970	1,290	1,330	788	1,020	1,510
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	NC	NC	7.0	6.8	6.8	7.0	7.2	7.2
Appendix IV <sup>(1)</sup>													
Antimony	ug/L	6	6.0	6.0	2	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	100	680	< 1	< 1	5	22	1	10
Barium	ug/L	2,000	2,000	2,000	1,200	NC	NC	80	26	110	514	86	150
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	2	< 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	76	42	33	56	69	56
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	6	6	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	NC	NC	< 0.327	< 0.417	< 0.414	< 0.416	< 0.310	< 0.423
Radium-228	pCi/L	NC	NC	NC	NC	NC	NC	0.494	0.790	< 0.521	< 0.518	< 0.493	< 0.494
Radium-226/228	pCi/L	NC	NC	NC	NC	NC	NC	0.586	0.910	0.622	0.690	0.518	0.576
Selenium	ug/L	50	50	50	5.0	55	120	2	2	2	< 1	2	2
Thallium	ug/L	2	2.0	2.0	2.0	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 11	5 <sup>(2)</sup>												
Iron	ug/L	300**	300 <sup>E</sup>	300 <sup>E</sup>	500,000EE	NC	NC	210	< 20	1,680	6,600	723	1,210
Copper	ug/L	1,000**	1,000 <sup>E</sup>	1,000E	20	NC	NC	3	2	2	1	1	2
Nickel	ug/L	NC	100	100	120	NC	NC	8	< 2	< 2	< 2	< 2	< 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	< 2	< 2	< 2	3	< 2	< 2
Zinc	ug/L	5,000**	2,400	5,000 <sup>E</sup>	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.

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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. <sup>E</sup> - 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 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.

**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.

Page 1 of 2 July 2022

# Summary of Groundwater Sampling Results (Analytical): May 2022 Second Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

									T				
							Sample Location:	MW-52	MW-53	MW-53R	MW-54R	MW-55	OW-57ROUT
	1		1			1 01 : 5 1	Sample Date:	5/9/2022	5/9/2022	5/9/2022	5/9/2022	5/10/2022	5/10/2022
				MI Non-		Chronic-Based	Acute-Based	Downgradient/	Downgradient/	Downgradient/	Downgradient/	Downgradient/	
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^	Mixing Zone GSI Criteria^	Mixing Zone GSI Criteria^	ĞSI	ĞSI	ĞSI	ĞSI	ĞSI	Downgradient
	Unit	EPA MCL	ivii Residentiai"	Residentiai	MI GSIA	Criteria	Criteria						
Appendix III <sup>(1)</sup>													
Boron	ug/L	NC	500	500	4,000	44,000	69,000	1,090	3,880	1,830	4,110	642	1,990
Calcium	mg/L	NC	NC	NC	500EE	NC	NC	231	147	226	169	177	131
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	50	NC	NC	50.5	50.9	41.6	35.8	11.8	57.3
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 <sup>E</sup>	250 <sup>E</sup>	500EE	NC	NC	591	215	314	86.3	249	69.4
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	NC	NC	1,490	886	1,290	712	942	702
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	NC	NC	7.0	7.3	6.9	7.0	7.0	7.1
Appendix IV <sup>(1)</sup>													
Antimony	ug/L	6	6.0	6.0	2	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	100	680	< 1	< 1	8	< 1	48	< 1
Barium	ug/L	2,000	2,000	2,000	1,200	NC	NC	107	356	147	111	222	79
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	2	< 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	< 1,000
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	25	41	61	64	24	27
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	9	78	7
Radium-226	pCi/L	NC	NC	NC	NC	NC	NC	< 0.489	0.406	< 0.325	< 0.347	< 0.478	< 0.440
Radium-228	pCi/L	NC	NC	NC	NC	NC	NC	< 0.532	< 0.518	< 0.480	< 0.552	< 0.646	< 0.539
Radium-226/228	pCi/L	NC	NC	NC	NC	NC	NC	0.875	0.824	< 0.480	< 0.552	0.696	< 0.539
Selenium	ug/L	50	50	50	5.0	55	120	2	1	2	2	3	3
Thallium	ug/L	2	2.0	2.0	2.0	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 11	15 <sup>(2)</sup>												
Iron	ug/L	300**	300 <sup>E</sup>	300€	500,000EE	NC	NC	2,030	1,060	460	121	15,000	74
Copper	ug/L	1,000**	1,000E	1,000 <sup>E</sup>	20	NC	NC	2	1	2	1	1	2
Nickel	ug/L	NC	100	100	120	NC	NC	< 2	< 2	< 2	< 2	3	14
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 <sup>E</sup>	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.

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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.
- <sup>E</sup> Criterion is the aesthetic drinking water value per footnote {E}.
- $^{\mbox{\scriptsize EE}}$  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 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.

**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.

July 2022

# Summary of Groundwater Sampling Results (Analytical): May 2022 DE Karn & JC Weadock Background – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	MW-15002	MW-15008	MW-15016	MW-15019
					Sample Date:	5/2/2022	5/2/2022	5/3/2022	5/2/2022
				MI Non-	'				
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^		Васко	ground	
Appendix III <sup>(1)</sup>									
Boron	ug/L	NC	500	500	4,000	103	112	329	236
Calcium	mg/L	NC	NC	NC	500EE	238	89.5	216	139
Chloride	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	50	2,210	197	243	324
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 <sup>E</sup>	250 <sup>E</sup>	500EE	6	4.99	267	62.5
Total Dissolved Solids	mg/L	500**	500 <sup>E</sup>	500 <sup>E</sup>	500	4,240	783	1,390	1,200
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 <sup>E</sup>	6.5 - 8.5 <sup>E</sup>	6.5 - 9.0	6.5	6.4	6.7	6.5
Appendix IV <sup>(1)</sup>									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	14	2	8	2
Barium	ug/L	2,000	2,000	2,000	1,200	682	52	72	308
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	3	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	16	16	80	12
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	1.37	< 0.447	< 0.368	< 0.579
Radium-228	pCi/L	NC	NC	NC	NC	3.30	< 0.588	< 0.611	1.83
Radium-226/228	pCi/L	5	NC	NC	NC	4.68	0.826	0.624	2.11
Selenium	ug/L	50	50	50	5	54	< 1	2	2
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 115 <sup>(2)</sup>	)								
Iron	ug/L	300**	300 <sup>E</sup>	300 <sup>E</sup>	500,000EE	16,100	15,500	8,020	21,000
Copper	ug/L	1,000**	1,000 <sup>E</sup>	1,000 <sup>E</sup>	20	3	< 1	5	< 1
Nickel	ug/L	NC	100	100	120	14	5	13	8
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	15	6	3	3
Zinc	ug/L	5,000**	2,400	5,000E	260	23	< 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

- \* Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- \*\* 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 EGLE policy and procedure 09-014 dated June 20, 2012.
- <sup>E</sup> Criterion is the aesthetic drinking water value per footnote {E}.
- $^{\mbox{\scriptsize EE}}$  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 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.

**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 Field Parameters: May 2022 Second Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen	Oxidation Reduction Potential	рН	Specific Conductivity	Temperature	Turbidity
		(mg/L)	(mV)	(SU)	(umhos/cm)	(°C)	(NTU)
Background		<u> </u>					
MW-15002	5/2/2022	0.00	-49.7	6.5	5,911	9.2	10.0
MW-15008	5/2/2022	0.05	-73.2	6.4	1,347	8.5	9.5
MW-15016	5/3/2022	0.01	-84.0	6.7	1,390	8.1	10.0
MW-15019	5/2/2022	0.01	-71.1	6.5	1,414	7.3	4.0
Weadock Landfill							
JCW-MW-18001	5/9/2022		-16.0	7.0	2,600	11.6	5.0
JCW-MW-18004	5/10/2022		219.5	6.8	1,650	10.0	1.9
JCW-MW-18005	5/10/2022		97.8	6.8	1,815	12.8	10.0
JCW-MW-18006	5/9/2022		-49.0	7.0	1,363	16.0	2.7
MW-50	5/9/2022		-20.0	7.2	1,483	9.7	2.7
MW-51	5/9/2022		-29.5	7.2	2,076	9.0	2.8
MW-52	5/9/2022		-80.0	7.0	2,000	10.5	2.8
MW-53	5/9/2022		-49.0	7.3	1,382	10.1	3.8
MW-53R	5/9/2022		59.7	6.9	2,000	10.5	4.0
MW-54R	5/9/2022		46.0	7.0	1,248	10.5	3.8
MW-55	5/10/2022		-65.5	7.0	1,495	9.7	5.0
OW-57ROUT	5/10/2022		100.0	7.1	1,290	15.9	3.9

#### Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard Units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celcius.

NTU - Nephelometric Turbidity Unit.

-- = Parameter Not Measured. The dissolved oxygen sensor on the water quality meter was not functioning.

### Table 5

### Summary of Confidence Interval Evaluation: May 2022 Second Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Assessment Mor	nitoring Stat	istical Evalua	ition																							
Constituent	Units	GWPS	MW	/-50	MV	V-51	MV	V-52	MV	V-53	MW	-53R	MW	-54R	MW	V-55	OW-57	'R OUT	JCW-M	W-18001	JCW-M\	W-18004	JCW-MV	N-18005	JCW-M	W-18006
Constituent	Units	GWF3	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL	LCL
Boron	ug/L	560	1,700	1,400	1,600	960	1,300	1,100	4,100	2,700	2,100	1,500	6,200	3,000	860	610	2,200	1,700	1,700	1,300			1,100	970	3,100	2,300
Calcium	mg/L	280	370	72	330	260				-									380	260	300	220	270	160		
Sulfate	mg/L	780	980	-74															1,200	680						
Arsenic	ug/L	21									33	11			(1)	(1)			38	1.0					32	17
Molybdenum	ug/L	73													(1)	(1)										
Iron	ug/L	28,000													36,000	17,000										
Vanadium	ug/L	6																	12	2.0						

GSI Statistical Evaluation								
Constituent	Units	GSI	MW-55					
Constituent	Offics	GSI	UCL	LCL				
Arsenic	ug/L	100	190	78				
Molybdenum	ug/L	120	200	100				

### 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 ( $\alpha$  = 0.01) of the downgradient data set.

LCL - Lower Confidence Limit ( $\alpha$  = 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) 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 (TRC, January 2022); therefore, confidence intervals were not calculated

### Table 6

### EGLE Exceedance Summary Table Second Quarter 2022 Quarterly Report JC Weadock Solid Waste Disposal Area, Essexville, Michigan

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

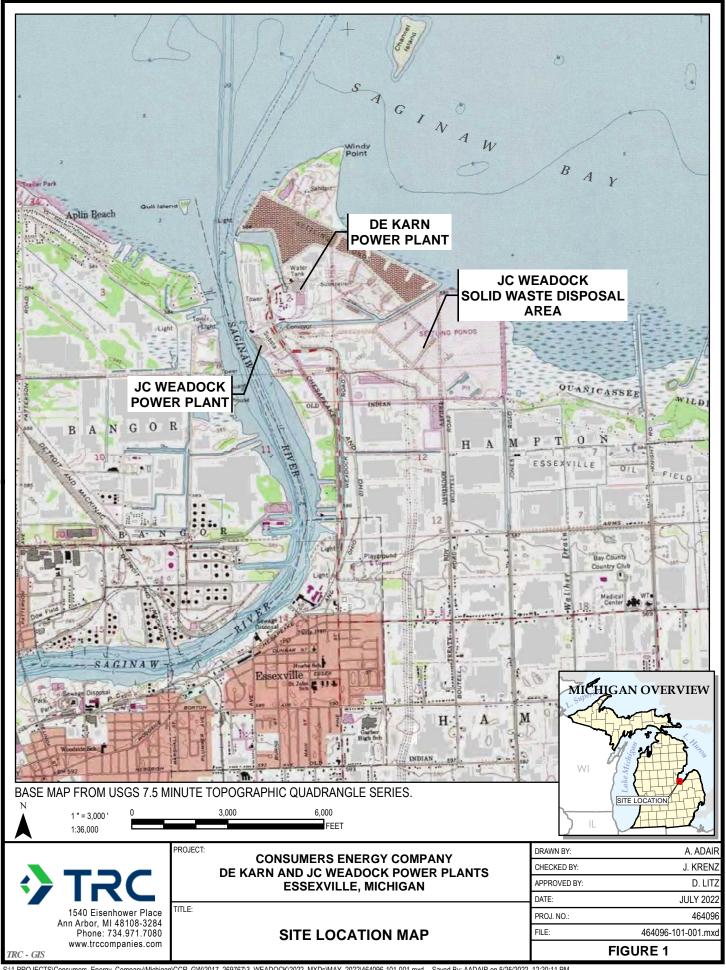
Data is in	(X) ug/L	or	
	( ) mg/L		
unless otherw	ise stated		

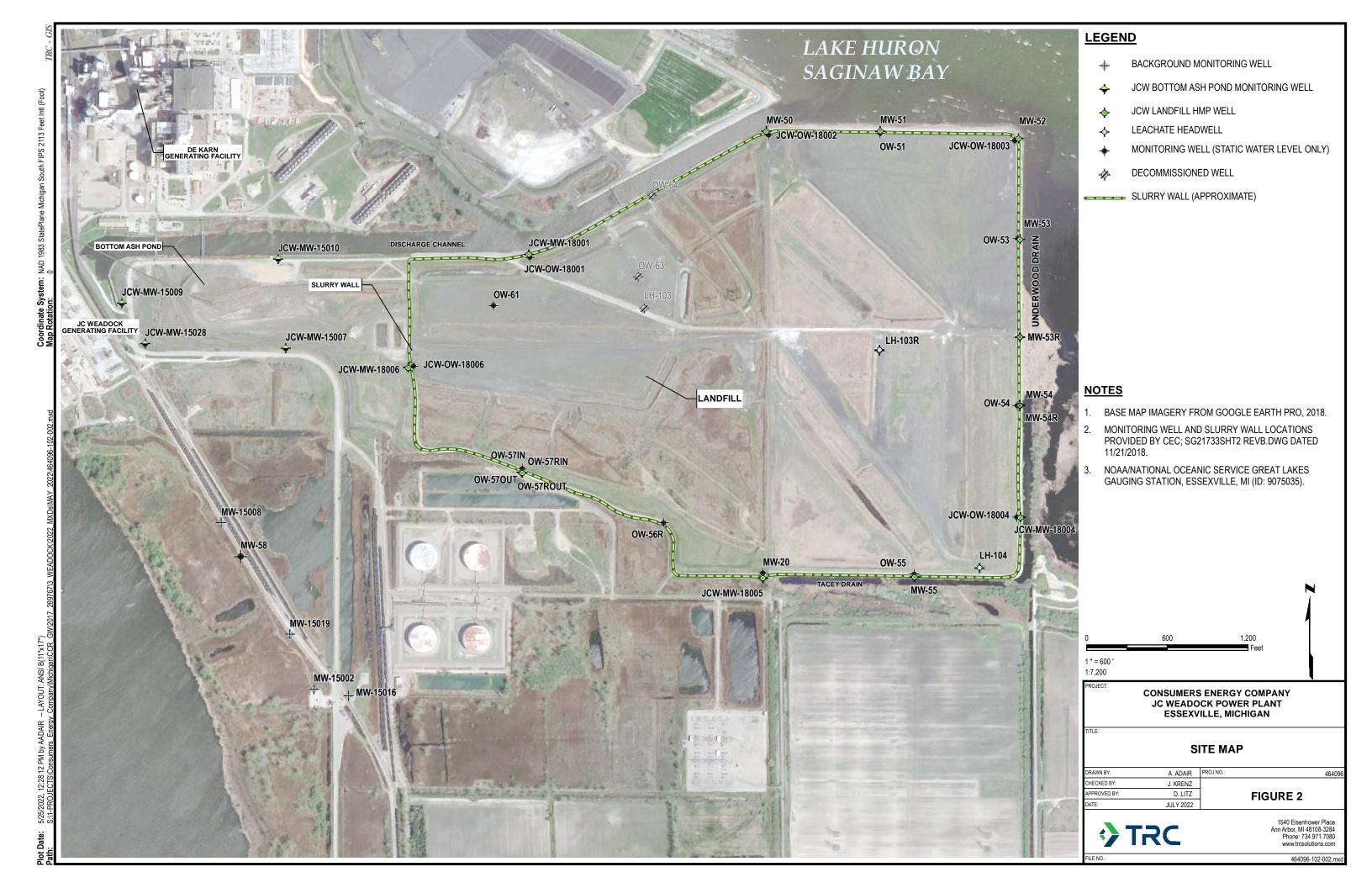
Facility: JC Weadock - WDS# 395457

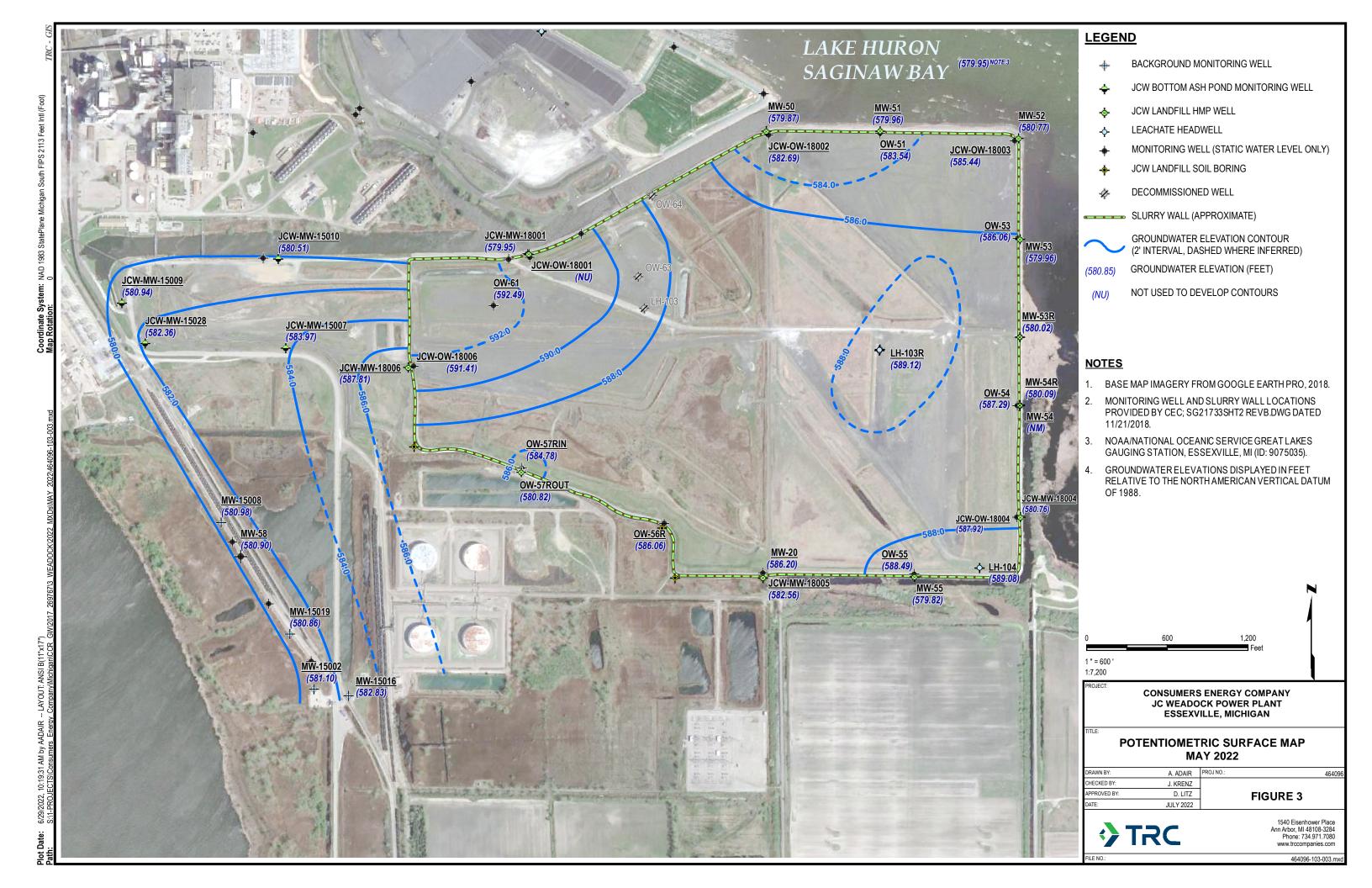
Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	2 Qtr. 2022 ( <b>bold</b> >201)	1 Qtr. 2022 ( <b>bold</b> >201)	4 Qtr. 2021 ( <b>bold</b> >201)	3 Qtr. 2021 ( <b>bold</b> >201)		
	No Exceedances at Compliance Locations									
		No Exceeda	nces a	at Complia	nce Locat	ions				
		No Exceeda	nces a	at Complia	nce Locat	ions				



## **Figures**









# Appendix A Static Water Level Evaluation

### Table A1

# Static Water Levels for Select Perimeter Dike Monitoring Wells and NOAA Staff Gauge Second Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Well Location	Date Measured	Groundwater Water Elevation (GWE) (ft)	Saginaw Bay Surface Water Elevation (SWE) (ft)	Elevation Difference (GWE- SWE) <sup>(1)</sup>
MW-50	5/2/2022	579.87		-0.08
MW-51	5/2/2022	579.96		0.01
MW-52	5/2/2022	580.77		0.82
MW-53	5/2/2022	579.96	579.95	0.01
MW-53R	5/2/2022	580.02	579.95	0.07
MW-54R	5/2/2022	580.09		0.14
MW-55	5/2/2022	579.82		-0.13
JCW-MW-18004	5/2/2022	580.76		0.81
Averag	e:	580.16		

### 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

### Second Quarter 2022 Quarterly Report

JC Weadock Solid Waste Disposal Area, Essexville, Michigan

Mean

Section

Saturated

	SWL Obs Well	SAAT IMIAA	X <sub>wells</sub>	ı	Saturated	iviean	Section	r.	ı	Area	Flow	Flow	FIOW
Discharge Channel	(ft NAVD 88)	(ft NAVD 88)	(ft)	(ft/ft)	Thickness (ft)	Thickness (ft)	Length (ft)	(cm/sec)	(ft/ft)	(ft <sup>2</sup> )	ft <sup>3</sup> /day	Gal/day	Gal/yr
JCW-OW-18001 <sup>(6)</sup>	588.76		22.37	3.94E-01	2.00	2.88	1,010		0.39	2,904	7.46E-02	0.56	204
JCW-MW-18001		579.95			3.75			2.30E-08	0.55	2,304	7.40L-02	0.50	204
JCW-OW-18002	582.69		28.87	9.77E-02	4.00	4.25	970	2.30L-00	0.10	4,123	2.63E-02	0.20	72
MW-50		579.87			4.50				0.10	4,123	2.03L-02	0.20	12
Monitoring Well Pair	SWL Obs Well	SWL MW	X <sub>wells</sub>	i	Saturated	Mean	Section	K	i	Area	Flow	Flow	Flow
Adjacent Zone	(ft NAVD 88)	(ft NAVD 88)	(ft)	(ft/ft)	Thickness (ft)	Thickness (ft)	Length (ft)	(cm/sec)	(ft/ft)	(ft <sup>2</sup> )	ft <sup>3</sup> /day	Gal/day	Gal/yr
OW-51	583.54		14.38	2.49E-01	4.00	4.33	1,850		0.25	8,011	1.30E-01	0.97	355
MW-51		579.96			4.66				0.23	0,011	1.30L-01	0.97	333
JCW-OW-18003	585.44		33.85	1.38E-01	3.50	4.00	740	2.30E-08	0.14	2,960	2.66E-02	0.20	73
MW-52		580.77			4.50				0.11	2,000	2.002 02	0.20	
OW-53	586.06		20.14	3.03E-01	1.25	1.69	730		0.30	1,230	2.43E-02	0.18	66
MW-53		579.96			2.12				0.00	1,200	2.102 02	0.10	
Monitoring Well Pair	SWL Obs Well	SWL MW	X <sub>wells</sub>	i	Saturated	Mean	Section	K	i	Area	Flow	Flow	Flow
Non-Adjacent Zone	(ft NAVD 88)	(ft NAVD 88)	(ft)	(ft/ft)	Thickness (ft)	Thickness (ft)	Length (ft)	(cm/sec)	(ft/ft)	(ft <sup>2</sup> )	ft <sup>3</sup> /day	Gal/day	Gal/yr
OW-54	587.29	,	21.23	3.39E-01	2.00	2.25	510	,	0.04	4 4 4 0	0.545.00	0.40	
MW-54R		580.09			2.50				0.34	1,148	2.54E-02	0.19	69
JCW-OW-18004	587.92		26.59	2.69E-01	8.00	4.43	820		0.27	2 622	6 205 02	0.40	171
	587.92	580.76	26.59	2.69E-01	8.00 0.86	4.43	820	2 205 00	0.27	3,633	6.38E-02	0.48	174
JCW-OW-18004	587.92		26.59 23.95			4.43 1.91	820 1,220	2.30E-08		·			
JCW-OW-18004 JCW-MW-18004	587.92 588.49				0.86			2.30E-08	0.27	3,633 2,330	6.38E-02 5.50E-02	0.48	174 150
JCW-OW-18004 JCW-MW-18004 OW-55	587.92 588.49	580.76	23.95		0.86 2.00			2.30E-08		·			

(cubic it per day) = 0.43(cubic ft per min) 3.0E-04

Calculated Groundwater Discharge from JC Weadock (gal per yr) = 1,187

cubic ft per yr) = 159

Calculated Groundwater Discharge from JC Weadock (gal per year per linear foot of dike) = 0.13

(cubic feet per year per linear foot of dike) = 1.77E-02

Area

Flow

#### Notes:

Monitoring Well Pair

Water level data collected on May 2, 2022 are shown by yellow cells:

SWI Obs Well

SWI MW

X...alla

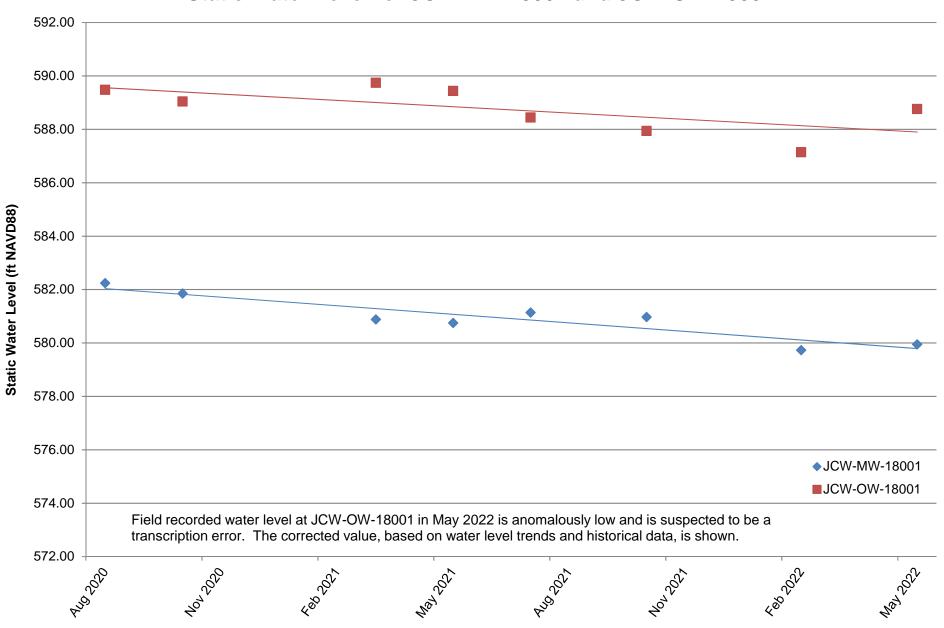
- 1. Monitoring Well Zones based on Phase II Evaluation, Appendix K Groundwater Discharge Calculations, September 30, 2005. Representative wells based on the Landfill Hydrogeological Monitoring Plan, February 2021.
- 2. Saturated thickness will be the thickness of the sand unit when the observed SWL 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.
- 6. Field recorded water level is anomalously low and is suspected to be a transcription error. The corrected value, based on water level trends and historical data, is used to calculate flux.

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

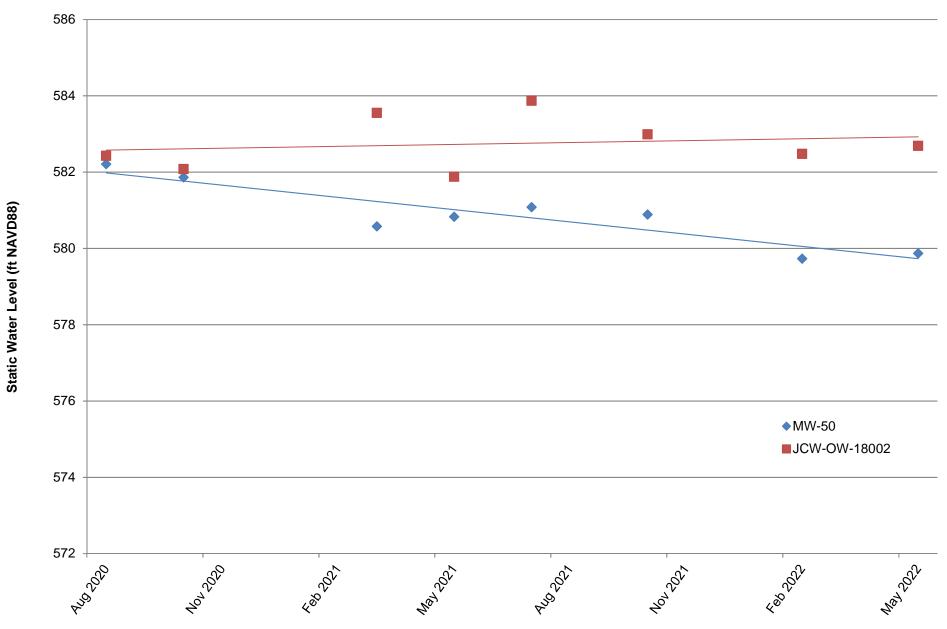
ft/ft = feet per foot; cm/sec = centimeters per second; ft<sup>2</sup> = square feet; ft<sup>3</sup>/day = cubic feet per day; Gal/day = gallons per day; Gal/yr = gallons per year

i = hydraulic gradient; K = hydraulic conductivity; x<sub>wells</sub> = distance between well pairs

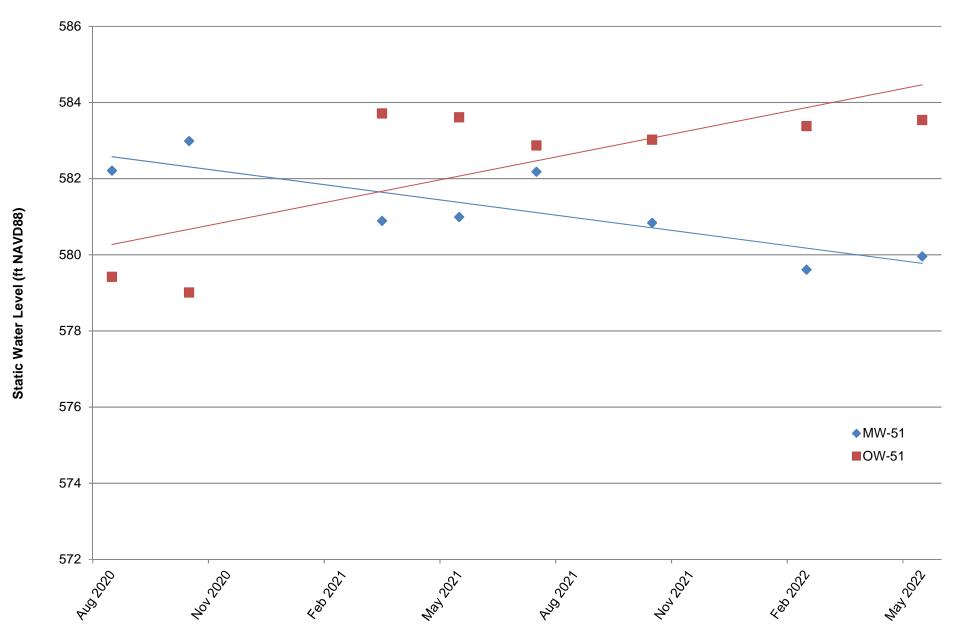
Appendix A
Static Water Level for JCW-MW-18001 and JCW-OW-18001



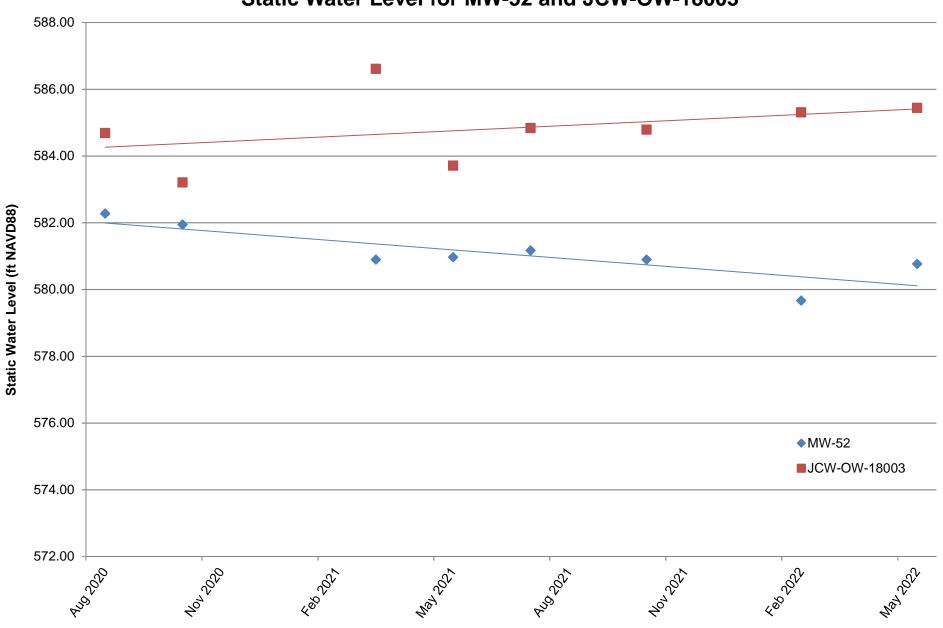
Appendix A
Static Water Level for MW-50 and JCW-OW-18002



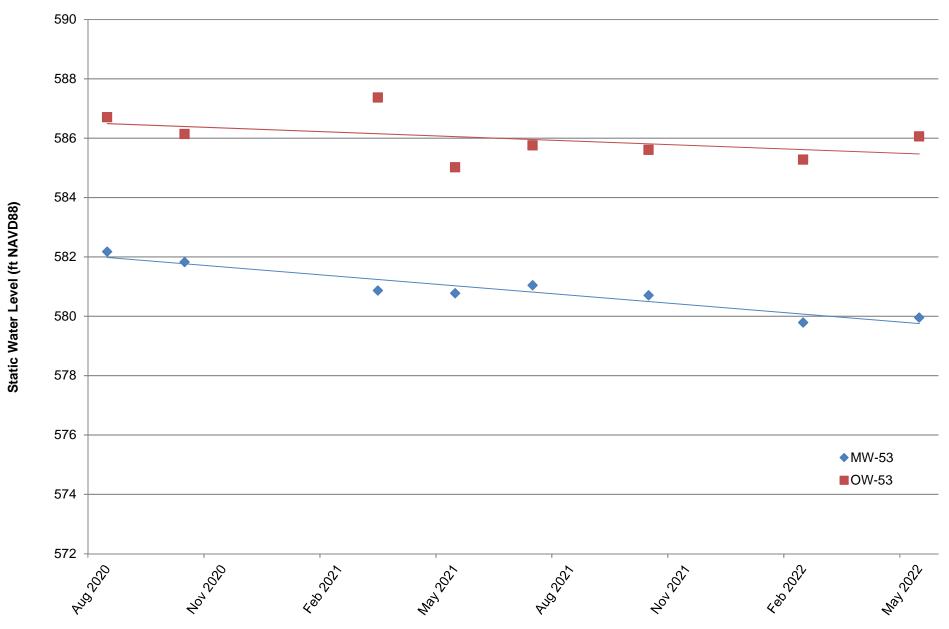
Appendix A
Static Water Level for MW-51 and OW-51



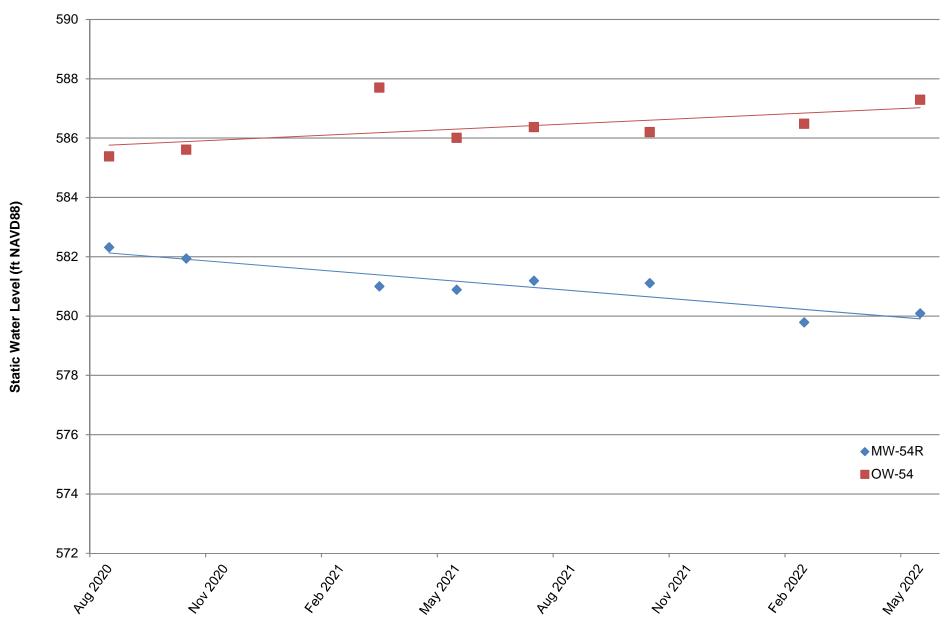
Appendix A
Static Water Level for MW-52 and JCW-OW-18003



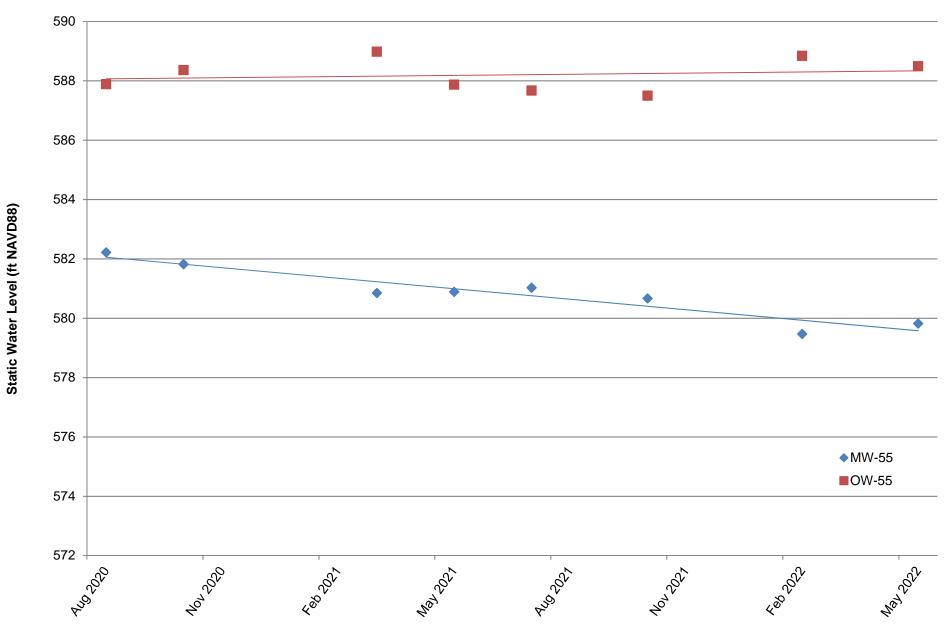
Appendix A
Static Water Level for MW-53 and OW-53



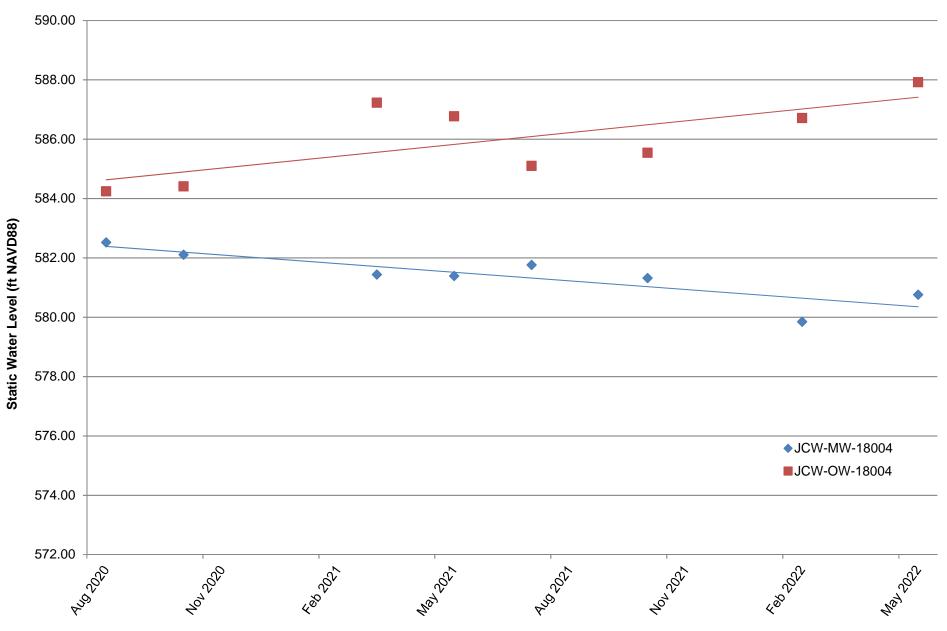
Appendix A
Static Water Level for MW-54R and OW-54



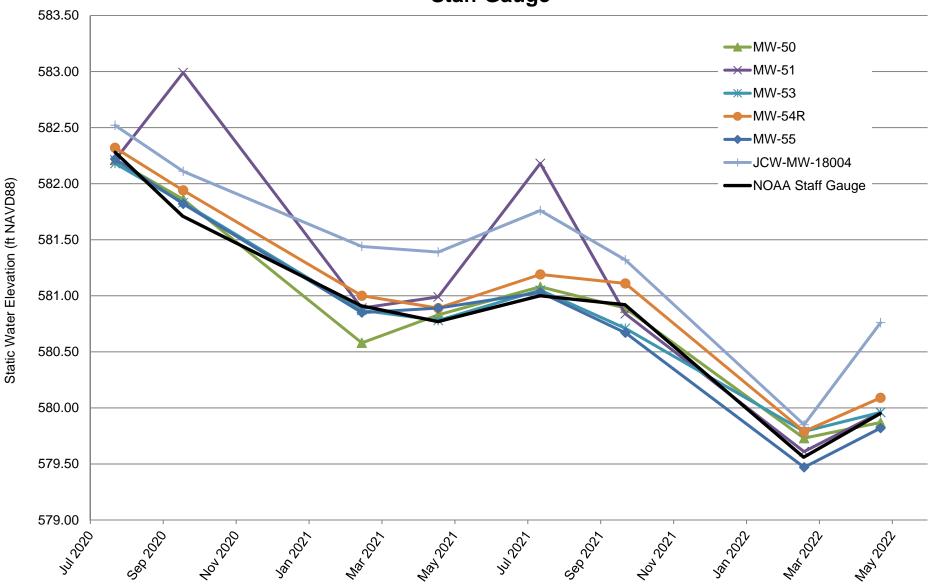
Appendix A
Static Water Level for MW-55 and OW-55



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 May 2022 JC Weadock Landfill

Porewater samples were collected by TRC for the May 2022 sampling event. Samples were 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) 22-0441.

During the May 2022 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 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) sample were collected. Total metals and anions were not detected in these blank samples.
- MS and MSD analyses were performed on sample JCW-MW-18001 for total metals, anions, and alkalinity. The recoveries were within the acceptance limits. Relative percent differences (RPDs) 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.

- The field duplicate pair samples were DUP-JCW-LF-02/JCW-MW-18006 and DUP-JCW-LF-01/MW-50; all criteria between the parent and duplicate samples were within the QC limits with the following exception.
  - Nickel was not detected in sample MW-50 and was detected <5x the RL in the field duplicate sample, DUP-JCW-LF-01; the absolute difference was > the RL. Therefore, the positive and nondetect results for nickel in all porewater samples except DUP-JCW-LF-02 and JCW-MW-18006 are estimated 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 JC Weadock, Landfill Wells – CCR Monitoring Program Essexville, Michigan

Collection Date	Analyte	Non-Conformance/Issue
5/9/2022 5/10/2022		
5/9/2022		
5/9/2022	Nickol	Potential uncertainty; field duplicate variability.
5/9/2022	Mickel	Potential uncertainty, neid duplicate variability.
5/10/2022		
5/9/2022		
	Date  5/9/2022 5/10/2022 5/10/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022	Date  5/9/2022 5/10/2022 5/10/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022 5/9/2022

# Laboratory Data Quality Review Porewater Monitoring Event May 2022 JC Weadock Landfill

Porewater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166413-1.

During the May 2022 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	•	OW-57R-OUT

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 (EB-01) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative error ratios (RER) for all target analytes were within laboratory control limits.
- MS/MSD analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-01/MW-50. All criteria were met.
- Carrier recoveries were within 40-110%.

# Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock/DE Karn Background

Groundwater samples were collected by TRC for the May 2022 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) 22-0443.

During the May 2022 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. Total metals were not detected in this blank sample.
- MS and MSD analyses were not performed on a sample from this data set.
- The field duplicate pair samples were DUP-Background and MW-15008; all criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

# Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock/Karn DEK Background

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166150-1.

During the May 2022 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 (EB-04) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
  - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with all samples. Positive detections of radium 228 in select samples should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-04/MW-15008. All criteria were met.
- Carrier recoveries were within 40-110%.

### Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data JC Weadock and DE Karn Background Wells – CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
MW-15002	5/2/2022		
MW-15019	5/2/2022	Radium 228	Detected results should be considered estimated due to LCS/LCSD Relative Error Ratio (RER) outside of criteria.
DUP-04	5/2/2022		



# Appendix C **Detection Monitoring Statistical Trend Tests**

### Appendix C

Detection Monitoring Statistical Summary for JC Weadock Facility Second Quarter 2022 Quarterly Report Data from August 2020 to May 2022

Porewater Monitoring Points						
PARAMETER	JCW-MW-18001	JCW-MW-18004	JCW-MW-18005	JCW-MW-18006	MW-50	MW-51
Boron	0	0	0	0	0	1
Calcium	0	0	0	0	<b>↓</b>	0
Chloride	0	0	0	0	0	0
Fluoride	O*	O*	O*	O*	O*	O*
Iron	0	0	0	0	0	0
pH/Corrosivity	0	0	0	0	0	0
Sulfate	↑ <sup>ASD</sup>	0	0	0	<u> </u>	<u> </u>
Total Dissolved Solids	↑ ASD	0	0	0	↓*	0

#### Notes:

O\* = Non-detect (70%)

O = No trend

↑ = Upward trend, continuous

↑\* = Upward trend, new

↑ = Upward trend, confirmed

= Downward trend, continuous

\* = Downward trend, new

<sup>ASD</sup> = Alternate Source Demonstration (Second Quarter 2022 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2022.)

### Appendix C

Detection Monitoring Statistical Summary for JC Weadock Facility Second Quarter 2022 Quarterly Report Data from August 2020 to May 2022

Porewater Monitoring Points						
PARAMETER	MW-52	MW-53	MW-53R	MW-54R	MW-55	OW-57R OUT
Boron	0	0	0	1	0	<b>↑</b>
Calcium	0	<b>↓</b>	0	0	0	0
Chloride	0	0	0	↑ <sup>ASD</sup>	0	0
Fluoride	O*	O*	O*	O*	O*	O*
Iron	0	0	0	0	0	0
pH/Corrosivity	0	0	0	0	0	0
Sulfate	0	0	0	0	0	0
Total Dissolved Solids	0	$\downarrow$	0	0	0	0

#### Notes:

O\* = Non-detect (70%)

O = No trend

↑ = Upward trend, continuous

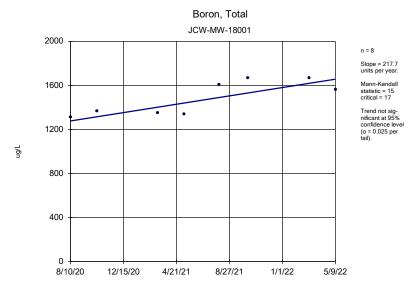
↑\* = Upward trend, new

↑ = Upward trend, confirmed

= Downward trend, continuous

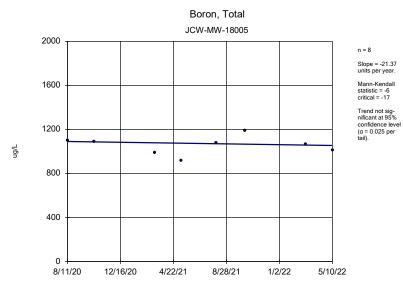
↓\* = Downward trend, new

↑ ASD = Alternate Source Demonstration (Second Quarter 2022 Hydrogeological Monitoring Report for the Weadock Landfill, TRC, July 2022.)



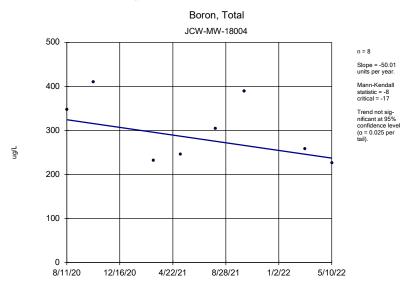
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

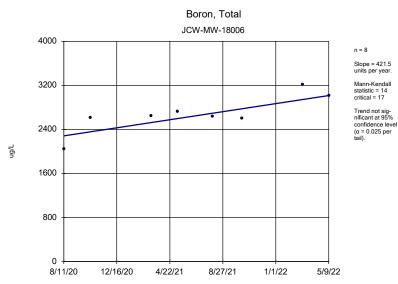
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

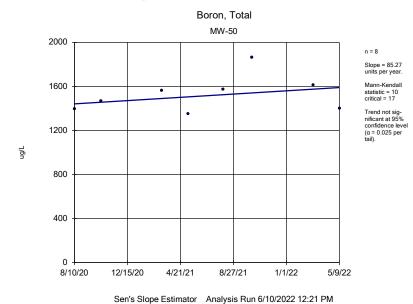
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

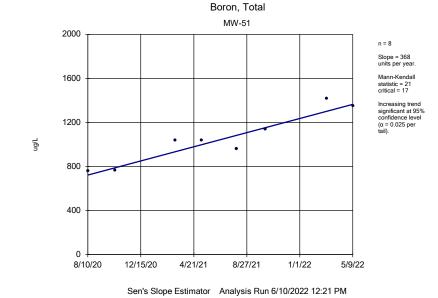
#### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

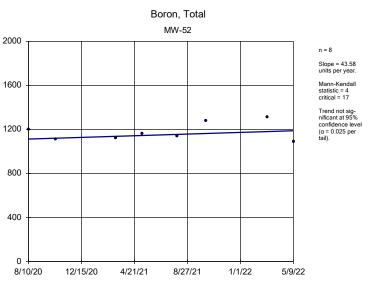




Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



ng/L

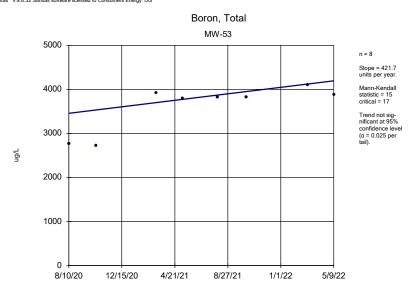


Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

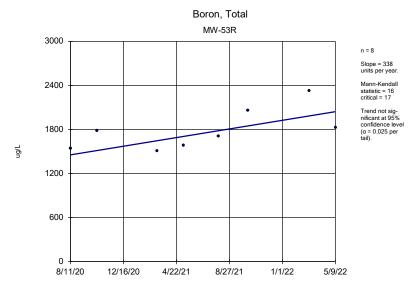
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



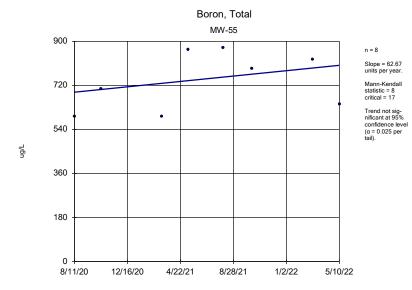
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



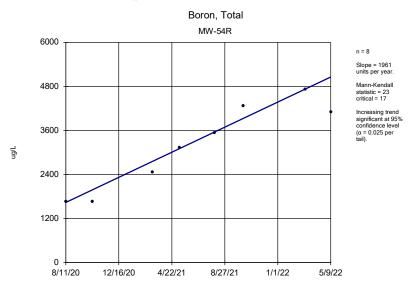
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

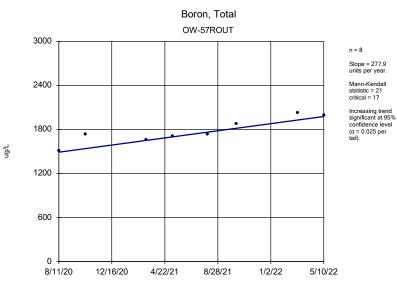


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

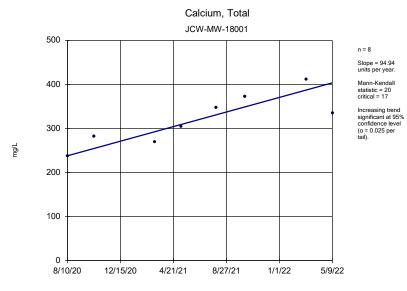


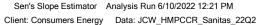
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

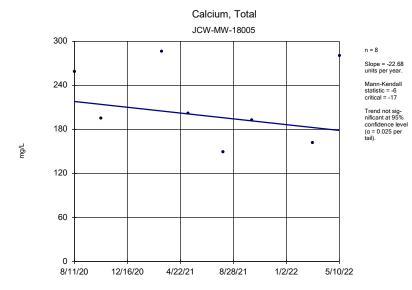


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

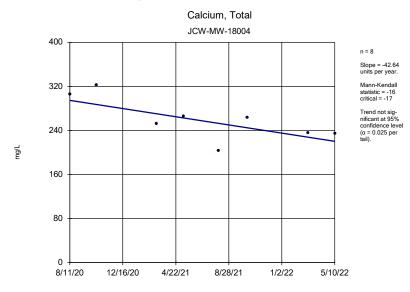






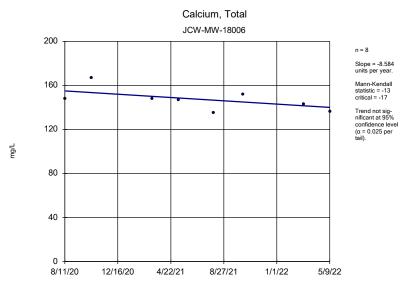
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



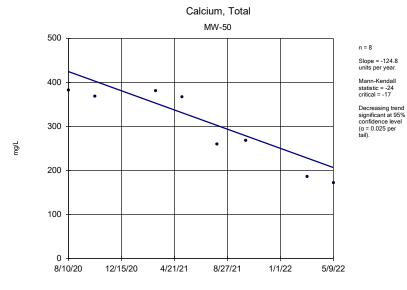
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM



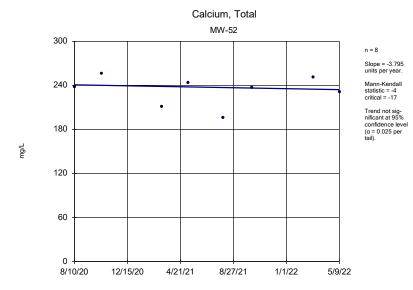
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



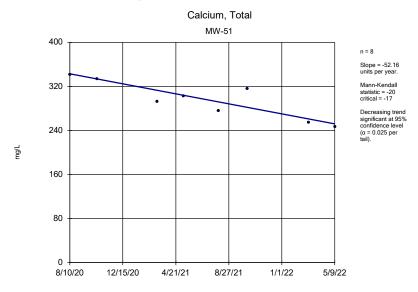
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

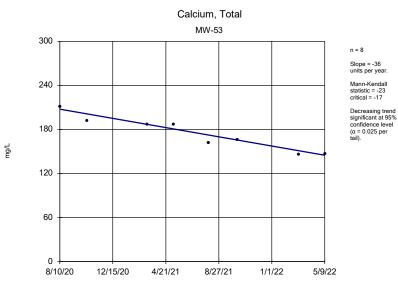


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

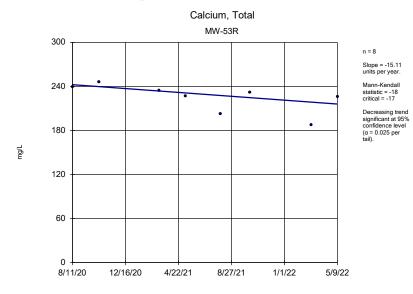


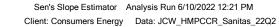
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

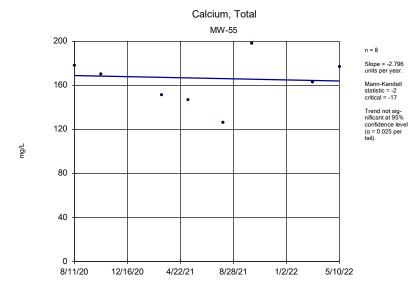


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

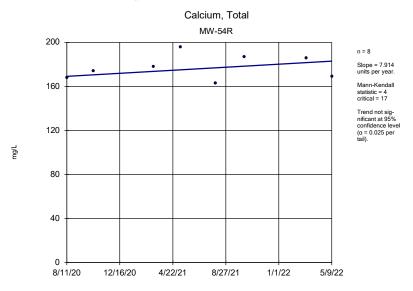






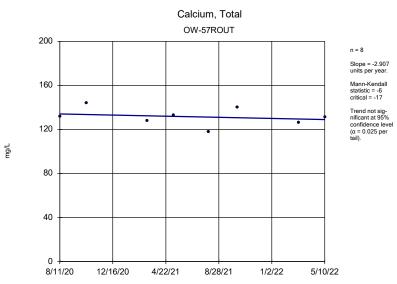
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM



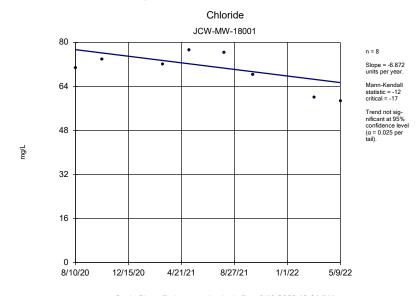
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

8/11/20

12/16/20

4/22/21



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Chloride

### JCW-MW-18005 n = 8 Slope = -4.9 units per year. Mann-Kendall statistic = -10 critical = -17 Trend not significant at 95% confidence level (a = 0.025 per tail).

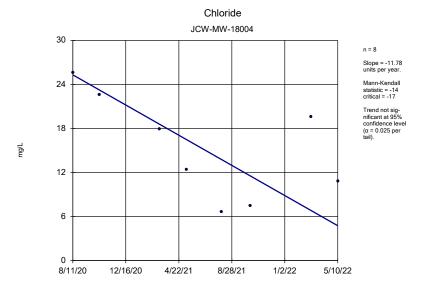
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

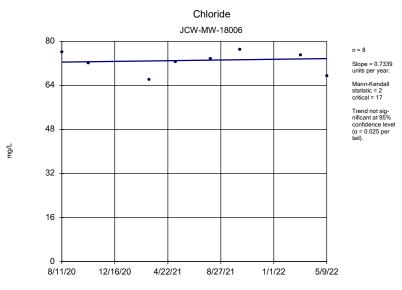
8/28/21

1/2/22

5/10/22



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



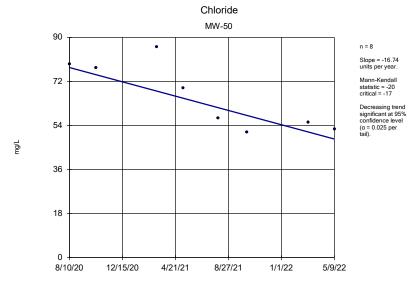
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

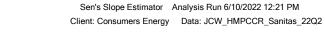
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

8/10/20

12/15/20

4/21/21





# Chloride MW-52 80 64 48 48 32 16

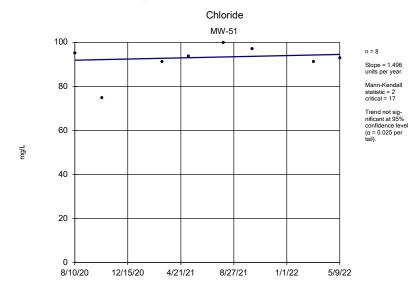
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

8/27/21

1/1/22

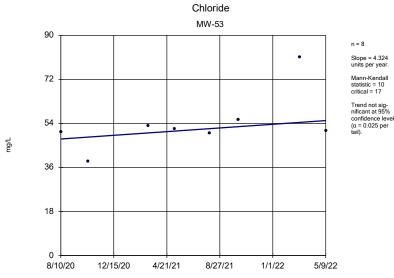
5/9/22



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

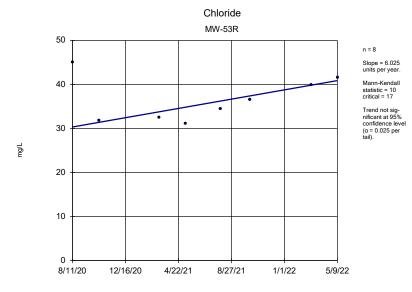
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas  $^{\text{\tiny{TM}}}$  v.9.6.32 Sanitas software licensed to Consumers Energy. UG



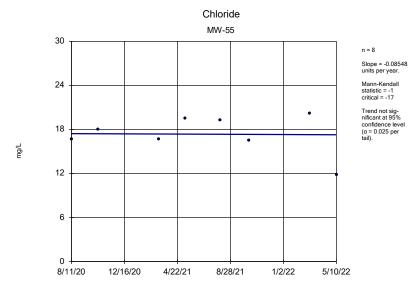
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



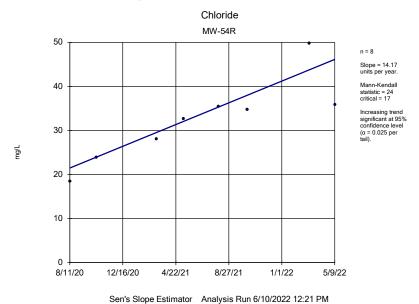
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

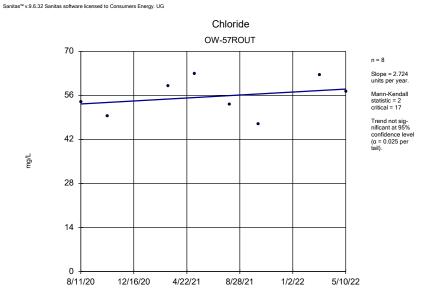


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



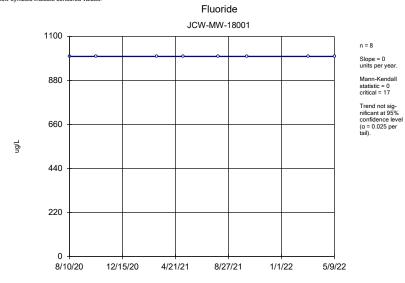
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



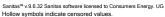
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

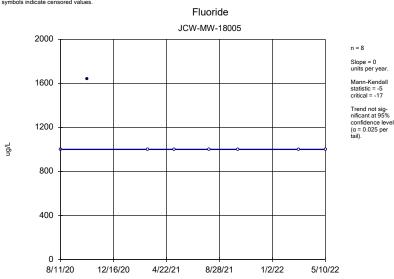
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

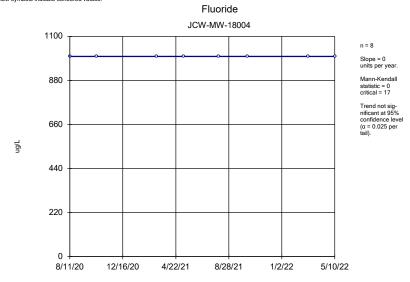




Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

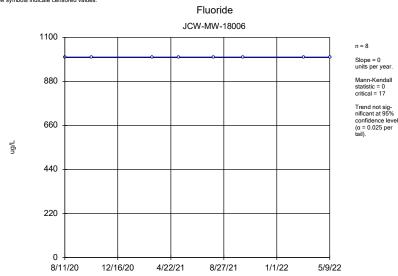
Sanitas<sup>tu</sup> v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR Sanitas 22Q2

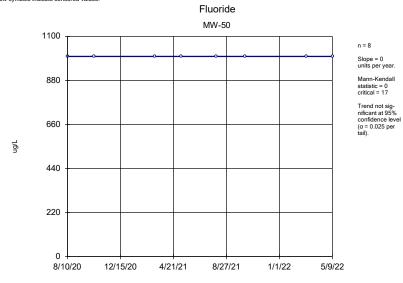
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

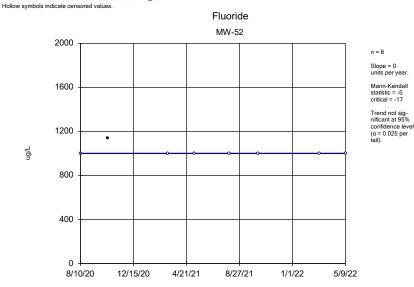
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

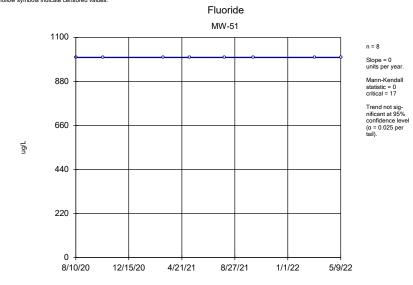
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

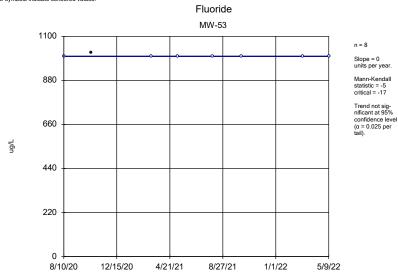
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

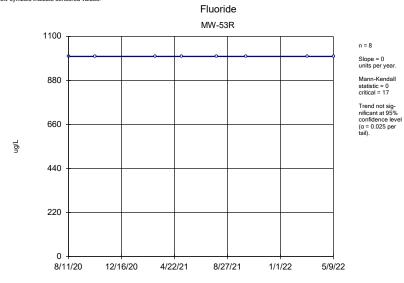
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

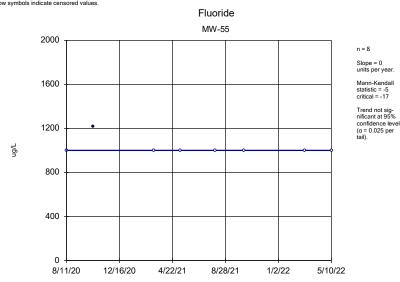
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

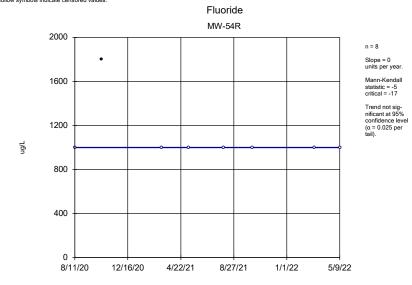
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

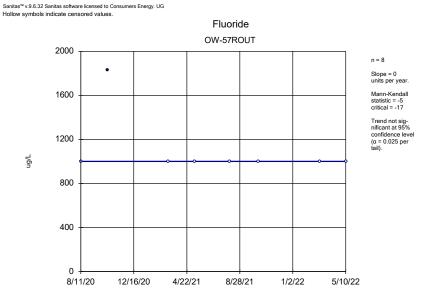
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG Hollow symbols indicate censored values.



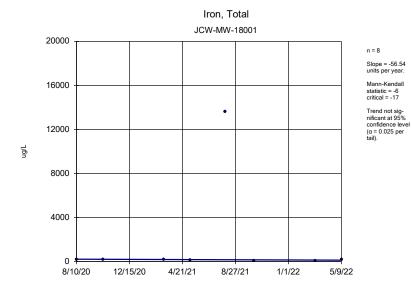
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

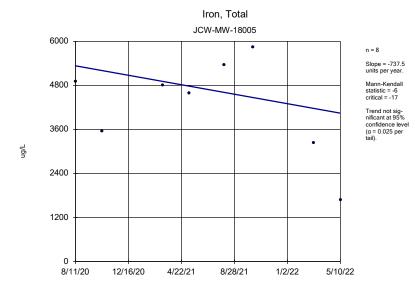


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

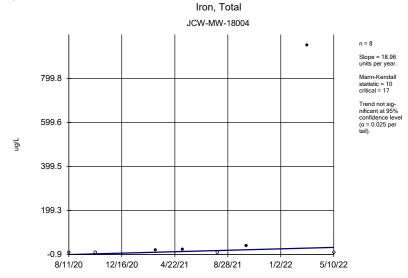


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

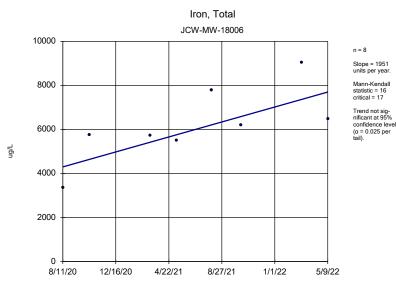


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

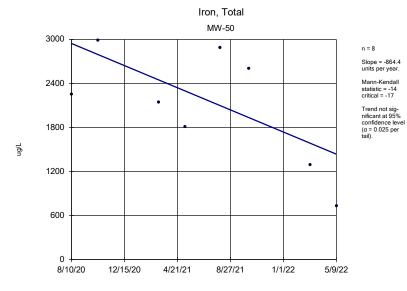
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

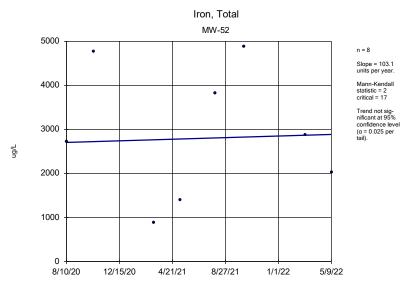


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



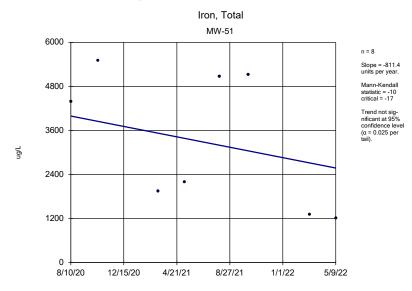
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



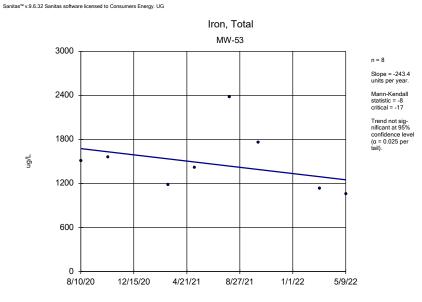
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



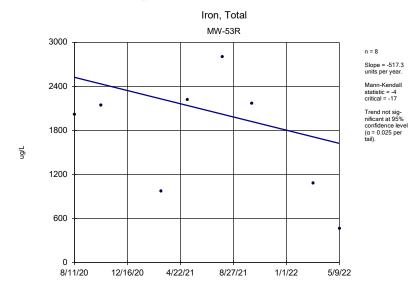
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



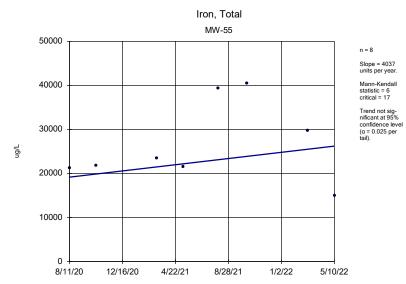
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



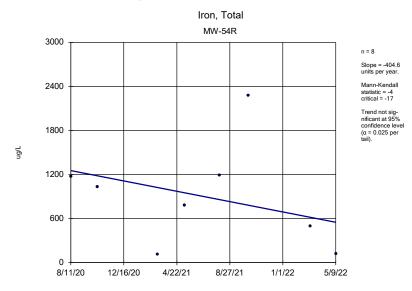
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

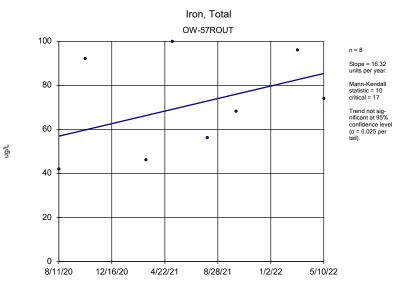


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

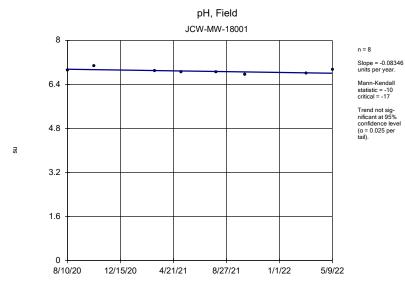


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

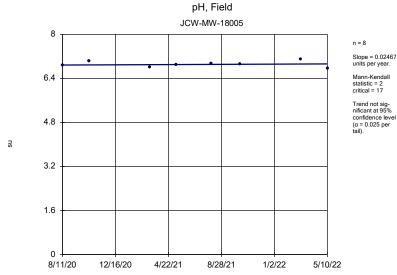
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

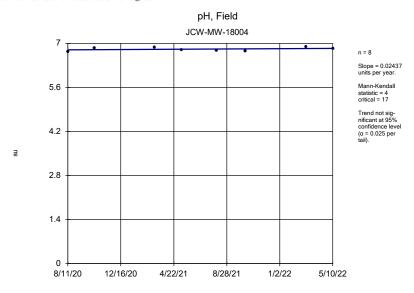
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

### Sanitas $^{\mbox{\tiny MM}}$ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



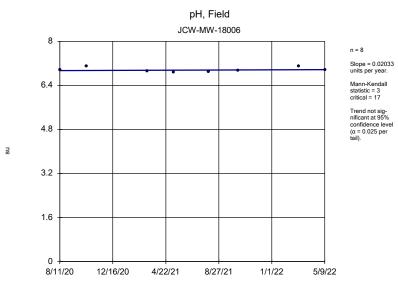
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



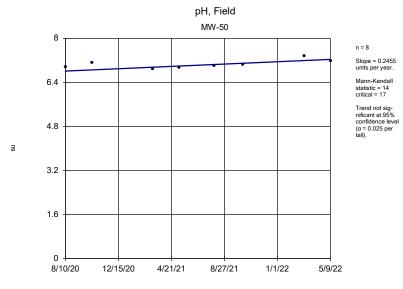
Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

8/10/20

12/15/20

4/21/21



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

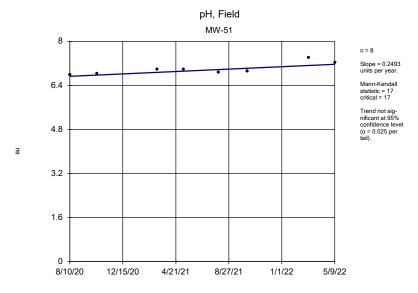
## PH, Field MW-52 8 6.4 4.8 4.8 3.2

Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

8/27/21

1/1/22

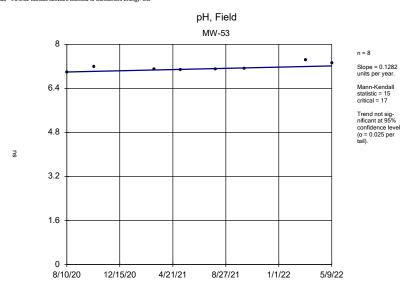
5/9/22



Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

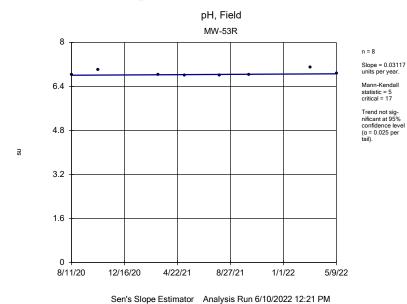
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



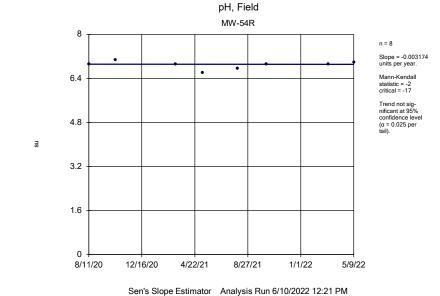


Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

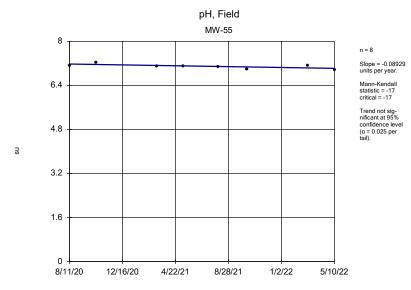


Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

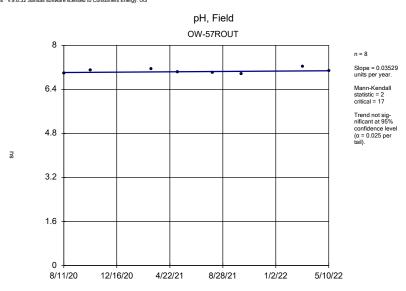




Sen's Slope Estimator Analysis Run 6/10/2022 12:21 PM

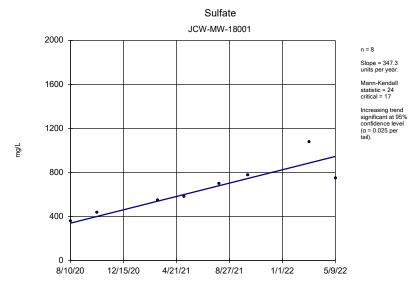
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

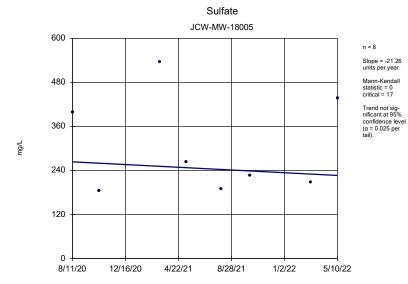
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

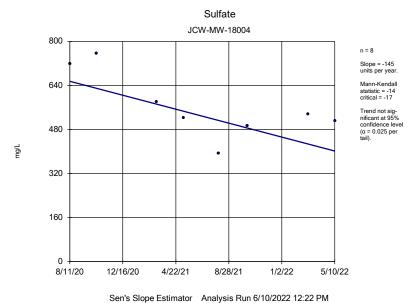
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



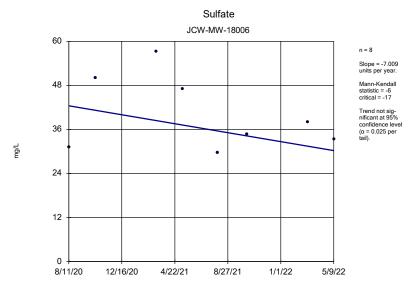


Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

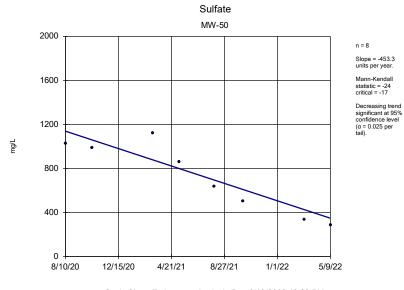


Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

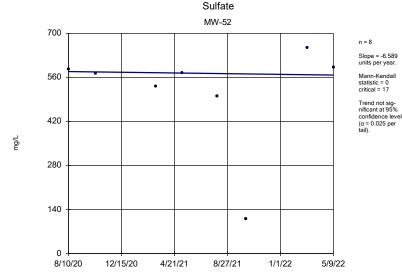
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

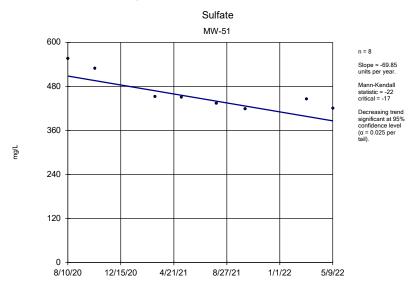
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

### Sanitas $^{\text{\tiny{1M}}}$ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



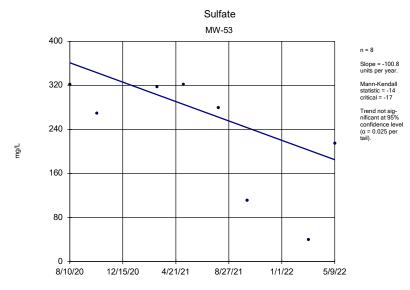
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



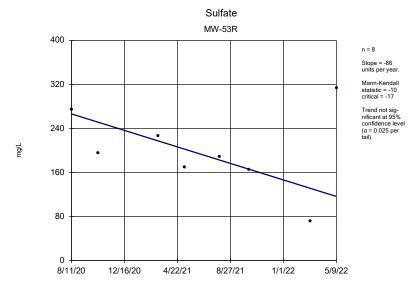
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



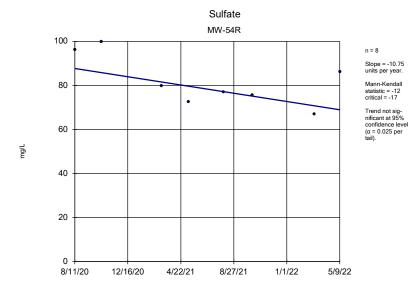
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

### Sulfate MW-55 300 Slope = -7.994 units per year. Mann-Kendall 240 statistic = -2 critical = -17 Trend not sig-nificant at 95% confidence level 180 (α = 0.025 per tail). 120 60 8/11/20 12/16/20 4/22/21 8/28/21 1/2/22 5/10/22

Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

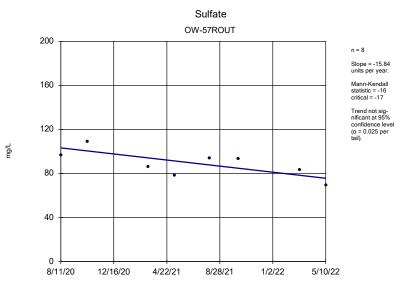
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

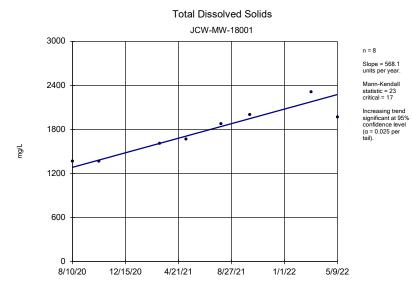
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



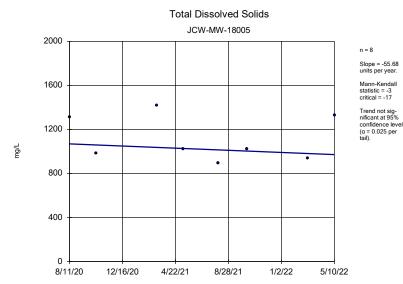


Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

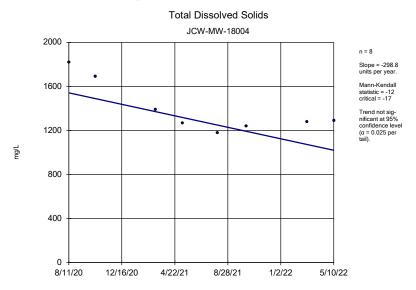


Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

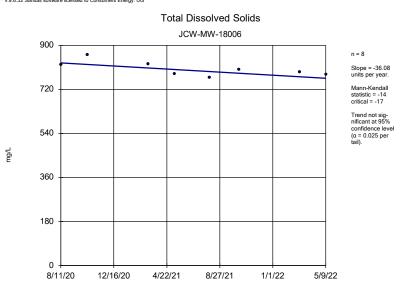
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



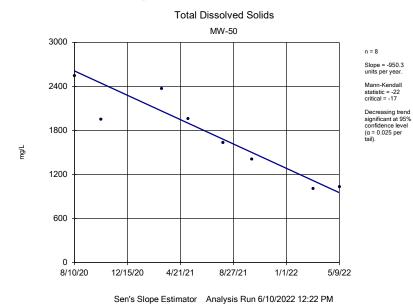
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG



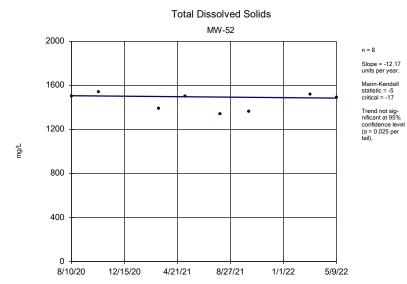
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

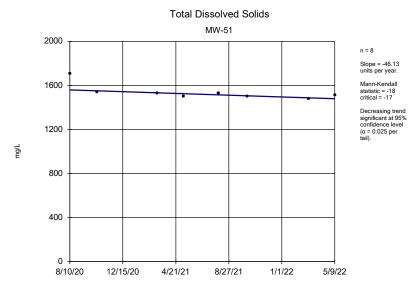


### Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG

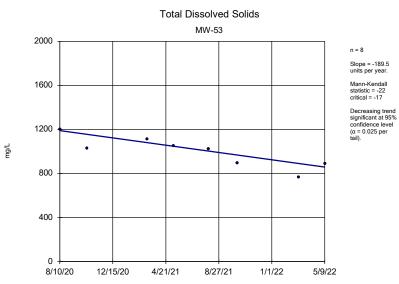


Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

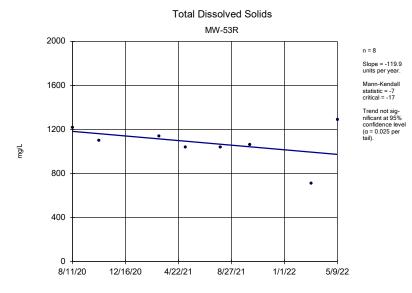


Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



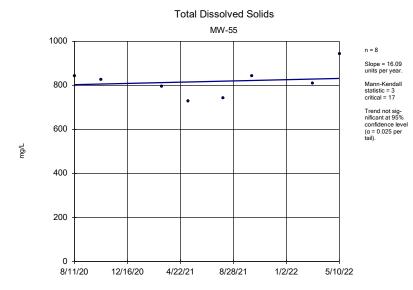
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



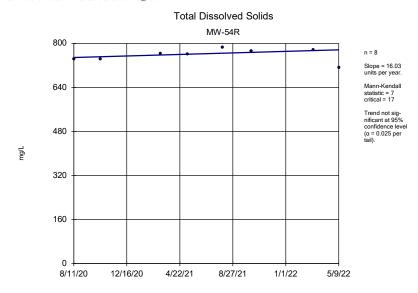
Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

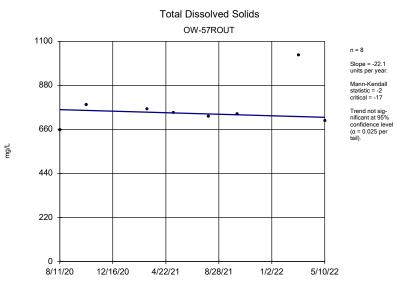


Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 12:22 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



### Appendix D Assessment Monitoring and GSI Statistical Evaluation



**Date:** June 30, 2022

**To:** J.R. Register, Consumers Energy

From: Darby Litz, TRC

Alex Eklund, TRC

**Project No.:** 464096.0000 Phase 002, Task 002

Subject: Assessment Monitoring and GSI Statistical Evaluation of the May 2022 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 Rule¹ at the JC Weadock Power Plant Landfill and quarterly groundwater monitoring in accordance with the February 2021 Landfill Hydrogeological Monitoring Plan (HMP). The second quarter 2022 monitoring event was conducted on May 2 through 10, 2022. 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 (TRC, April 2021). 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 downgradient wells. The three downgradient wells were located within a vent (e.g., opening) of the

\_

<sup>&</sup>lt;sup>1</sup> 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).

perimeter soil/bentonite slurry wall to assess the quality of groundwater passing the waste boundary. As discussed in detail below, 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 of the change in groundwater flow conditions, 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 2022 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	<b>#Downgradient Wells Exceeded</b>
Boron	560 μg/L	11 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 <sup>2</sup>, 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

\_

<sup>&</sup>lt;sup>2</sup> 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 2020 through May 2022) were retained for further analysis. Data collected under the previous HMP is used where available.

Groundwater data were evaluated utilizing Sanitas<sup>TM</sup> statistical software. Sanitas<sup>TM</sup> is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the Sanitas<sup>TM</sup> statistical program, confidence limits were selected 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<sup>3</sup> 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<sup>TM</sup> 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 trends. No outliers were identified in the data set.

The Sanitas<sup>TM</sup> 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

<sup>&</sup>lt;sup>3</sup> Confidence level is assessed for each individual comparison (i.e. per well and per constituent).

purposes of calculating the confidence intervals.

The Sanitas<sup>™</sup> 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<sup>4</sup> 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 MW-50, MW-51, JCW-MW-18001, JCW-MW-18004, and JCW-MW-18005;
- Sulfate in MW-50 and JCW-MW-18001:
- Arsenic in MW-53R, MW-55, JCW-MW-18001, and JCW-MW-18006;
- Molybdenum in MW-55;
- Iron in MW-55; and,
- Vanadium in JCW-MW-18001.

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, MW-54R, and OW-57ROUT, calcium at MW-50, and sulfate at JCW-MW-18001 and MW-50 are statistically significant (Attachment 1). The trends are causing the confidence

4

<sup>&</sup>lt;sup>4</sup> The past two years of available data (six events total) were used for constituents that were not previously included in quarterly monitoring for the Weadock Landfill, i.e. calcium, chloride, fluoride, total dissolved solids, beryllium, cadmium, cobalt, mercury, radium, thallium, nickel, and zinc. Use of the most recent two years of data ensure the timeframe for analysis is consistent with other constituents and is representative of current site conditions.

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, MW-54R, and OW-57ROUT, calcium at MW-50, and sulfate at JCW-MW-18001 and MW-50. 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<sup>™</sup> 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
	Boron at JCW-MW-18005, JCW-MW-18006, MW-50, MW-52, MW-53R, and MW-55
Normal	Calcium at JCW-MW-18001, JCW-MW-18004, JCW-MW-18005, and MW-51
	Arsenic at JCW-MW-18006 and MW-53R
	Iron at MW-55
Non Donomotivio (not able to	Boron at JCW-MW-18001 and MW-53
Non-Parametric (not able to be normalized)	Arsenic at JCW-MW-18001
Non-Parametric (over 50% non-detect)	Vanadium at JCW-MW-18001

The confidence interval test compares 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 below the GWPS since the second quarter 2021. Calcium concentrations at MW-51 were previously considered statistically significant; however, calcium concentrations appear to be decreasing and the lower confidence limit has been below the GWPS since the first quarter 2022. Concentrations 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. The boron exceedances are the result of the addition of the Appendix III constituents to the assessment monitoring statistical evaluation program in accordance with the HMP. 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; and
- Molybdenum 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 and molybdenum 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 and molybdenum 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<sup>™</sup> 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 Molybdenum 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 and molybdenum concentrations at MW-55 were previously considered statistically significant; however, the arsenic and molybdenum concentrations decreased in the first and second quarters of 2022. The lower confidence limits for arsenic and molybdenum continued to be below the GWPS in second quarter 2022.

### **Attachments**

Table 1	Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022
Table 2	Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022
Attachment 1	Assessment Monitoring Sanitas™ Output Files
Attachment 2	GSI Evaluation Sanitas™ Output Files

### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:								MW-50							
		Sample Date:	8/10/2020	8/10/2020	10/13/2020	3/8/2021	3/8/2021	5/10/2021	5/10/2021	8/2/2021	8/2/2021	10/11/2021	10/11/2021	3/8/2022	3/8/2022	5/9/2022	5/9/2022
		·		•			•		•			•	•	•	•	•	
Constituent	Unit	GWPS															
Appendix III <sup>(1)</sup>				Field Dup			Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
Boron	ug/L	560	1,430	1,360	1,470	1,510	1,610	1,380	1,320	1,520	1,630	1,830	1,900	1,610	1,620	1,360	1,440
Calcium	mg/L	280	382	382	368	386	375	363	370	267	252	274	261	186	185	169	175
Chloride	mg/L	2,300	78.5	79.9	77.5	86.5	85.6	68.9	69.9	57.0	57.2	51.0	51.7	54.9	55.6	53.3	51.6
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
Sulfate	mg/L	780	1,020	1,040	990	1,130	1,120	856	867	638	634	496	512	346	330	285	286
Total Dissolved Solids	mg/L	4,700	2,270	2,820	1,950	2,360	2,380	1,950	1,970	1,630	1,640	1,440	1,380	999	1,010	1,020	1,050
pH, Field	SU	6.5 - 8.5	7.0		7.1	6.9		6.9		7.0		7.1		7.4		7.2	
Appendix IV <sup>(1)</sup>																	
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	2	2	3	1	1	1	1	2	2	3	3	2	2	1	1
Barium	ug/L	2,000	150	153	147	116	115	108	109	91	97	102	89	115	117	86	86
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	111	115	100	126	128	100	100	79	81	93	68	77	77	69	66
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	7	8	7	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6	6	< 5	< 5
Radium-226	pCi/L	NA			< 0.537			< 0.237	< 0.245			< 0.215	0.243			< 0.310	< 0.287
Radium-228	pCi/L	NA			0.613			0.557	0.607			1.15	1.22			< 0.493	0.648
Radium-226/228	pCi/L	5.0			1.01			0.650	0.671			1.21	1.46			0.518	0.904
Selenium	ug/L	50	< 1	< 1	1	1	1	< 1	1	3	2	4	4	2	2	2	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters	S <sup>(2)</sup>																
Iron	ug/L	28,000	2,280	2,230	2,990	2,100	2,190	1,810	1,810	3,000	2,780	2,500	2,710	1,400	1,180	723	737
Copper	ug/L	1,000	3	7	3	4	4	< 1	2	1	< 1	1	< 1	< 1	< 1	1	1
Nickel	ug/L	100	< 2	2	< 2	< 2	< 2	< 2	< 2	11	12	16	11	< 2	19	< 2	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	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	2,400	< 30	< 30	< 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.

Page 1 of 12 July 2022

### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:	MW-51										
		Sample Date:	8/10/2020	10/14/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022		
Constituent	Unit	GWPS											
Appendix III <sup>(1)</sup>					Field Dup								
Boron	ug/L	560	758	739	798	1,040	1,040	960	1,140	1,420	1,350		
Calcium	mg/L	280	341	330	337	293	303	276	316	255	247		
Chloride	mg/L	2,300	95.2	74.2	75.4	91.2	93.6	99.8	97.1	91.1	92.8		
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	556	522	537	452	450	434	418	446	420		
Total Dissolved Solids	mg/L	4,700	1,710	1,550	1,530	1,530	1,500	1,530	1,500	1,480	1,510		
pH, Field	SU	6.5 - 8.5	6.8	6.8		7.0	7.0	6.9	6.9	7.4	7.2		
Appendix IV <sup>(1)</sup>													
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Arsenic	ug/L	21	12	17	17	11	11	14	20	12	10		
Barium	ug/L	2,000	153	147	150	143	148	148	197	198	150		
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	57	51	55	62	57	47	64	58	56		
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	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5		
Radium-226	pCi/L	NA		1.35	< 0.352		< 0.268		0.451		< 0.423		
Radium-228	pCi/L	NA		< 0.588	0.776		0.626		2.01		< 0.494		
Radium-226/228	pCi/L	5.0	-	1.43	1.11		0.851		2.46		0.576		
Selenium	ug/L	50	< 1	< 1	< 1	1	< 1	1	3	3	2		
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2		
MI Part 115 Parameters	(2)												
Iron	ug/L	28,000	4,390	5,400	5,600	1,940	2,200	5,080	5,130	1,310	1,210		
Copper	ug/L	1,000	2	2	2	2	< 1	< 1	1	< 1	2		
Nickel	ug/L	100	2	< 2	< 2	< 2	< 2	11	18	< 2	< 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	< 30	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		

Page 2 of 12

### 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.

### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:		, ,		MW	<u>l-52</u>	, ,		1
		Sample Date:	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,200	1,110	1,120	1,160	1,140	1,280	1,310	1,090
Calcium	mg/L	280	238	256	211	244	196	237	251	231
Chloride	mg/L	2,300	72.0	73.3	51.8	53.9	56.5	59.4	51.6	50.5
Fluoride	ug/L	4,000	< 1,000	1,140	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	586	572	531	574	501	110	654	591
Total Dissolved Solids	mg/L	4,700	1,500	1,540	1,390	1,500	1,340	1,360	1,520	1,490
pH, Field	SU	6.5 - 8.5	6.9	7.0	7.0	6.9	6.9	6.9	7.1	7.0
Appendix IV <sup>(1)</sup>										
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	144	139	123	132	115	152	170	107
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	1,140	< 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	38	33	31	29	21	31	27	25
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		0.744		< 0.237		< 0.274		< 0.489
Radium-228	pCi/L	NA		0.636		< 0.407		0.778		< 0.532
Radium-226/228	pCi/L	5.0		1.38		< 0.407		1.03		0.875
Selenium	ug/L	50	< 1	1	1	1	1	3	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	2,720	4,770	879	1,400	3,830	4,880	2,870	2,030
Copper	ug/L	1,000	2	2	2	< 1	< 1	1	1	2
Nickel	ug/L	100	< 2	< 2	< 2	< 2	9	14	< 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	< 30	< 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.

### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				MW	I-53			
		Sample Date:	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022
		·				•		•		
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	2,760	2,720	3,920	3,790	3,820	3,820	4,100	3,880
Calcium	mg/L	280	211	192	187	187	162	166	146	147
Chloride	mg/L	2,300	50.5	38.6	52.9	51.8	49.9	55.5	81.1	50.9
Fluoride	ug/L	4,000	< 1,000	1,020	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	321	269	317	322	279	111	39.5	215
Total Dissolved Solids	mg/L	4,700	1,200	1,030	1,110	1,050	1,020	896	768	886
pH, Field	SU	6.5 - 8.5	7.0	7.2	7.1	7.1	7.1	7.1	7.4	7.3
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	2	2	< 1	< 1	2	2	1	< 1
Barium	ug/L	2,000	130	131	202	214	200	212	401	356
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	1,020	< 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	49	52	46	38	53	48	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	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NA		< 0.531		< 0.239		0.399		0.406
Radium-228	pCi/L	NA		0.503		0.455		0.979		< 0.518
Radium-226/228	pCi/L	5.0		0.823		0.684		1.38		0.824
Selenium	ug/L	50	< 1	< 1	< 1	2	3	< 1	3	1
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters (2)	)									
Iron	ug/L	28,000	1,510	1,560	1,180	1,420	2,380	1,760	1,130	1,060
Copper	ug/L	1,000	1	2	2	< 1	< 1	< 1	< 1	1
Nickel	ug/L	100	< 2	< 2	< 2	< 2	6	10	< 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	< 30	< 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.

July 2022

### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:	MW-53R									
		Sample Date:	8/11/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022		
Constituent	Unit	GWPS										
Appendix III <sup>(1)</sup>												
Boron	ug/L	560	1,540	1,780	1,510	1,580	1,710	2,060	2,330	1,830		
Calcium	mg/L	280	239	246	234	227	203	232	188	226		
Chloride	mg/L	2,300	45.0	31.8	32.5	31.1	34.5	36.6	39.9	41.6		
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	275	196	227	170	189	166	71.7	314		
Total Dissolved Solids	mg/L	4,700	1,220	1,100	1,140	1,040	1,040	1,060	709	1,290		
pH, Field	SU	6.5 - 8.5	6.8	7.0	6.8	6.8	6.8	6.8	7.1	6.9		
Appendix IV <sup>(1)</sup>												
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Arsenic	ug/L	21	31	40	19	18	23	25	10	8		
Barium	ug/L	2,000	208	242	202	208	204	189	203	147		
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	71	66	64	59	56	57	56	61		
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				0.306		0.344		< 0.325		
Radium-228	pCi/L	NA				0.822		1.05		< 0.480		
Radium-226/228	pCi/L	5.0				1.13		1.40		< 0.480		
Selenium	ug/L	50	< 1	1	< 1	< 1	2	3	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	2,020	2,140	971	2,220	2,800	2,170	1,080	460		
Copper	ug/L	1,000	3	1	2	1	1	< 1	2	2		
Nickel	ug/L	100	< 2	< 2	< 2	< 2	10	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	< 30	< 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.

July 2022

### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:	MW-54R									
		Sample Date:	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/11/2021	3/9/2022	5/9/2022		
Constituent	Unit	GWPS										
Appendix III <sup>(1)</sup>												
Boron	ug/L	560	1,660	1,660	2,470	3,140	3,530	4,270	4,720	4,110		
Calcium	mg/L	280	168	174	178	196	163	187	186	169		
Chloride	mg/L	2,300	18.5	23.9	28.0	32.7	35.5	34.7	49.8	35.8		
Fluoride	ug/L	4,000	< 1,000	1,800	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000		
Sulfate	mg/L	780	96.2	100	79.9	72.7	77.0	75.7	67.1	86.3		
Total Dissolved Solids	mg/L	4,700	743	743	763	762	786	772	776	712		
pH, Field	SU	6.5 - 8.5	6.9	7.1	6.9	6.6	6.8	6.9	6.9	7.0		
Appendix IV <sup>(1)</sup>												
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Arsenic	ug/L	21	3	3	1	1	2	4	1	< 1		
Barium	ug/L	2,000	104	103	118	122	124	129	154	111		
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	2		
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6		
Fluoride	ug/L	4,000	< 1,000	1,800	< 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	57	66	64	60	59	74	64		
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	7	7	9		
Radium-226	pCi/L	NA		< 0.334		< 0.255		< 0.231		< 0.347		
Radium-228	pCi/L	NA		< 0.504		0.782		0.759		< 0.552		
Radium-226/228	pCi/L	5.0		0.546		0.900		0.965		< 0.552		
Selenium	ug/L	50	< 1	< 1	< 1	< 1	1	2	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	1,170	1,030	115	782	1,190	2,280	496	121		
Copper	ug/L	1,000	< 1	1	1	2	1	< 1	1	1		
Nickel	ug/L	100	6	4	< 2	3	9	< 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	< 30	< 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.

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				MW	<i>I</i> -55			
		Sample Date:	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	5/10/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	592	705	593	866	873	788	826	642
Calcium	mg/L	280	178	170	151	147	126	198	163	177
Chloride	mg/L	2,300	16.7	18.0	16.7	19.5	19.3	16.5	20.2	11.8
Fluoride	ug/L	4,000	< 1,000	1,220	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	104	84.0	48.0	18.5	34.3	80.7	35.4	249
Total Dissolved Solids	mg/L	4,700	844	826	794	729	743	844	808	942
pH, Field	SU	6.5 - 8.5	7.1	7.2	7.1	7.1	7.1	7.0	7.1	7.0
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	107	123	152	169	204	198	88	48
Barium	ug/L	2,000	250	223	366	323	347	330	299	222
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	1,220	< 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	33	28	24	25	34	28	24
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	207	179	166	131	157	206	89	78
Radium-226	pCi/L	NA		< 0.447		0.525		0.467		< 0.478
Radium-228	pCi/L	NA		0.566		0.896		1.10		< 0.646
Radium-226/228	pCi/L	5.0		0.798	1	1.42		1.56		0.696
Selenium	ug/L	50	2	1	< 1	1	1	2	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	21,300	21,800	23,500	21,500	39,400	40,500	29,800	15,000
Copper	ug/L	1,000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Nickel	ug/L	100	< 2	< 2	< 2	< 2	6	8	4	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	< 30	< 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.

July 2022

#### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				OW-57	'R OUT			
		Sample Date:	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/9/2022	5/10/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,510	1,730	1,660	1,710	1,730	1,880	2,030	1,990
Calcium	mg/L	280	132	144	128	133	118	140	126	131
Chloride	mg/L	2,300	53.9	49.4	59.0	62.9	53.1	46.9	62.5	57.3
Fluoride	ug/L	4,000	< 1,000	1,830	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	96.8	109	86.0	78.3	93.9	93.1	83.1	69.4
Total Dissolved Solids	mg/L	4,700	658	782	761	743	725	737	1,030	702
pH, Field	SU	6.5 - 8.5	7.0	7.1	7.2	7.0	7.0	7.0	7.2	7.1
Appendix IV <sup>(1)</sup>										
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	77	73	70	73	72	75	85	79
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	2
Cobalt	ug/L	15	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	< 1,000	1,830	< 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	27	24	26	24	20	21	26	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	7	8	7	6	7	9	8	7
Radium-226	pCi/L	NA		< 0.324		< 0.286		< 0.227		< 0.440
Radium-228	pCi/L	NA		< 0.463		0.606		1.12		< 0.539
Radium-226/228	pCi/L	5.0		0.499		0.615		1.26		< 0.539
Selenium	ug/L	50	< 1	< 1	< 1	< 1	< 1	2	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	42	92	46	100	56	68	96	74
Copper	ug/L	1,000	2	2	2	1	2	1	2	2
Nickel	ug/L	100	16	14	15	16	21	12	17	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	< 2
Zinc	ug/L	2,400	< 30	16	< 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.

#### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				JCW-M\	W-18001			
		Sample Date:	8/10/2020	10/13/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/7/2022	5/9/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	1,310	1,370	1,350	1,340	1,610	1,670	1,670	1,560
Calcium	mg/L	280	237	282	270	305	348	373	412	335
Chloride	mg/L	2,300	70.8	73.8	72.1	77.3	76.4	68.3	60.0	58.8
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	357	435	549	580	700	777	1,080	752
Total Dissolved Solids	mg/L	4,700	1,370	1,370	1,610	1,670	1,880	2,000	2,310	1,970
pH, Field	SU	6.5 - 8.5	6.9	7.1	6.9	6.9	6.9	6.8	6.8	7.0
Appendix IV <sup>(1)</sup>										
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	3	3	2	2	38	1	< 1	< 1
Barium	ug/L	2,000	261	273	213	166	199	184	129	80
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	8	< 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	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	2	< 1	< 1	< 1
Lithium	ug/L	180	69	66	69	68	71	103	87	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	< 5	< 5	< 5	< 5	9	< 5	< 5	< 5
Radium-226	pCi/L	NA		< 0.423		< 0.378		0.337		< 0.327
Radium-228	pCi/L	NA		0.616		< 0.558		1.05		0.494
Radium-226/228	pCi/L	5.0		1.03		< 0.558		1.39		0.586
Selenium	ug/L	50	< 1	< 1	< 1	< 1	2	3	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	202	182	183	154	13,600	91	86	210
Copper	ug/L	1,000	1	1	2	3	6	2	2	3
Nickel	ug/L	100	< 2	2	8	2	16	20	6	8
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	12	< 2	< 2	< 2
Zinc	ug/L	2,400	< 30	< 10	< 10	< 10	12	< 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.

July 2022

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:				JCW-M\	N-18004			
		Sample Date:	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	5/10/2022
Constituent	Unit	GWPS								
Appendix III <sup>(1)</sup>										
Boron	ug/L	560	347	410	232	246	304	389	259	226
Calcium	mg/L	280	306	323	252	266	203	264	236	235
Chloride	mg/L	2,300	25.6	22.6	17.9	12.4	6.65	7.45	19.6	10.8
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	718	756	581	523	393	493	537	512
Total Dissolved Solids	mg/L	4,700	1,820	1,690	1,390	1,270	1,180	1,240	1,280	1,290
pH, Field	SU	6.5 - 8.5	6.7	6.9	6.9	6.8	6.8	6.8	6.9	6.8
Appendix IV <sup>(1)</sup>										
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	36	34	20	27	36	41	32	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	39	37	35	36	47	63	34	42
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		< 0.424		< 0.271		0.182		< 0.417
Radium-228	pCi/L	NA		1.04		< 0.425		0.796		0.790
Radium-226/228	pCi/L	5.0		0.922		< 0.425		0.978		0.910
Selenium	ug/L	50	< 1	< 1	7	1	4	3	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	< 20	< 20	21	24	< 20	39	952	< 20
Copper	ug/L	1,000	2	3	3	2	1	2	1	2
Nickel	ug/L	100	< 2	4	< 2	2	9	16	4	< 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	< 30	< 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.

#### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:					JCW-MW-1800	5			
		Sample Date:	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	3/7/2022	5/10/2022
Constituent	Unit	GWPS									
Appendix III <sup>(1)</sup>										Field Dup	
Boron	ug/L	560	1,100	1,090	987	919	1,080	1,190	1,030	1,100	1,010
Calcium	mg/L	280	259	195	286	202	149	193	159	164	280
Chloride	mg/L	2,300	63.9	66.5	43.7	56.0	64.9	63.6	61.7	60.7	32.6
Fluoride	ug/L	4,000	< 1,000	1,640	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	780	398	185	535	263	190	227	204	211	437
Total Dissolved Solids	mg/L	4,700	1,310	986	1,420	1,020	895	1,020	942	934	1,330
pH, Field	SU	6.5 - 8.5	6.9	7.0	6.8	6.9	7.0	6.9	7.1		6.8
Appendix IV <sup>(1)</sup>											
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	8	8	7	9	9	9	5	5	5
Barium	ug/L	2,000	87	98	135	93	98	124	108	110	110
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	1,640	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	4.0	< 1	< 1	< 1	< 1	2	< 1	< 1	< 1	< 1
Lithium	ug/L	180	45	33	39	30	28	39	32	30	33
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	< 5	< 5	< 5	< 5	< 5	< 5	5	5	6
Radium-226	pCi/L	NA		1.07		< 0.224		< 0.262			< 0.414
Radium-228	pCi/L	NA		0.540		0.524		0.984			< 0.521
Radium-226/228	pCi/L	5.0		1.61		0.728		1.16			0.622
Selenium	ug/L	50	< 1	< 1	< 1	1	2	4	3	3	2
Thallium	ug/L	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
MI Part 115 Parameters	2)										
Iron	ug/L	28,000	4,900	3,550	4,800	4,590	5,350	5,840	3,300	3,170	1,680
Copper	ug/L	1,000	2	1	2	1	12	1	< 1	< 1	2
Nickel	ug/L	100	9	11	8	10	29	22	10	25	< 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	< 30	< 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.

- 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.

#### Comparison of Groundwater Sampling Results to Groundwater Protection Standards – August 2020 to May 2022 JC Weadock Landfill – Hydrogeological Monitoring Program Essexville, Michigan

		Sample Location:					JCW-MW-1800	16			
		Sample Date:	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	5/9/2022	5/9/2022
Constituent	Unit	GWPS									
Appendix III <sup>(1)</sup>											Field Dup
Boron	ug/L	560	2,040	2,610	2,650	2,720	2,640	2,600	3,220	2,990	3,030
Calcium	mg/L	280	148	167	148	147	135	152	143	136	136
Chloride	mg/L	2,300	76.1	72.2	66.1	72.6	73.6	77.0	75.0	67.3	67.7
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	31.2	50.1	57.3	47.0	29.7	34.7	38.1	32.8	34.0
Total Dissolved Solids	mg/L	4,700	820	861	823	784	769	802	792	788	772
pH, Field	SU	6.5 - 8.5	7.0	7.1	6.9	6.9	6.9	7.0	7.1	7.0	
Appendix IV <sup>(1)</sup>											
Antimony	ug/L	6.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	21	12	22	30	30	25	21	33	22	23
Barium	ug/L	2,000	361	489	477	472	492	351	665	514	509
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	41	59	58	53	46	47	63	56	57
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	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	< 5
Radium-226	pCi/L	NA		0.716		0.418		0.268		< 0.416	
Radium-228	pCi/L	NA		0.853		< 0.483		0.872		< 0.518	
Radium-226/228	pCi/L	5.0		1.57		0.888		1.14		0.690	
Selenium	ug/L	50	< 1	< 1	< 1	1	2	4	2	< 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	3,360	5,760	5,730	5,490	7,790	6,200	9,040	6,600	6,360
Copper	ug/L	1,000	< 1	< 1	< 1	2	< 1	< 1	< 1	1	< 1
Nickel	ug/L	100	2	< 2	3	3	6	10	6	< 2	< 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	3	3	3	4	2	4	3	3
Zinc	ug/L	2,400	< 30	< 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.

- 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 – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program

Essexville, Michigan

					Sample Location:	<u> </u>							MW-50							
						0/40/0000	0/40/0000	40/40/0000	0/0/0004	0/0/0004	F/40/0004	5/40/0004		0/0/0004	40/44/0004	40/44/0004	0/0/0000	0/0/0000	F /0 /0000	F /0/0000
					Sample Date:	8/10/2020	8/10/2020	10/13/2020	3/8/2021	3/8/2021	5/10/2021	5/10/2021	8/2/2021	8/2/2021	10/11/2021	10/11/2021	3/8/2022	3/8/2022	5/9/2022	5/9/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**															
Appendix III <sup>(1)</sup>							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	1,430	1,360	1,470	1,510	1,610	1,380	1,320	1,520	1,630	1,830	1,900	1,610	1,620	1,360	1,440
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	1,020	1,040	990	1,130	1,120	856	867	638	634	496	512	346	330	285	286
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.0		7.1	6.9	-	6.9		7.0		7.1	-	7.4		7.2	
Appendix IV <sup>(1)</sup>																				
Arsenic	ug/L	10	100	680	100	2	2	3	1	1	1	1	2	2	3	3	2	2	1	1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	1	1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	1	1
Lithium	ug/L	440	NC	NC	440	111	115	100	126	128	100	100	79	81	93	68	77	77	69	66
Molybdenum	ug/L	120	NC	NC	120	7	8	7	< 5	< 5	< 5	< 5	< 5	< 5	< 5	6	6	6	< 5	< 5
Selenium	ug/L	50	55	120	55	< 1	< 1	1	1	1	< 1	1	3	2	4	4	2	2	2	2
MI Part 115 Parame	eters <sup>(2)</sup>				_				-											
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	2,280	2,230	2,990	2,100	2,190	1,810	1,810	3,000	2,780	2,500	2,710	1,400	1,180	723	737
Vanadium	ug/L	27	NC	NC	27	< 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.
- $^{\star\star}$  GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.
- F Criterion is the Final Acute Value (FAV) .
- $^{\rm H}$  Chromium GSI criterion based on hexavalent chromium per footnote {H}.
- $^{\mbox{\scriptsize EE}}$  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) additional assessment monitoring constituents (vanadium and zinc) are reported.

TRC | Consumers Energy X:\WPAAMPJT2\464096\0000\2022\Q2\T464096.0-Appx D3

Page 1 of 8 July 2022

#### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:					MW-51				
					Sample Date:	8/10/2020	10/14/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**									
Appendix III <sup>(1)</sup>								Field Dup						
Boron	ug/L	4,000	44,000	69,000	44,000	758	739	798	1,040	1,040	960	1,140	1,420	1,350
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	556	522	537	452	450	434	418	446	420
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.8	6.8		7.0	7.0	6.9	6.9	7.4	7.2
Appendix IV <sup>(1)</sup>														
Arsenic	ug/L	10	100	680	100	12	17	17	11	11	14	20	12	10
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	57	51	55	62	57	47	64	58	56
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	< 1	< 1	< 1	1	< 1	1	3	3	2
MI Part 115 Paramet	ters <sup>(2)</sup>	<u> </u>			_						_		_	
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	4,390	5,400	5,600	1,940	2,200	5,080	5,130	1,310	1,210
Vanadium	ug/L	27	NC	NC	27	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

July 2022

#### 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.
- $^{\star\star}$  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}.
- $^{\mbox{\scriptsize EE}}$  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) additional assessment monitoring constituents (vanadium and zinc) are reported.

 TRC | Consumers Energy
 Y:\WPAAMPJT2\464096\0000012022\Q2\17464096.0-Appx D3
 Page 2 of 8

#### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW	-52			
					Sample Date:	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	1,200	1,110	1,120	1,160	1,140	1,280	1,310	1,090
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	586	572	531	574	501	110	654	591
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.9	7.0	7.0	6.9	6.9	6.9	7.1	7.0
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	38	33	31	29	21	31	27	25
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	< 1	1	1	1	1	3	2	2
MI Part 115 Paramet	ers <sup>(2)</sup>									-			
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	2,720	4,770	879	1,400	3,830	4,880	2,870	2,030
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.
- mixing zone GSI Cineria nom michigan bepartment of Environmental Quality (widey) approvarietter dated becember
- $^{\star\star}$  GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.
- F Criterion is the Final Acute Value (FAV) .
- $^{\rm H}$  Chromium GSI criterion based on hexavalent chromium per footnote {H}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

TRC | Consumers Energy X:\WPAAMPJT2\464096\0000\2022\Q2\T464096.0-Appx D3

Page 3 of 8 July 2022

### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW	<b>'-53</b>			
					Sample Date:	8/10/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	2,760	2,720	3,920	3,790	3,820	3,820	4,100	3,880
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	321	269	317	322	279	111	39.5	215
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.0	7.2	7.1	7.1	7.1	7.1	7.4	7.3
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	2	2	< 1	< 1	2	2	1	< 1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	440	NC	NC	440	53	49	52	46	38	53	48	41
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	< 1	< 1	< 1	2	3	< 1	3	1
MI Part 115 Paramet	ers <sup>(2)</sup>												
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	1,510	1,560	1,180	1,420	2,380	1,760	1,130	1,060
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}.

 $^{\mbox{\scriptsize EE}}$  - 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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

#### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW-	-53R			
					Sample Date:	8/11/2020	10/14/2020	3/8/2021	5/10/2021	8/2/2021	10/11/2021	3/8/2022	5/9/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	1,540	1,780	1,510	1,580	1,710	2,060	2,330	1,830
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	275	196	227	170	189	166	71.7	314
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.8	7.0	6.8	6.8	6.8	6.8	7.1	6.9
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	31	40	19	18	23	25	10	8
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	440	NC	NC	440	71	66	64	59	56	57	56	61
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Selenium	ug/L	50	55	120	55	< 1	1	< 1	< 1	2	3	2	2
MI Part 115 Paramet	ters <sup>(2)</sup>							-					
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	2,020	2,140	971	2,220	2,800	2,170	1,080	460
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) .

 $^{\rm H}$  - Chromium GSI criterion based on hexavalent chromium per footnote {H}.

 $^{\mbox{\scriptsize EE}}$  - 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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

Page 5 of 8 July 2022

#### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW-	-54R			
					Sample Date:	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/11/2021	3/8/2022	5/9/2022
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**								
Appendix III <sup>(1)</sup>													
Boron	ug/L	4,000	44,000	69,000	44,000	1,660	1,660	2,470	3,140	3,530	4,270	4,720	4,110
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	96.2	100	79.9	72.7	77.0	75.7	67.1	86.3
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.9	7.1	6.9	6.6	6.8	6.9	6.9	7.0
Appendix IV <sup>(1)</sup>													
Arsenic	ug/L	10	100	680	100	3	3	1	1	2	4	1	< 1
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2
Lithium	ug/L	440	NC	NC	440	61	57	66	64	60	59	74	64
Molybdenum	ug/L	120	NC	NC	120	5	5	< 5	< 5	< 5	7	7	9
Selenium	ug/L	50	55	120	55	< 1	< 1	< 1	< 1	1	2	2	2
MI Part 115 Paramet	ers <sup>(2)</sup>									-		·	
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	1,170	1,030	115	782	1,190	2,280	496	121
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}.
- $^{\mbox{\scriptsize EE}}$  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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

TRC | Consumers Energy X:\WPAAMPJT2\464096\0000\2022\Q2\T464096.0-Appx D3

Page 6 of 8 July 2022

### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				MW	<i>l</i> -55		826 642 35.4 249							
					Sample Date:	8/11/2020	10/14/2020	3/9/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	5/10/2022						
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**														
Appendix III <sup>(1)</sup>																			
Boron	ug/L	4,000	44,000	69,000	44,000	592	705	593	866	873	788	826	642						
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	104	84.0	48.0	18.5	34.3	80.7	35.4	249						
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	7.1	7.2	7.1	7.1	7.1	7.0	7.1	7.0						
Appendix IV <sup>(1)</sup>																			
Arsenic	ug/L	10	100	680	100	107	123	152	169	204	198	88	48						
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1						
Lithium	ug/L	440	NC	NC	440	33	33	28	24	25	34	28	24						
Molybdenum	ug/L	120	NC	NC	120	207	179	166	131	157	206	89	78						
Selenium	ug/L	50	55	120	55	2	1	< 1	1	1	2	1	3						
MI Part 115 Paramet	ers <sup>(2)</sup>																		
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	21,300	21,800	23,500	21,500	39,400	40,500	29,800	15,000						
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}.

 $^{\mbox{\scriptsize EE}}$  - 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) additional

assessment monitoring constituents (vanadium and zinc) are reported.

Page 7 of 8 July 2022

#### Comparison of Groundwater Sampling Results to GSI – August 2020 to May 2022 JC Weadock Landfill – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:				JCW-MV	V-18004		389 259 226 493 537 512 6.8 6.9 6.8							
					Sample Date:	8/11/2020	10/14/2020	3/8/2021	5/11/2021	8/3/2021	10/12/2021	3/7/2022	5/10/2022						
Constituent	Unit	Generic GSI^	Chronic-Based Mixing Zone GSI Criteria*	Acute-Based Mixing Zone GSI Criteria*	GSI**														
Appendix III <sup>(1)</sup>																			
Boron	ug/L	4,000	44,000	69,000	44,000	347	410	232	246	304	389	259	226						
Sulfate	mg/L	1,200 <sup>F</sup>	NC	NC	1,200	718	756	581	523	393	493	537	512						
pH, Field	SU	6.5-9.0	NC	NC	6.5-9.0	6.7	6.9	6.9	6.8	6.8	6.8	6.9	6.8						
Appendix IV <sup>(1)</sup>																			
Arsenic	ug/L	10	100	680	100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1						
Chromium	ug/L	11 <sup>H</sup>	NC	NC	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1						
Lithium	ug/L	440	NC	NC	440	39	37	35	36	47	63	34	42						
Molybdenum	ug/L	120	NC	NC	120	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5						
Selenium	ug/L	50	55	120	55	< 1	< 1	7	1	4	3	2	2						
MI Part 115 Paramet	ers <sup>(2)</sup>																		
Iron	ug/L	500,000 <sup>EE</sup>	NC	NC	500,000	< 20	< 20	21	24	< 20	39	952	< 20						
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.
- withing 2016 Got Official from withingan bepartment of Environmental addality (wibEq) approval letter dated becember 2.
- $^{\star\star}$  GSI criteria is the generic GSI criteria or the Chronic-Based Mixing Zone criteria, if applicable.
- F Criterion is the Final Acute Value (FAV) .
- $^{\rm H}$  Chromium GSI criterion based on hexavalent chromium per footnote {H}.
- $^{\mbox{\scriptsize EE}}$  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) additional

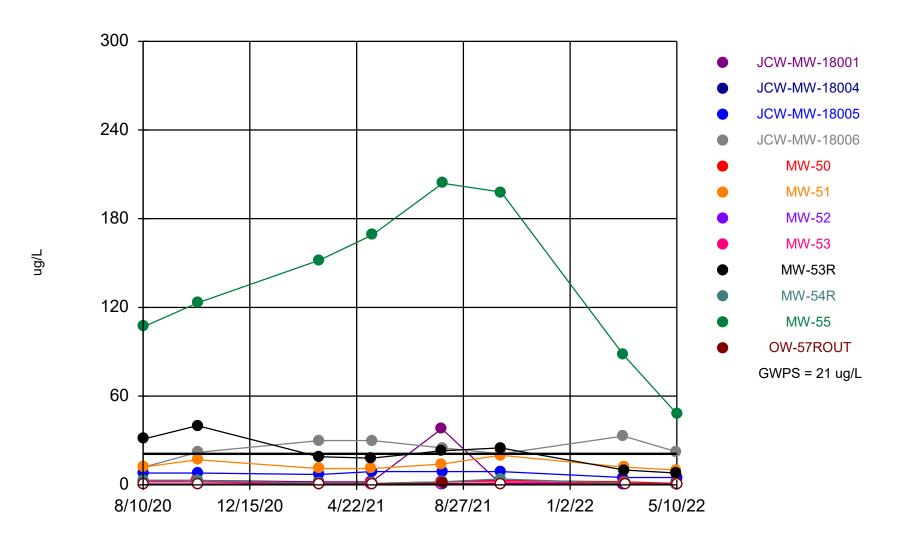
assessment monitoring constituents (vanadium and zinc) are reported.

TRC | Consumers Energy X:\WPAAMPJT2\464096\0000\2022\Q2\T464096.0-Appx D3

Page 8 of 8 July 2022

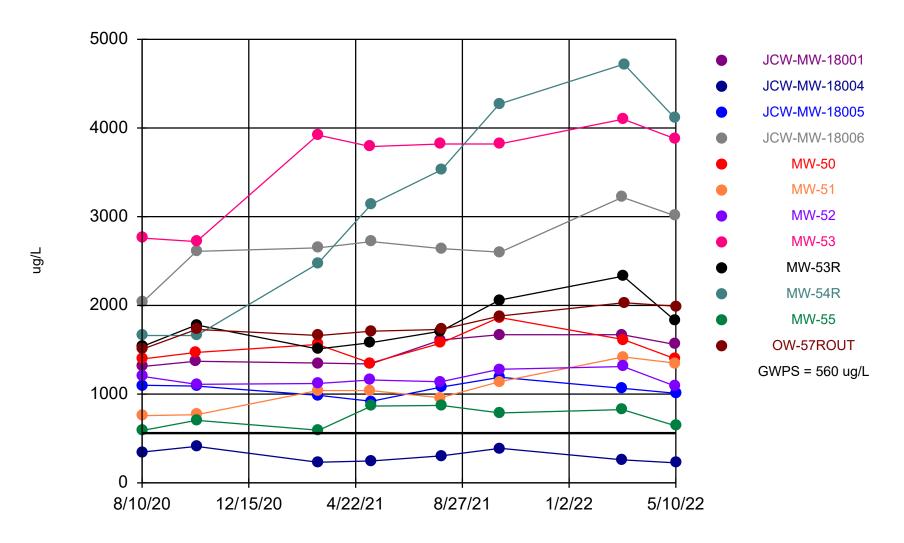
# Attachment 1 Assessment Monitoring Sanitas<sup>™</sup> Output Files

### Arsenic Comparison to GWPS



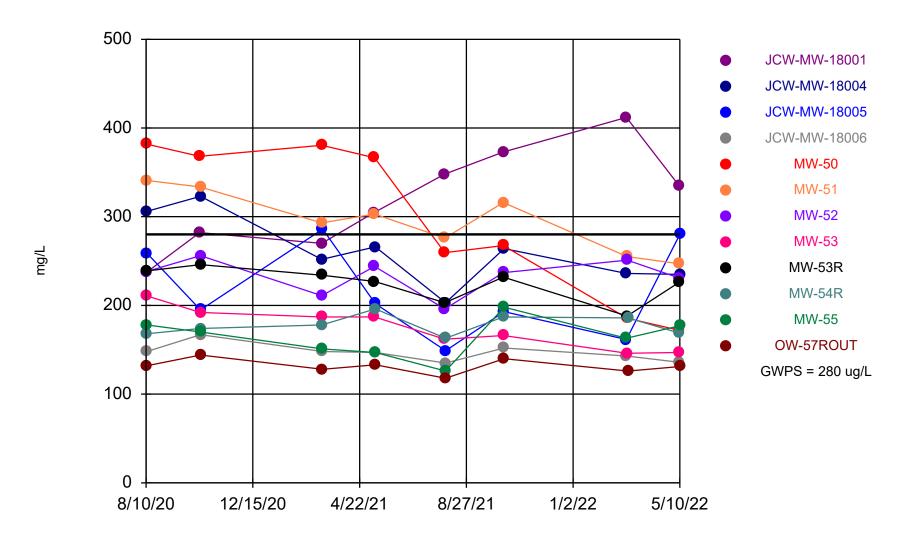
Time Series Analysis Run 6/8/2022 2:02 PM

### Boron Comparison to GWPS



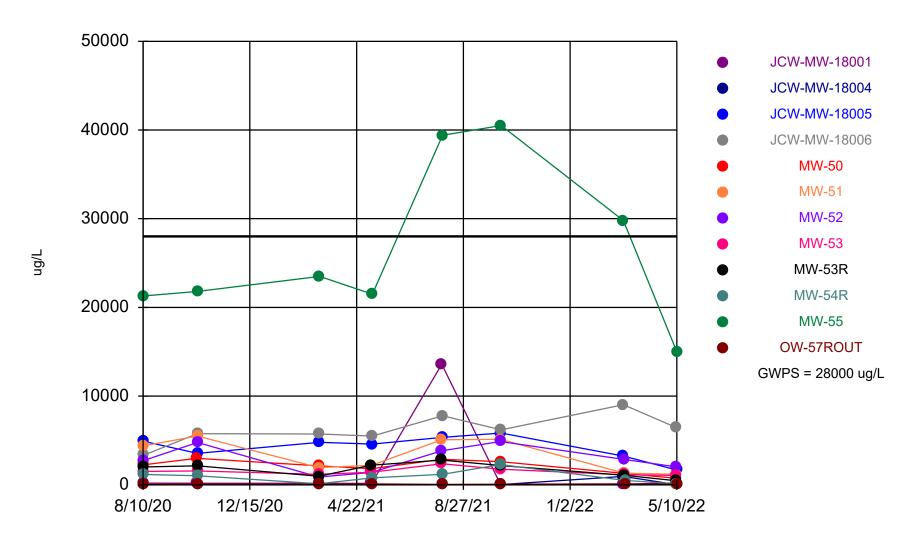
Time Series Analysis Run 6/8/2022 2:05 PM

### Calcium Comparison to GWPS



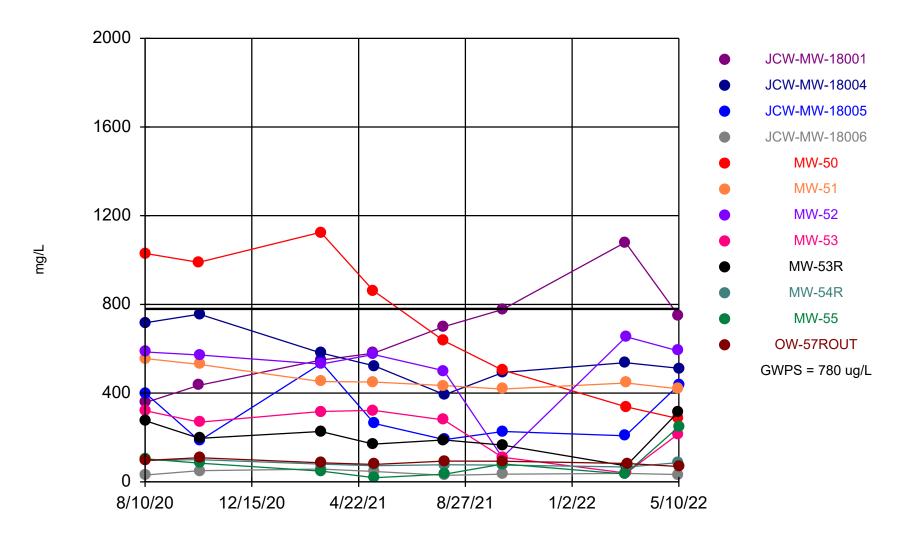
Time Series Analysis Run 6/8/2022 2:06 PM

### Iron Comparison to GWPS



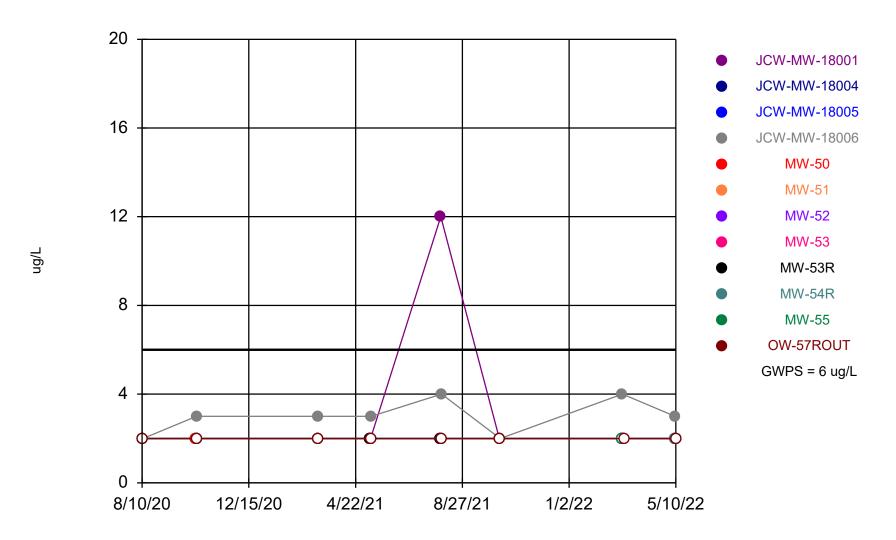
Time Series Analysis Run 6/8/2022 2:06 PM

### Sulfate Comparison to GWPS



Time Series Analysis Run 6/8/2022 2:07 PM

### Vanadium Comparison to GWPS



Time Series Analysis Run 6/8/2022 2:08 PM

Constituent: Arsenic, Total Analysis Run 6/8/2022 2:10 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 28 Wells = 12 Minimum Value = 1 Maximum Value = 204 Mean Value = 18.16 Median Value = 2.5 Standard Deviation = 39.83 Coefficient of Variation = 2.193

Skewness = 3.357

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	<u>CV</u>	<u>Skewness</u>
JCW-MW-18001	8	2	1	38	6.375	2	12.81	2.009	2.249
JCW-MW-18004	8	8	1	1	1	1	0	0	NaN
JCW-MW-18005	8	0	5	9	7.5	8	1.69	0.2254	-0.6641
JCW-MW-18006	8	0	12	33	24.44	23.75	6.673	0.2731	-0.5212
MW-50	8	0	1	3	1.875	2	0.8345	0.4451	0.2217
MW-51	8	0	10	20	13.38	12	3.462	0.2588	0.9876
MW-52	8	7	1	1	1	1	0	0	NaN
MW-53	8	3	1	2	1.5	1.5	0.5345	0.3563	0
MW-53R	8	0	8	40	21.75	21	10.55	0.4852	0.3393
MW-54R	8	1	1	4	2	1.5	1.195	0.5976	0.5367
MW-55	8	0	48	204	136.1	137.5	54.6	0.4011	-0.2192
OW-57ROUT	8	7	1	1	1	1	0	0	NaN

Constituent: Boron, Total Analysis Run 6/8/2022 2:10 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 0 Wells = 12 Minimum Value = 226 Maximum Value = 4720 Mean Value = 1700 Median Value = 1490 Standard Deviation = 1034 Coefficient of Variation = 0.6081 Skewness = 1.035

Well	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	1310	1670	1485	1465	157.1	0.1058	0.1043
JCW-MW-18004	8	0	226	410	301.6	281.5	72.63	0.2408	0.4042
JCW-MW-18005	8	0	919	1190	1055	1073	82.24	0.07794	-0.08999
JCW-MW-18006	8	0	2040	3220	2686	2645	343.3	0.1278	-0.3211
MW-50	8	0	1350	1865	1529	1515	166.3	0.1088	0.9421
MW-51	8	0	758	1420	1060	1040	241.2	0.2276	0.2043
MW-52	8	0	1090	1310	1176	1150	80.88	0.06876	0.6815
MW-53	8	0	2720	4100	3601	3820	540.3	0.15	-1.04
MW-53R	8	0	1510	2330	1793	1745	282.2	0.1574	0.8538
MW-54R	8	0	1660	4720	3195	3335	1175	0.3679	-0.1902
MW-55	8	0	592	873	735.6	746.5	118	0.1604	-0.09511
OW-57ROUT	8	0	1510	2030	1780	1730	174.8	0.09818	0.1111

Constituent: Calcium, Total Analysis Run 6/8/2022 2:10 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 0 Wells = 12 Minimum Value = 118 Maximum Value = 412 Mean Value = 220.2 Median Value = 202.5 Standard Deviation = 71.2 Coefficient of Variation = 0.3234

Skewness = 0.7104

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	237	412	320.3	320	57.74	0.1803	0.1431
JCW-MW-18004	8	0	203	323	260.6	258	39	0.1496	0.2897
JCW-MW-18005	8	0	149	286	215.7	198.5	52.74	0.2445	0.225
JCW-MW-18006	8	0	135	167	147	147.5	10.06	0.06841	0.7513
MW-50	8	0	172	382	297.7	317	88.15	0.2961	-0.3656
MW-51	8	0	247	341	295.6	298	34.58	0.117	-0.116
MW-52	8	0	196	256	233	237.5	20.26	0.08693	-0.768
MW-53	8	0	146	211	174.8	176.5	23.14	0.1324	0.1056
MW-53R	8	0	188	246	224.4	229.5	19.35	0.08625	-0.9122
MW-54R	8	0	163	196	177.6	176	11.27	0.06348	0.3097
MW-55	8	0	126	198	163.8	166.5	22.23	0.1358	-0.2075
OW-57ROUT	8	0	118	144	131.5	131.5	8.071	0.06138	-0.02876

Constituent: Iron, Total Analysis Run 6/8/2022 2:10 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 4 Wells = 12 Minimum Value = 10 Maximum Value = 40500 Mean Value = 4301 Median Value = 1875 Standard Deviation = 7568 Coefficient of Variation = 1.76 Skewness = 3.155

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	0	86	13600	1839	182.5	4753	2.585	2.267
JCW-MW-18004	8	4	10	952	134.5	15.5	330.5	2.457	2.263
JCW-MW-18005	8	0	1680	5840	4243	4695	1347	0.3175	-0.7665
JCW-MW-18006	8	0	3360	9040	6231	5980	1675	0.2689	0.05366
MW-50	8	0	730	2990	2089	2200	785	0.3757	-0.5238
MW-51	8	0	1210	5500	3345	3295	1848	0.5526	-0.009059
MW-52	8	0	879	4880	2922	2795	1483	0.5076	0.08319
MW-53	8	0	1060	2380	1500	1465	428.5	0.2856	1.029
MW-53R	8	0	460	2800	1733	2080	796.6	0.4598	-0.3849
MW-54R	8	0	115	2280	898	906	704.9	0.785	0.7286
MW-55	8	0	15000	40500	26600	22650	9170	0.3447	0.5611
OW-57ROUT	8	0	42	100	71.75	71	22.71	0.3166	-0.02923

Constituent: Sulfate Analysis Run 6/8/2022 2:10 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 0 Wells = 12 Minimum Value = 18.5 Maximum Value = 1125 Mean Value = 329.2 Median Value = 272 Standard Deviation = 270.6 Coefficient of Variation = 0.822 Skewness = 0.8852

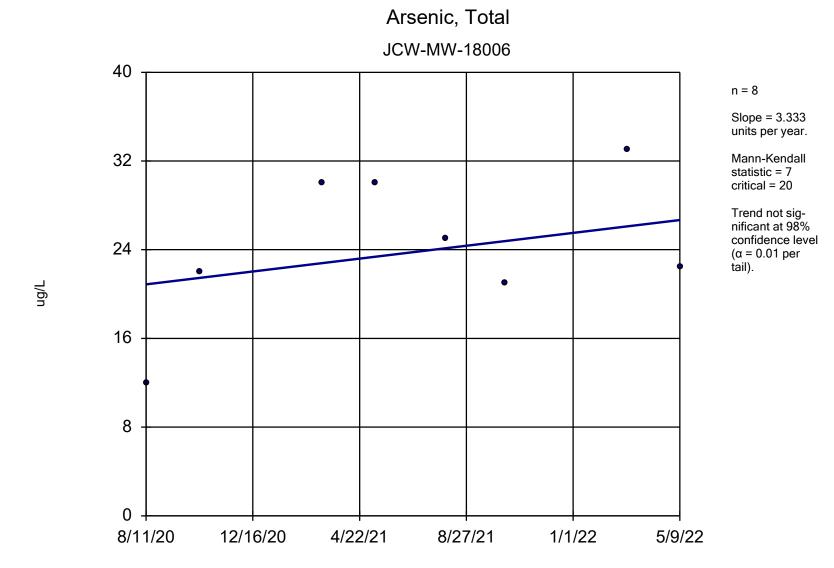
<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	Skewness
JCW-MW-18001	8	0	357	1080	653.8	640	227.1	0.3474	0.5505
JCW-MW-18004	8	0	393	756	564.1	530	119.7	0.2122	0.4553
JCW-MW-18005	8	0	185	535	305.3	245	133.1	0.4358	0.6761
JCW-MW-18006	8	0	29.7	57.3	40.19	36.4	10.06	0.2504	0.5898
MW-50	8	0	285.5	1125	721.3	748.8	325.5	0.4512	-0.1439
MW-51	8	0	418	556	463.2	448	51.22	0.1106	1.005
MW-52	8	0	110	654	514.9	573	169.6	0.3294	-1.956
MW-53	8	0	39.5	322	234.2	274	106.1	0.453	-0.9242
MW-53R	8	0	71.7	314	201.1	192.5	73.67	0.3664	-0.1453
MW-54R	8	0	67.1	100	81.86	78.45	11.47	0.1402	0.471
MW-55	8	0	18.5	249	81.74	64.35	73.69	0.9016	1.6
OW-57ROUT	8	0	69.4	109	88.7	89.55	12.21	0.1376	0.05148

Constituent: Vanadium, Total Analysis Run 6/8/2022 2:10 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 96 ND/Trace = 87 Wells = 12 Minimum Value = 2 Maximum Value = 12 Mean Value = 2.188 Median Value = 2 Standard Deviation = 1.069 Coefficient of Variation = 0.4888 Skewness = 8.293

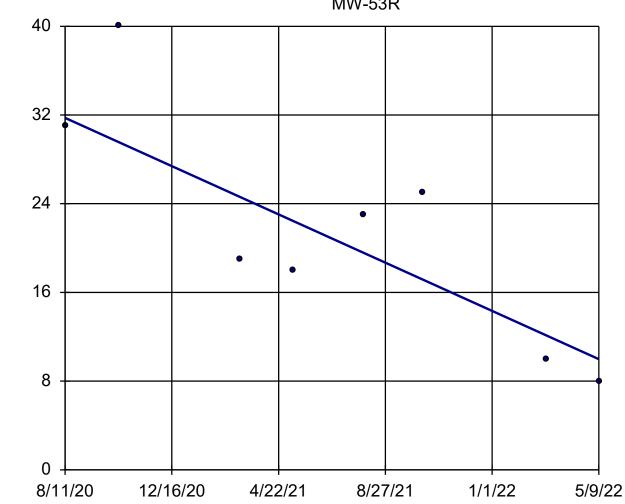
<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18001	8	6	2	12	3.25	2	3.536	1.088	2.268
JCW-MW-18004	8	8	2	2	2	2	0	0	NaN
JCW-MW-18005	8	8	2	2	2	2	0	0	NaN
JCW-MW-18006	8	1	2	4	3	3	0.7559	0.252	0
MW-50	8	8	2	2	2	2	0	0	NaN
MW-51	8	8	2	2	2	2	0	0	NaN
MW-52	8	8	2	2	2	2	0	0	NaN
MW-53	8	8	2	2	2	2	0	0	NaN
MW-53R	8	8	2	2	2	2	0	0	NaN
MW-54R	8	8	2	2	2	2	0	0	NaN
MW-55	8	8	2	2	2	2	0	0	NaN
OW-57ROUT	8	8	2	2	2	2	0	0	NaN



Sen's Slope Estimator Analysis Run 6/8/2022 2:47 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

### Arsenic, Total MW-53R



n = 8

Slope = -12.49 units per year.

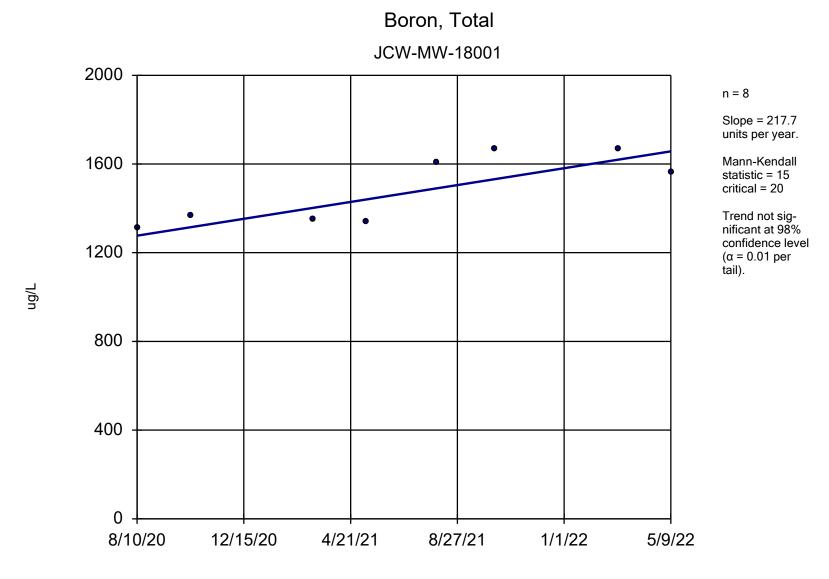
Mann-Kendall statistic = -16 critical = -20

Trend not significant at 98% confidence level ( $\alpha = 0.01$  per tail).

Sen's Slope Estimator Analysis Run 6/8/2022 2:47 PM

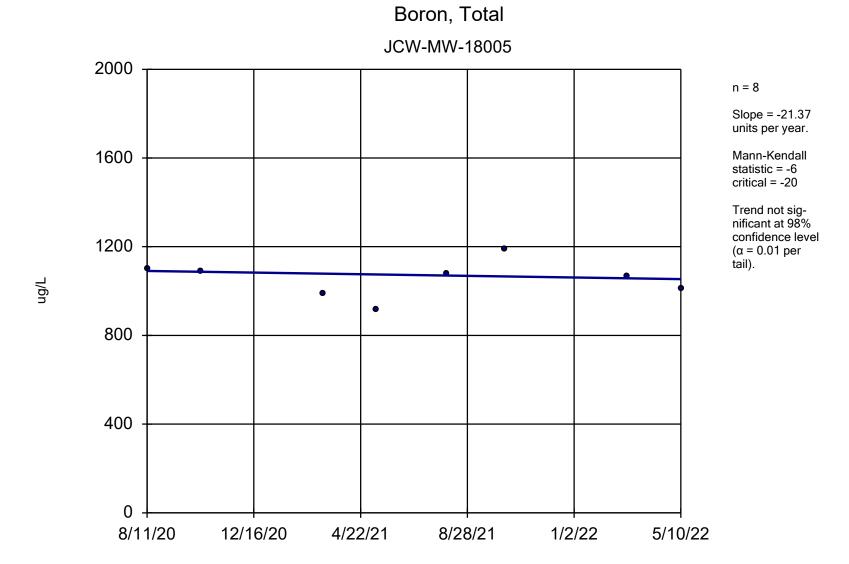
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

ng/L



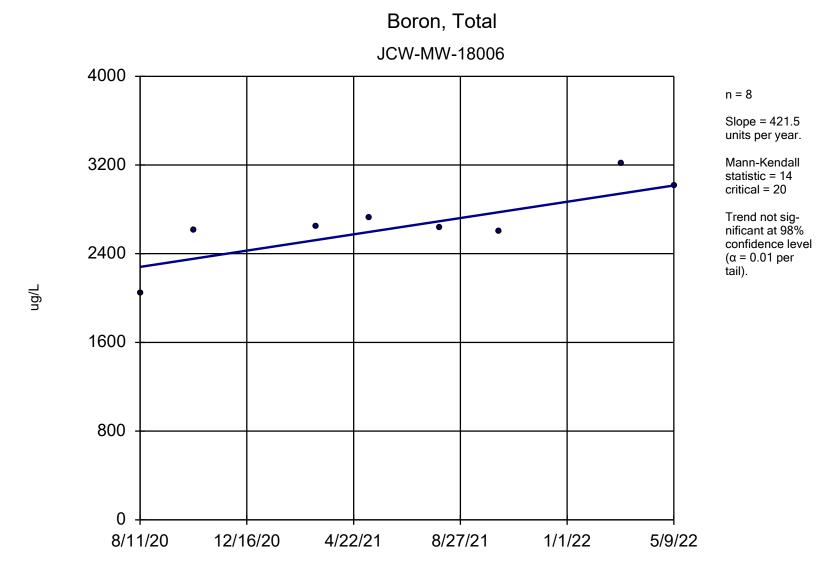
Sen's Slope Estimator Analysis Run 6/8/2022 2:47 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



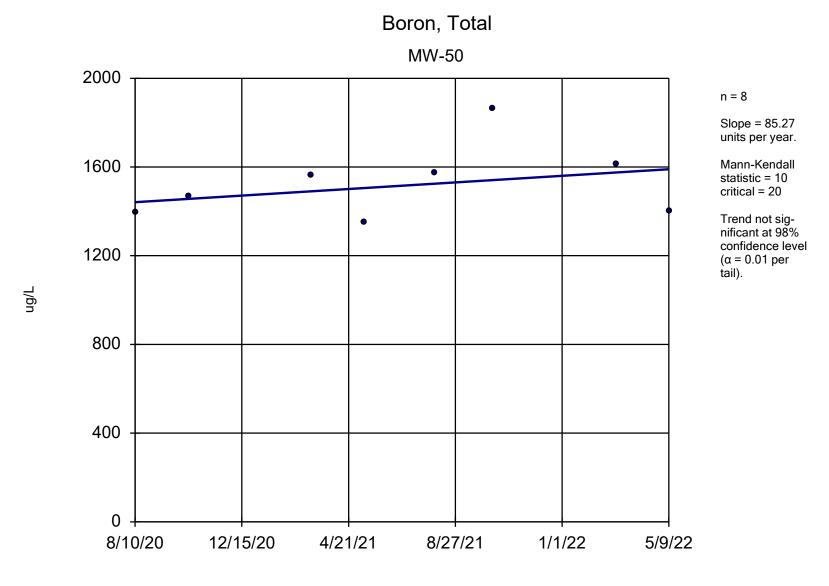
Sen's Slope Estimator Analysis Run 6/8/2022 2:47 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



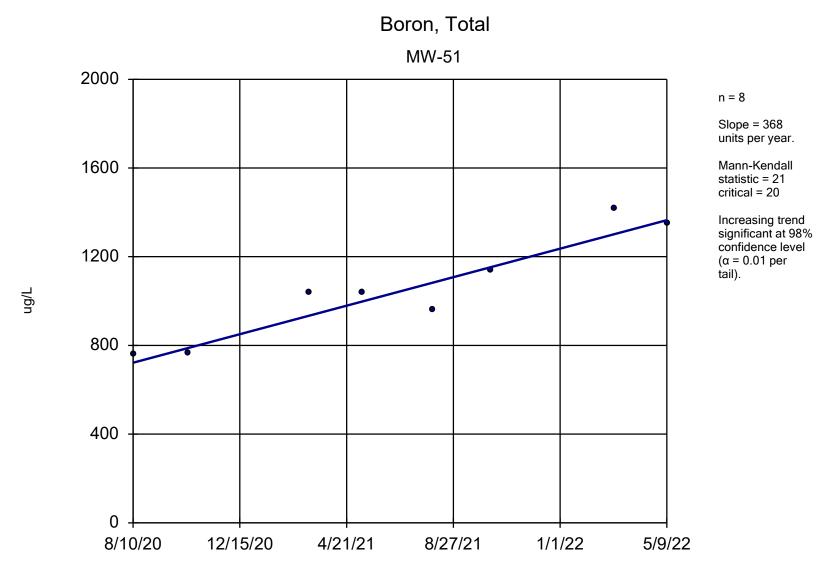
Sen's Slope Estimator Analysis Run 6/8/2022 2:47 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



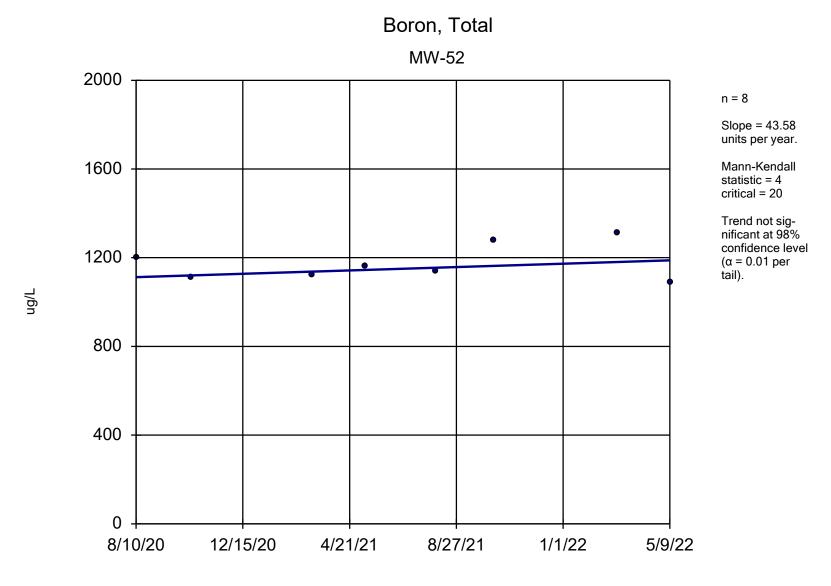
Sen's Slope Estimator Analysis Run 6/8/2022 2:47 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



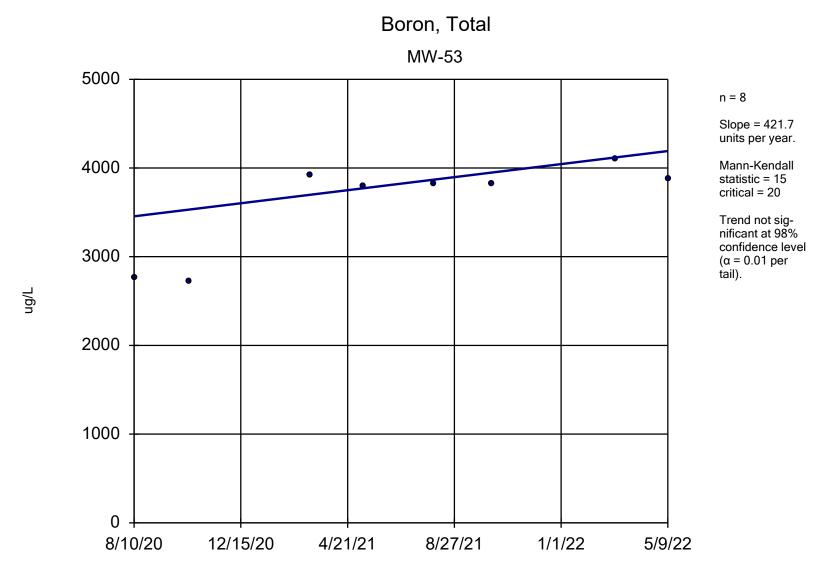
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



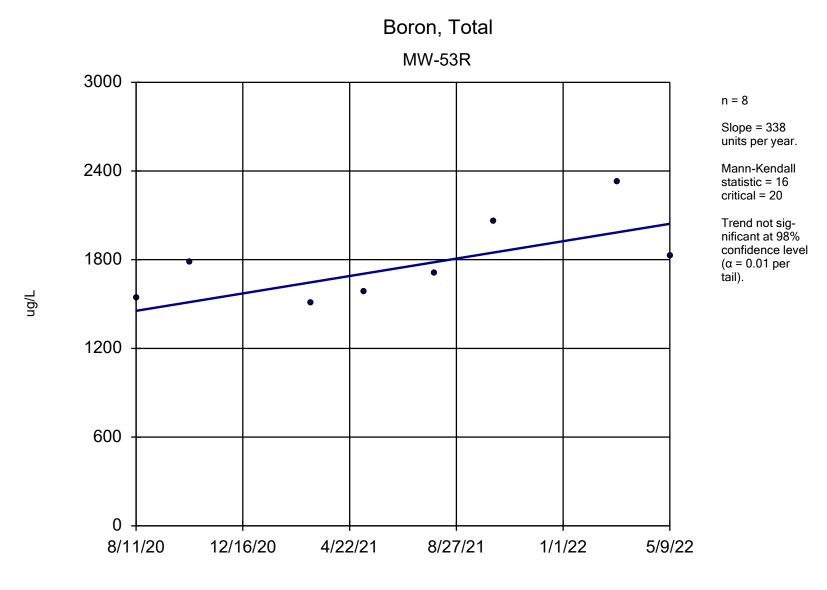
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



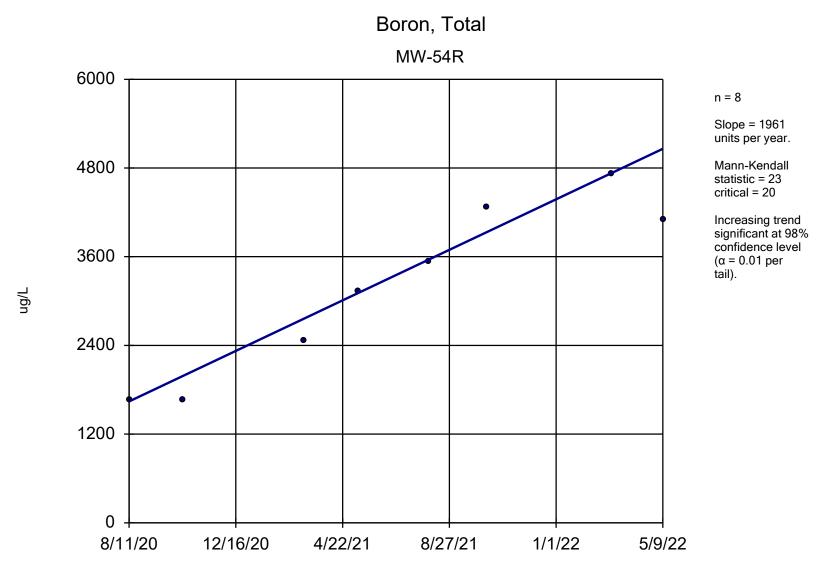
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



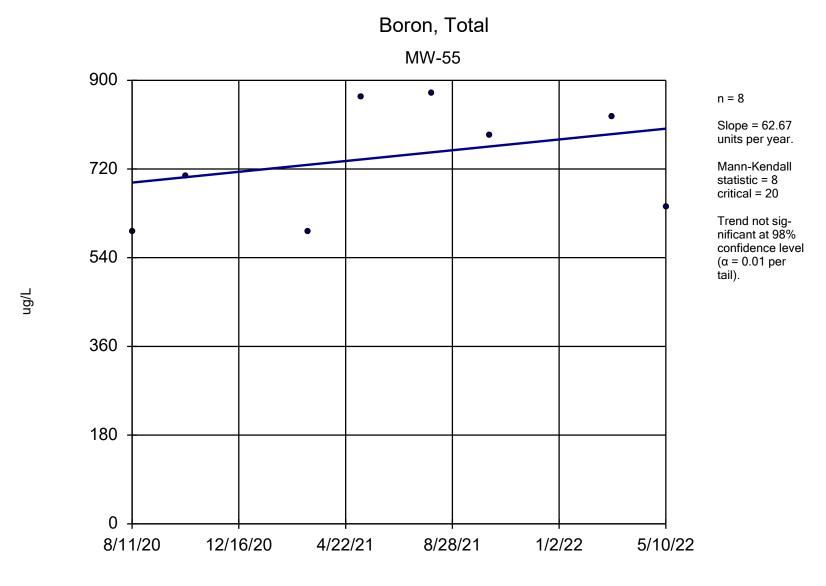
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



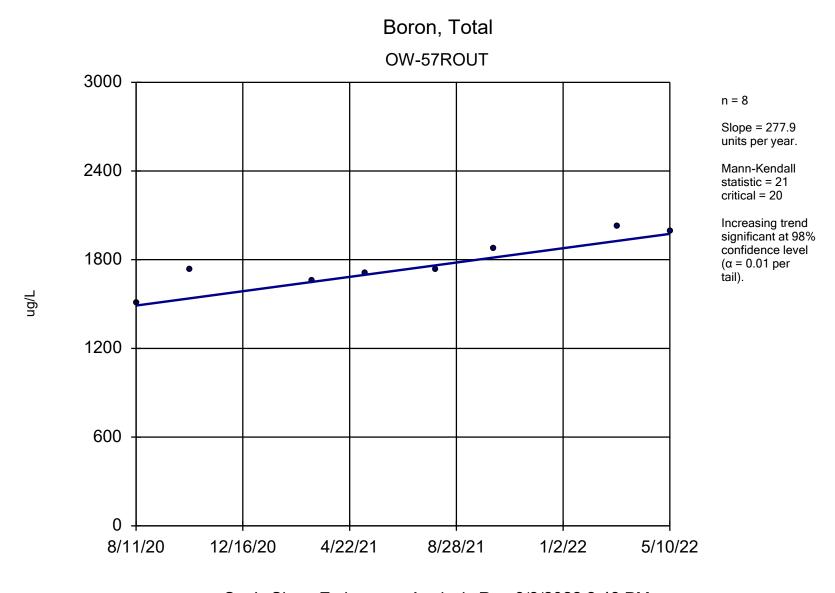
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



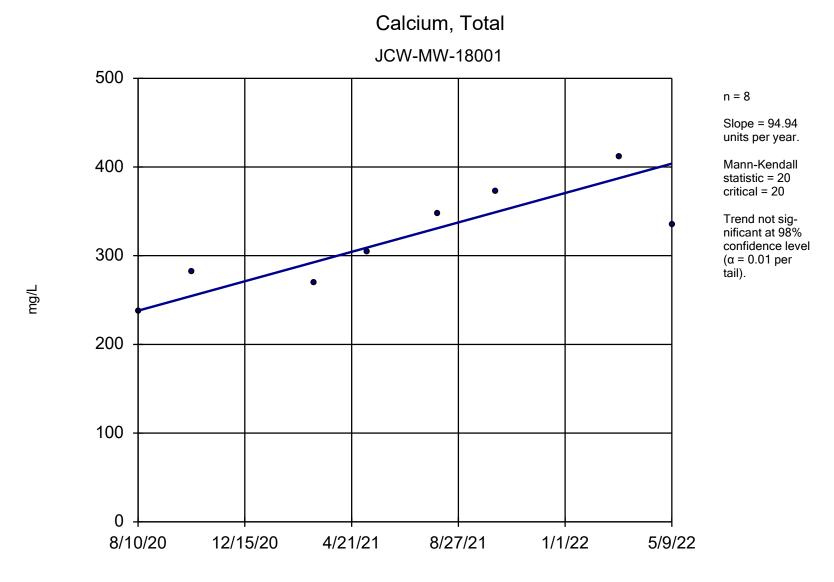
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



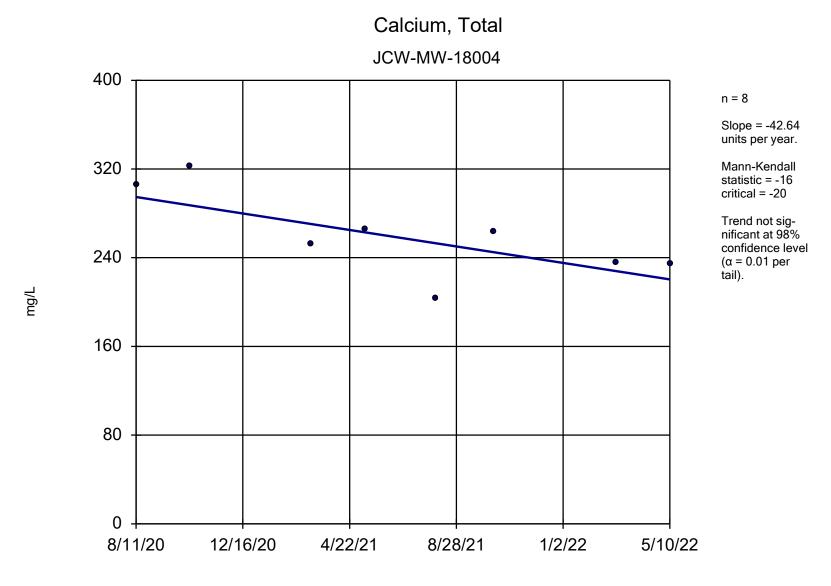
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



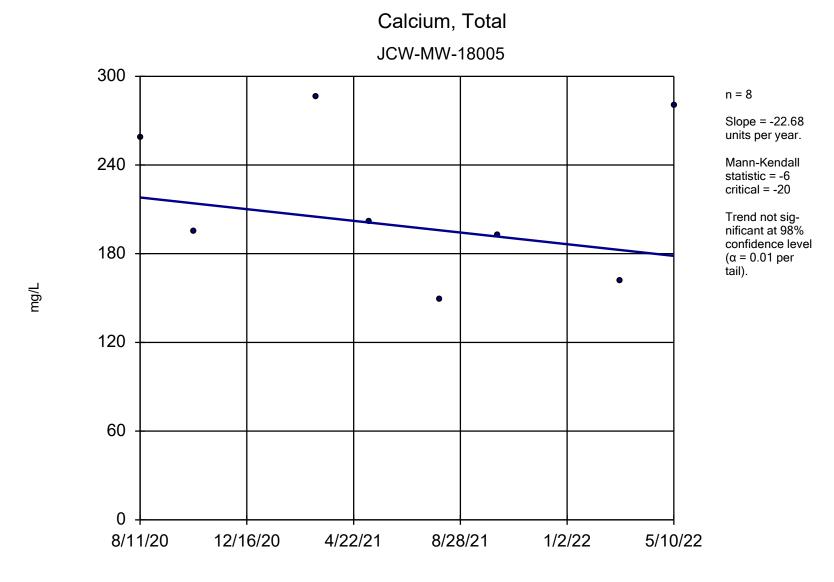
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



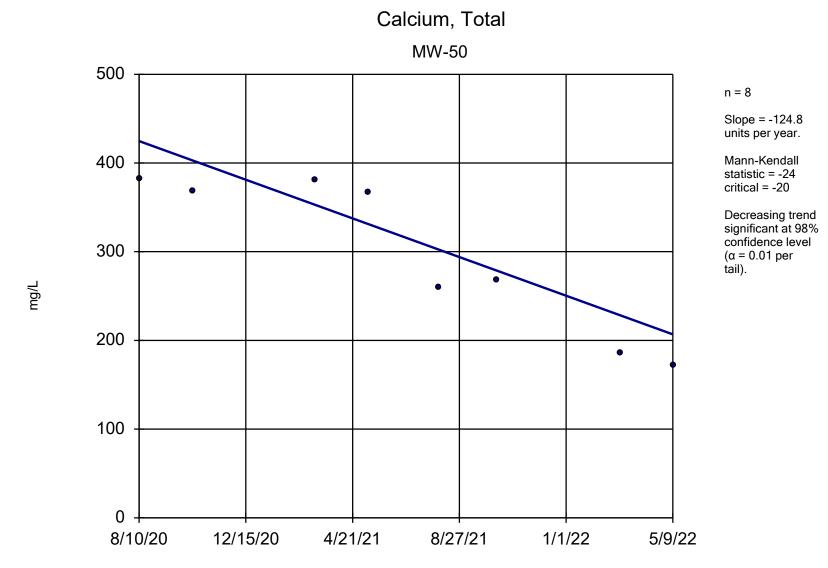
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



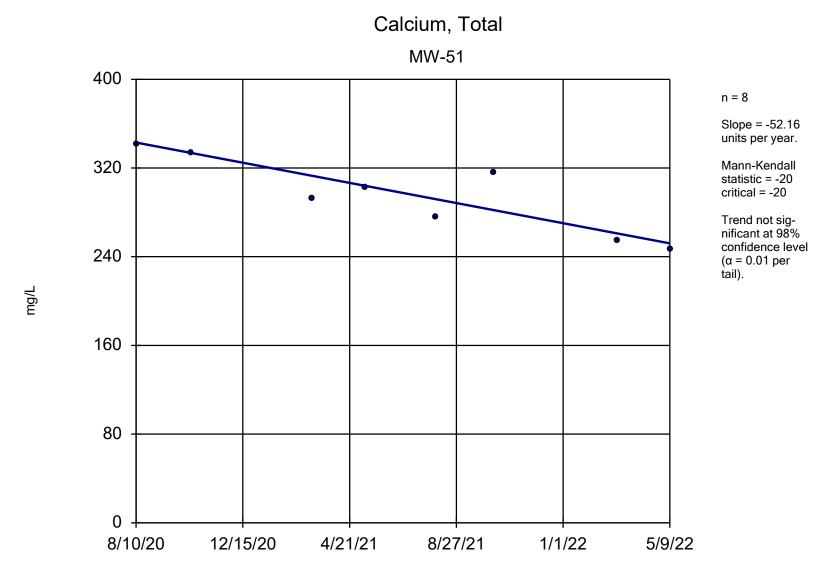
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



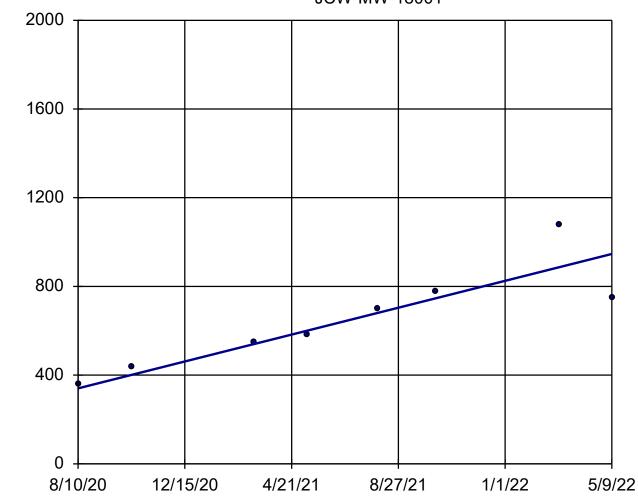
Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

mg/L

#### Sulfate





n = 8

Slope = 347.3units per year.

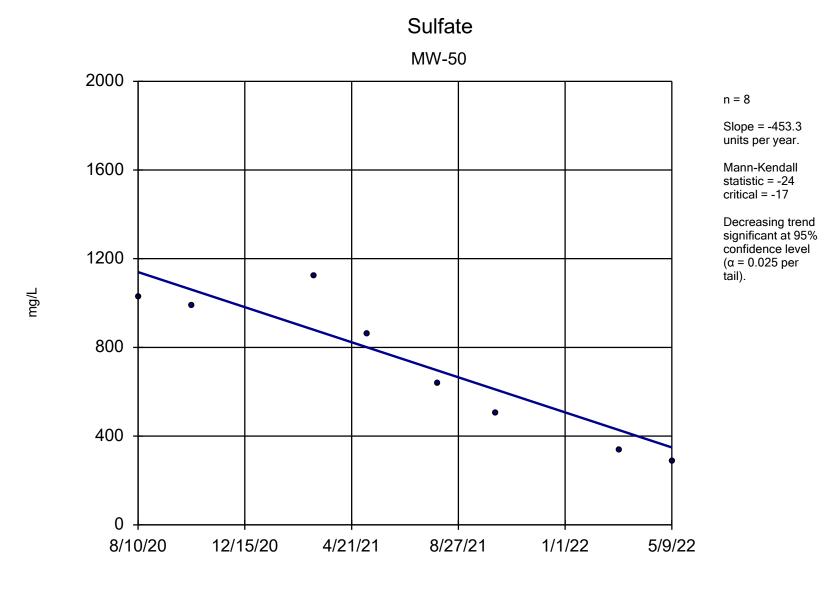
Mann-Kendall statistic = 24 critical = 20

Increasing trend significant at 98% confidence level  $(\alpha = 0.01 \text{ per})$ tail).

Sen's Slope Estimator Analysis Run 6/8/2022 2:48 PM

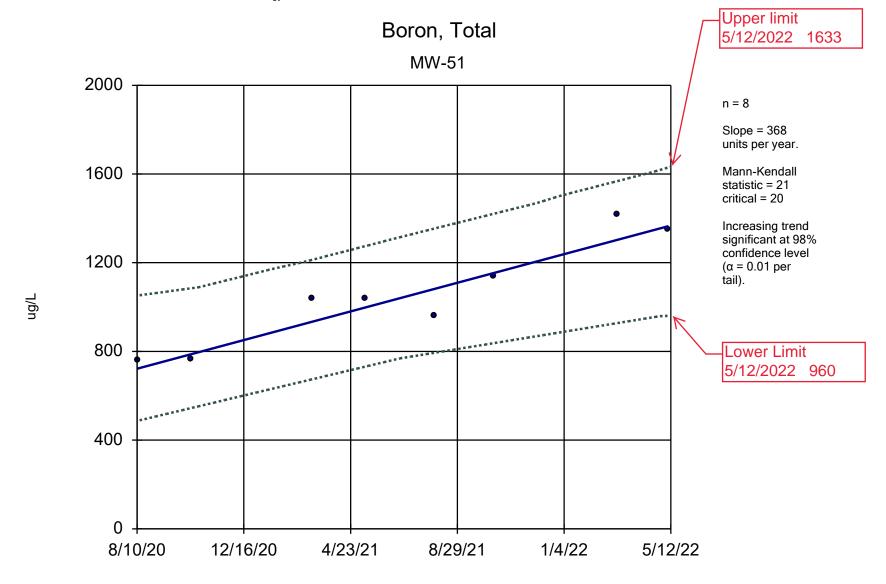
Client: Consumers Energy

Data: JCW\_HMPCCR\_Sanitas\_22Q2

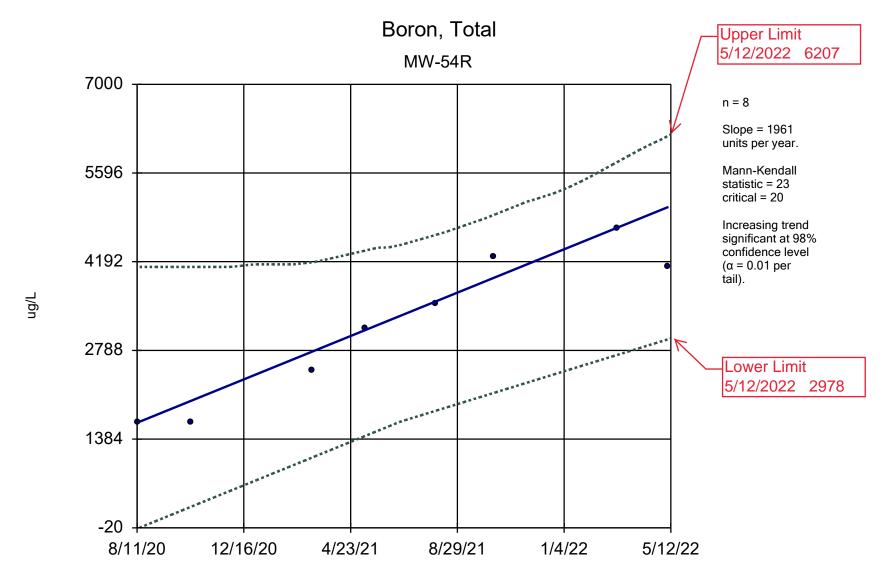


Sen's Slope Estimator Analysis Run 6/10/2022 2:22 PM

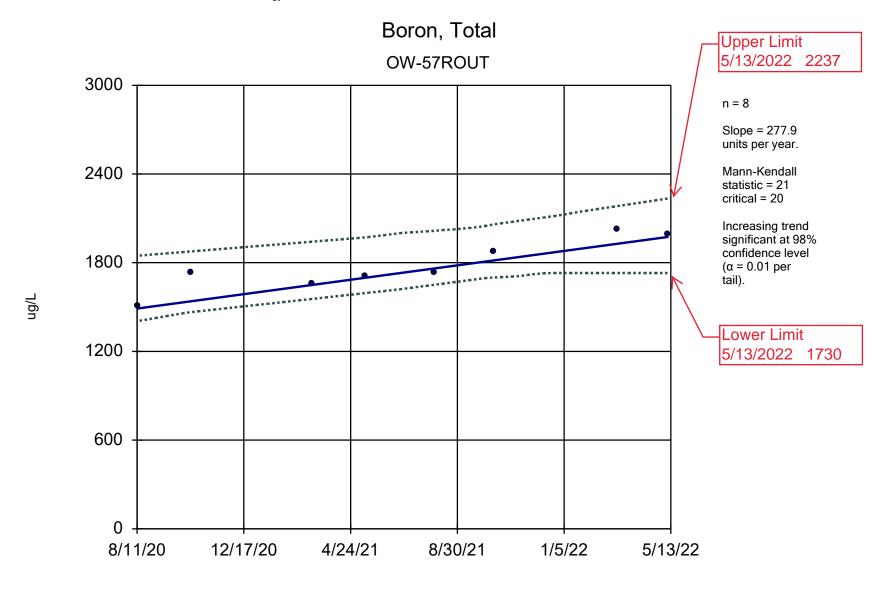
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



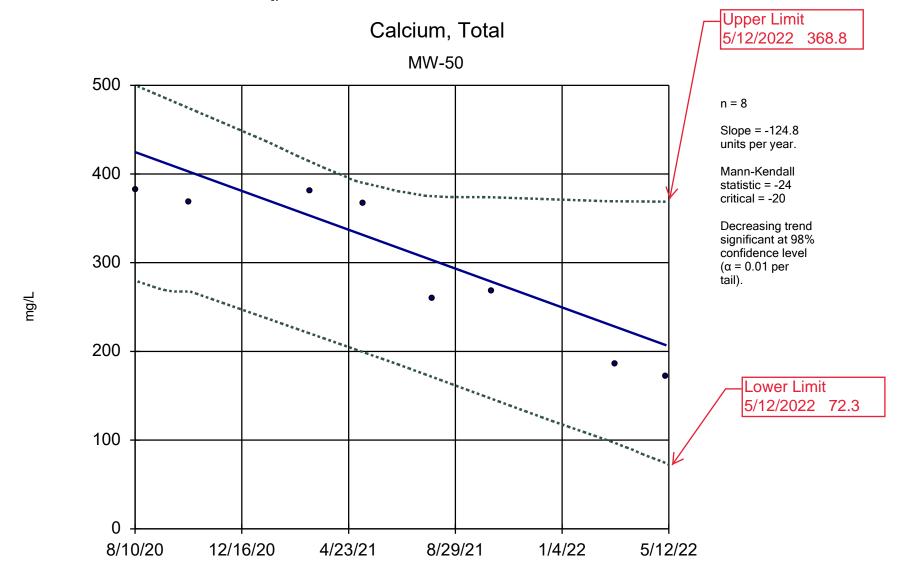
Sen's Slope and 98% Confidence Band Analysis Run 6/8/2022 2:37 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



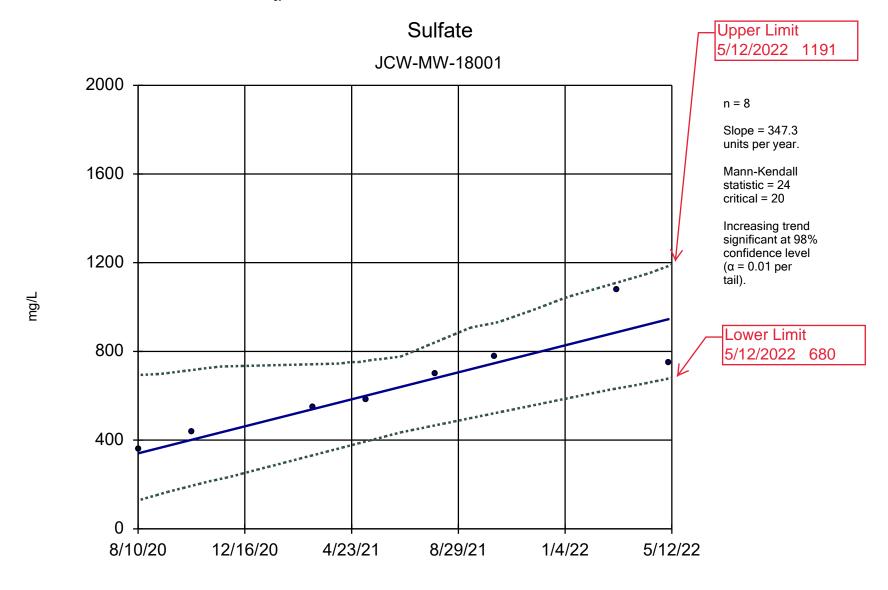
Sen's Slope and 98% Confidence Band Analysis Run 6/8/2022 2:39 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



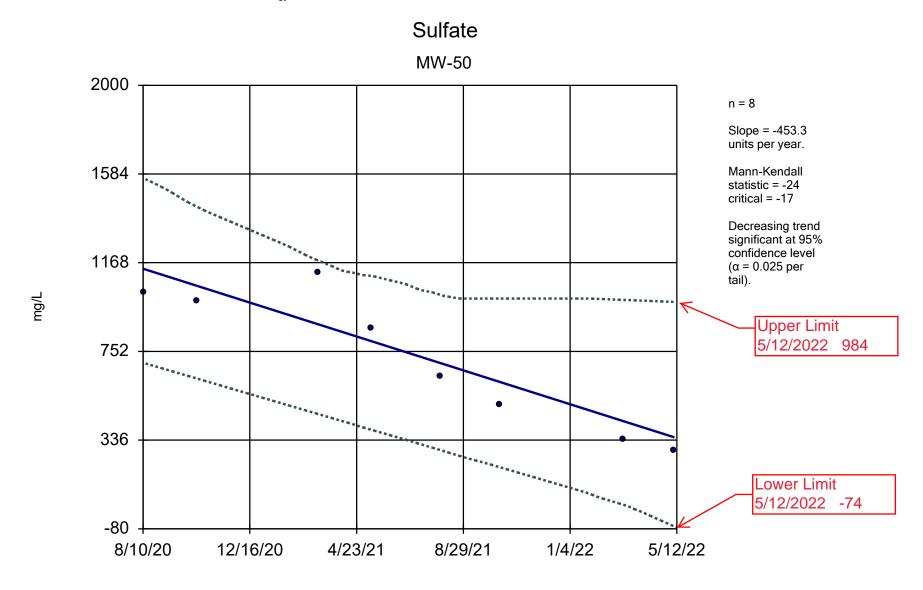
Sen's Slope and 98% Confidence Band Analysis Run 6/8/2022 2:40 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope and 98% Confidence Band Analysis Run 6/8/2022 2:41 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



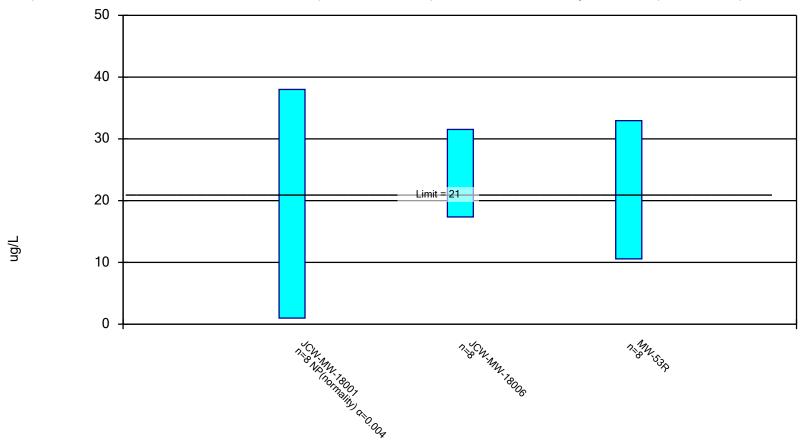
Sen's Slope and 98% Confidence Band Analysis Run 6/8/2022 2:44 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2



Sen's Slope and 98% Confidence Band Analysis Run 6/10/2022 2:24 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

# Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Arsenic, Total Analysis Run 6/9/2022 10:55 AM

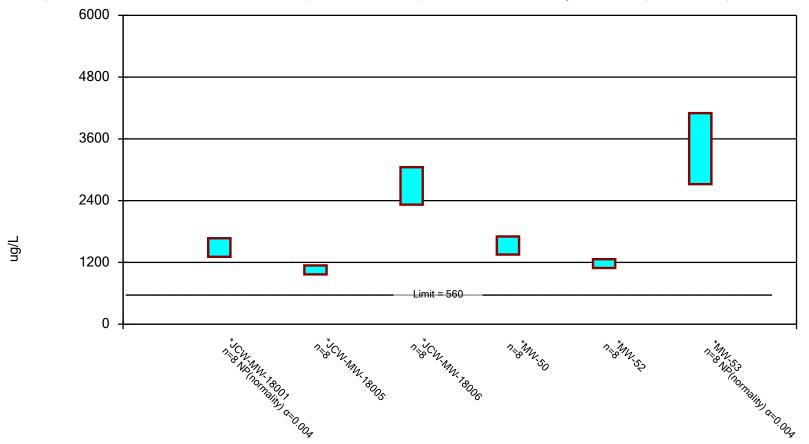
Constituent: Arsenic, Total (ug/L) Analysis Run 6/9/2022 11:00 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-18001	JCW-MW-18006	MW-53R
8/10/2020	3		
8/11/2020		12	31
10/13/2020	3		
10/14/2020		22	40
3/8/2021	2		19
3/9/2021		30	
5/10/2021	2		18
5/11/2021		30	
8/2/2021	38		23
8/3/2021		25	
10/11/2021	1		25
10/12/2021		21	
3/7/2022	<1	33	
3/8/2022			10
5/9/2022	<1	22.5 (D)	8
Mean	6.375	24.44	21.75
Std. Dev.	12.81	6.673	10.55
Upper Lim.	38	31.51	32.94
Lower Lim.	1	17.36	10.56

# 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 6/9/2022 10:55 AM

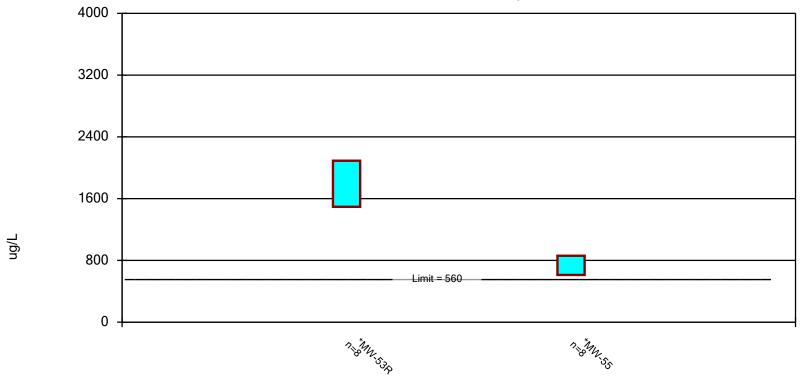
Constituent: Boron, Total (ug/L) Analysis Run 6/9/2022 11:00 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-18001	JCW-MW-18005	JCW-MW-18006	MW-50	MW-52	MW-53
8/10/2020	1310			1395 (D)	1200	2760
8/11/2020		1100	2040			
10/13/2020	1370			1470		
10/14/2020		1090	2610		1110	2720
3/8/2021	1350			1560 (D)	1120	3920
3/9/2021		987	2650			
5/10/2021	1340			1350 (D)	1160	3790
5/11/2021		919	2720			
8/2/2021	1610			1575 (D)	1140	3820
8/3/2021		1080	2640			
10/11/2021	1670			1865 (D)	1280	3820
10/12/2021		1190	2600			
3/7/2022	1670	1065 (D)	3220			
3/8/2022				1615 (D)	1310	4100
5/9/2022	1560		3010 (D)	1400 (D)	1090	3880
5/10/2022		1010				
Mean	1485	1055	2686	1529	1176	3601
Std. Dev.	157.1	82.24	343.3	166.3	80.88	540.3
Upper Lim.	1670	1142	3050	1705	1262	4100
Lower Lim.	1310	968	2322	1353	1091	2720

#### 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 6/9/2022 10:55 AM

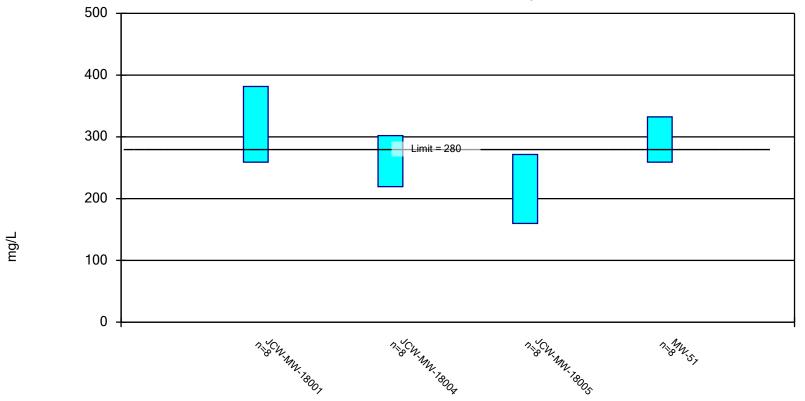
Constituent: Boron, Total (ug/L) Analysis Run 6/9/2022 11:00 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	MW-53R	MW-55
8/11/2020	1540	592
10/14/2020	1780	705
3/8/2021	1510	
3/9/2021		593
5/10/2021	1580	
5/11/2021		866
8/2/2021	1710	
8/3/2021		873
10/11/2021	2060	
10/12/2021		788
3/7/2022		826
3/8/2022	2330	
5/9/2022	1830	
5/10/2022		642
Mean	1793	735.6
Std. Dev.	282.2	118
Upper Lim.	2092	860.7
Lower Lim.	1493	610.6

#### 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 6/9/2022 10:56 AM

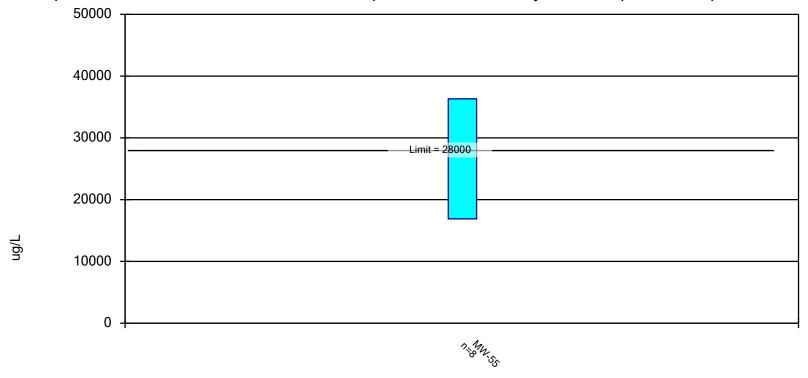
Constituent: Calcium, Total (mg/L) Analysis Run 6/9/2022 11:00 AM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	JCW-MW-18001	JCW-MW-18004	JCW-MW-18005	MW-51
8/10/2020	237			341
8/11/2020		306	259	
10/13/2020	282			
10/14/2020		323	195	333.5 (D)
3/8/2021	270	252		293
3/9/2021			286	
5/10/2021	305			303
5/11/2021		266	202	
8/2/2021	348			276
8/3/2021		203	149	
10/11/2021	373			316
10/12/2021		264	193	
3/7/2022	412	236	161.5 (D)	
3/8/2022				255
5/9/2022	335			247
5/10/2022		235	280	
Mean	320.3	260.6	215.7	295.6
Std. Dev.	57.74	39	52.74	34.58
Upper Lim.	381.5	302	271.6	332.2
Lower Lim.	259	219.3	159.8	258.9

#### Parametric Confidence Interval

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



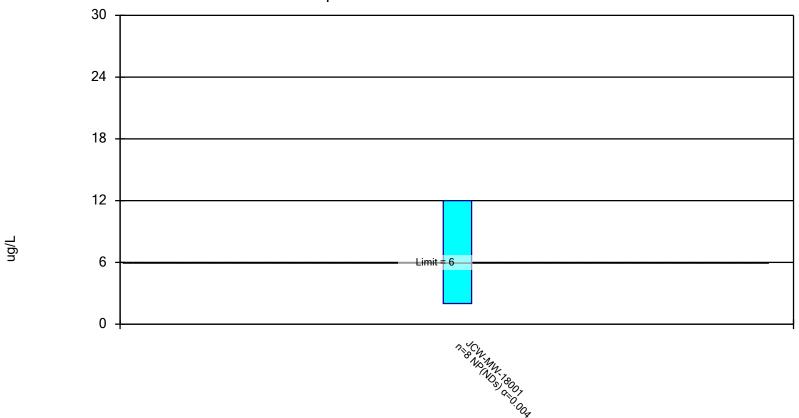
Constituent: Iron, Total Analysis Run 6/9/2022 10:56 AM

Constituent: Iron, Total (ug/L) Analysis Run 6/9/2022 11:00 AM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	MW-55
8/11/2020	21300
10/14/2020	21800
3/9/2021	23500
5/11/2021	21500
8/3/2021	39400
10/12/2021	40500
3/7/2022	29800
5/10/2022	15000
Mean	26600
Std. Dev.	9170
Upper Lim.	36319
Lower Lim.	16881

#### Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



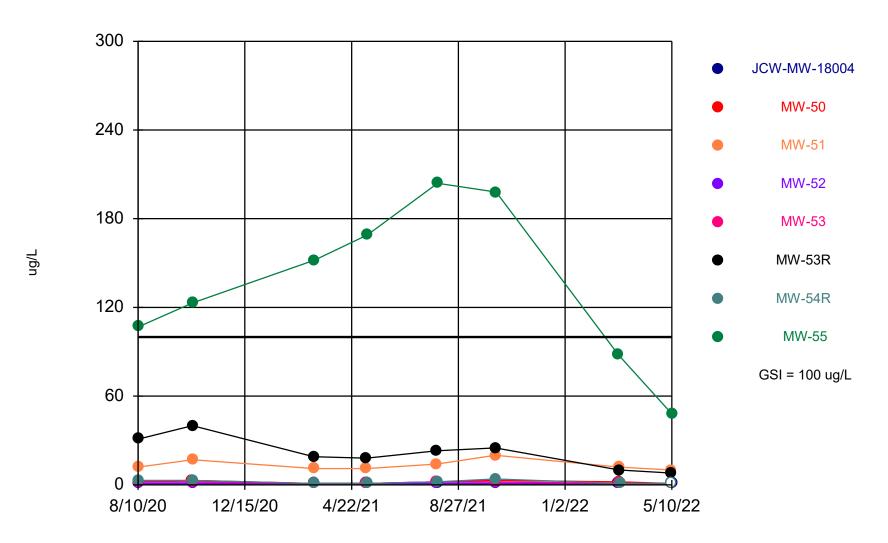
Constituent: Vanadium, Total Analysis Run 6/16/2022 1:11 PM

Constituent: Vanadium, Total (ug/L) Analysis Run 6/16/2022 1:11 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

JCW-MW-18001
<2
<2
<2
2
12
<2
<2
<2
3.25
3.536
12
2

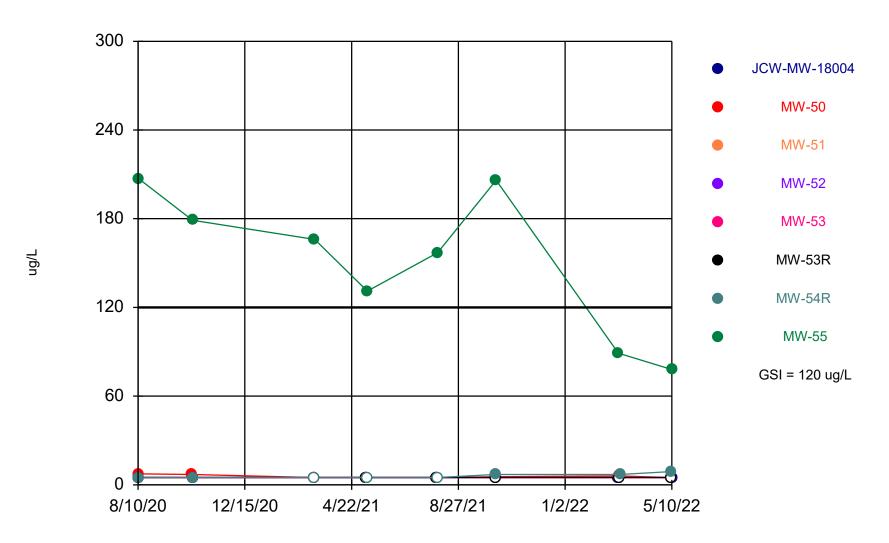
# Attachment 2 GSI Evaluation Sanitas™ Output Files

# Arsenic Comparison to GSI



Time Series Analysis Run 6/9/2022 12:37 PM

# Molybdenum Comparison to GSI



Time Series Analysis Run 6/9/2022 12:38 PM

#### **Summary Report**

Constituent: Arsenic, Total Analysis Run 6/9/2022 12:39 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 64 ND/Trace = 19 Wells = 8 Minimum Value = 1 Maximum Value = 204 Mean Value = 22.33 Median Value = 2 Standard Deviation = 47.71 Coefficient of Variation = 2.137 Skewness = 2.698

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18004	8	8	1	1	1	1	0	0	NaN
MW-50	8	0	1	3	1.875	2	0.8345	0.4451	0.2217
MW-51	8	0	10	20	13.38	12	3.462	0.2588	0.9876
MW-52	8	7	1	1	1	1	0	0	NaN
MW-53	8	3	1	2	1.5	1.5	0.5345	0.3563	0
MW-53R	8	0	8	40	21.75	21	10.55	0.4852	0.3393
MW-54R	8	1	1	4	2	1.5	1.195	0.5976	0.5367
MW-55	8	0	48	204	136.1	137.5	54.6	0.4011	-0.2192

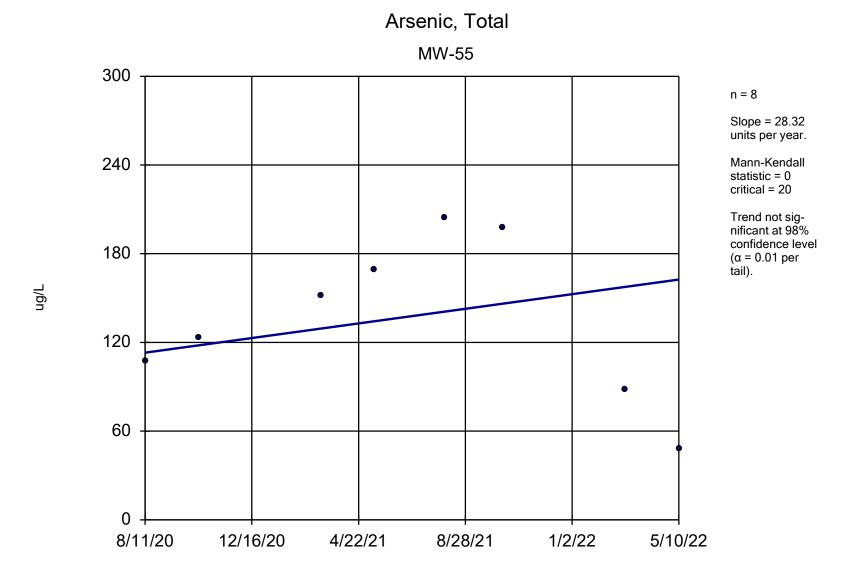
### **Summary Report**

Constituent: Molybdenum, Total Analysis Run 6/9/2022 12:39 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

For observations made between 8/10/2020 and 5/10/2022, a summary of the selected data set:

Observations = 64 ND/Trace = 47 Wells = 8 Minimum Value = 5 Maximum Value = 207 Mean Value = 23.55 Median Value = 5 Standard Deviation = 51.45 Coefficient of Variation = 2.185 Skewness = 2.655

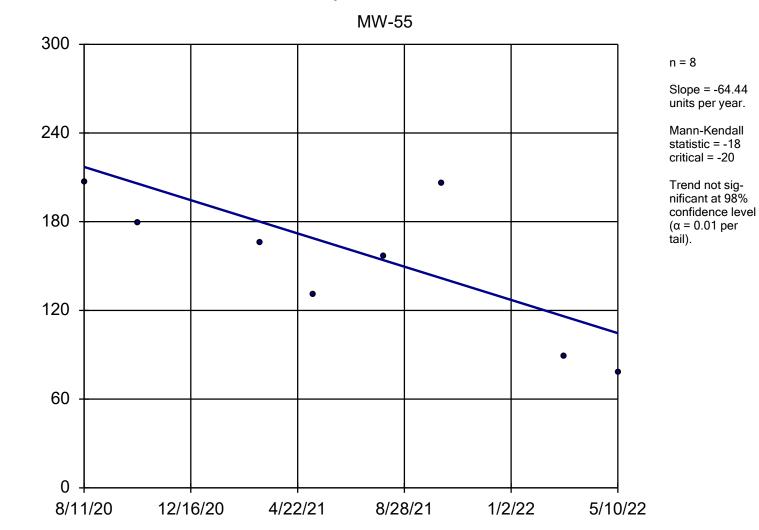
<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
JCW-MW-18004	8	8	5	5	5	5	0	0	NaN
MW-50	8	4	5	7.5	5.75	5.25	1	0.1739	0.8591
MW-51	8	8	5	5	5	5	0	0	NaN
MW-52	8	8	5	5	5	5	0	0	NaN
MW-53	8	8	5	5	5	5	0	0	NaN
MW-53R	8	8	5	5	5	5	0	0	NaN
MW-54R	8	3	5	9	6	5	1.512	0.252	1.061
MW-55	8	0	78	207	151.6	161.5	48.95	0.3229	-0.3896



Sen's Slope Estimator Analysis Run 6/9/2022 12:40 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

ng/L

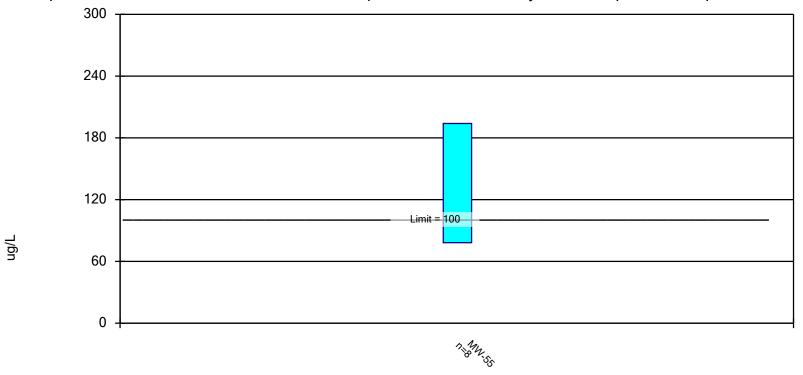
# Molybdenum, Total



Sen's Slope Estimator Analysis Run 6/9/2022 12:40 PM
Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

#### 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 6/9/2022 12:50 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

# **Confidence Interval**

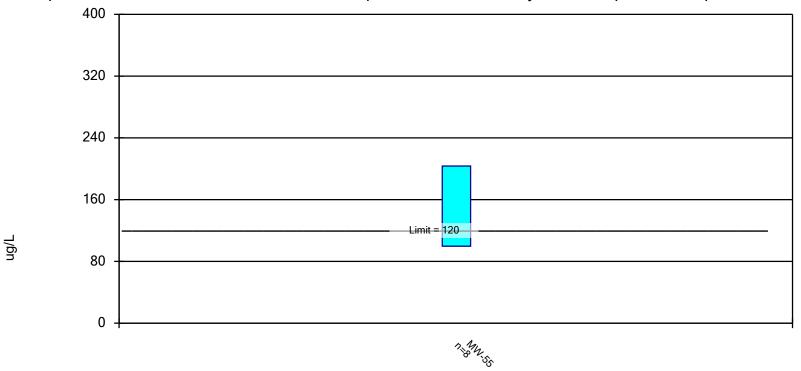
Constituent: Arsenic, Total (ug/L) Analysis Run 6/9/2022 12:51 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	MW-55
8/11/2020	107
10/14/2020	123
3/9/2021	152
5/11/2021	169
8/3/2021	204
10/12/2021	198
3/7/2022	88
5/10/2022	48
Mean	136.1
Std. Dev.	54.6
Upper Lim.	194
Lower Lim.	78.25

#### Parametric Confidence Interval

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



Constituent: Molybdenum, Total Analysis Run 6/9/2022 12:50 PM

Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

# **Confidence Interval**

Constituent: Molybdenum, Total (ug/L) Analysis Run 6/9/2022 12:51 PM Client: Consumers Energy Data: JCW\_HMPCCR\_Sanitas\_22Q2

	MW-55
8/11/2020	207
10/14/2020	179
3/9/2021	166
5/11/2021	131
8/3/2021	157
10/12/2021	206
3/7/2022	89
5/10/2022	78
Mean	151.6
Std. Dev.	48.95
Upper Lim.	203.5
Lower Lim.	99.74



# Appendix E Laboratory Analytical Report



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 25, 2022

Subject: PART 115 GROUNDWATER MONITORING – JCW POREWATER – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Environmental Corporation

1540 Eisenhower Place Ann Arbor, MI 48108

**Chemistry Project: 22-0441** 

TRC Environmental, Inc. conducted groundwater monitoring at the JCWeadock site on 05/09/2022 and 05/10/2022, for the 2<sup>nd</sup> 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 05/11/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

#### **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:

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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



#### **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 Weadock Porewater Wells

**Date Received:** 5/11/2022 **Chemistry Project:** 22-0441

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0441-01	JCW-MW-18001	Groundwater	05/09/2022 07:05 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-02	JCW-MW-18004	Groundwater	05/10/2022 06:34 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-03	JCW-MW-18005	Groundwater	05/10/2022 10:04 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-04	JCW-MW-18006	Groundwater	05/09/2022 01:33 PM	JCW Solid Waste Disposal Area, Porewater
22-0441-05	MW-50	Groundwater	05/09/2022 08:05 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-06	MW-51	Groundwater	05/09/2022 09:17 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-07	MW-52	Groundwater	05/09/2022 10:20 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-08	MW-53	Groundwater	05/09/2022 11:09 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-09	MW-53R	Groundwater	05/09/2022 02:34 PM	JCW Solid Waste Disposal Area, Porewater
22-0441-10	MW-54R	Groundwater	05/09/2022 01:15 PM	JCW Solid Waste Disposal Area, Porewater
22-0441-11	MW-55	Groundwater	05/10/2022 08:12 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-12	OW-57R OUT	Groundwater	05/10/2022 11:05 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-13	MW-58	Groundwater	05/09/2022 12:57 PM	JCW Solid Waste Disposal Area, Porewater
22-0441-14	DUP-JCW-LF-01	Groundwater	05/09/2022 12:00 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-15	DUP-JCW-LF-02	Groundwater	05/09/2022 12:00 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-16	JCW-MW-18001 MS	Groundwater	05/09/2022 07:05 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-17	JCW-MW-18001 MSD	Groundwater	05/09/2022 07:05 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-18	FB-01	Water	05/09/2022 11:40 AM	JCW Solid Waste Disposal Area, Porewater
22-0441-19	EB-01	Water	05/09/2022 11:35 AM	JCW Solid Waste Disposal Area, Porewater



05/25/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18001
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-01
 Collect Time:
 07:05 AM

	, Aqueous				Analyst: CLH	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	з Ехр	Aliquot #: 22-0	)441-01-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	80		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1560		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	335000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	3		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	210		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	76		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	88100		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	8		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	14200		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	154000		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analyt	e List. Cl. F.	SO4. Agu	ieous	Aliguot #: 22-0	)441-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	58800	_	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	752000		ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Alignot #- 22-0	)441-01-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
		9		• • •	,	_
Total Dissolved Solids	1970		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

05/09/2022

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: 22-0441

Collect Date:

Field Sample ID: JCW-MW-18001 Lab Sample ID: 22-0441-01

Collect Time: 07:05 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	650000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	650000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18004
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-02
 Collect Time:
 06:34 AM

Units	RL	Analysis Date	Trooking
		, mary oro Dato	Tracking
g/L	0.2	05/12/2022	AB22-0512-02
Ехр	Aliquot #: 22-0	441-02-C01-A02	Analyst: EB
Units	RL	Analysis Date	Tracking
g/L	1.0	05/17/2022	AB22-0516-06
g/L	1.0	05/17/2022	AB22-0516-06
g/L	5.0	05/17/2022	AB22-0516-06
g/L	1.0	05/17/2022	AB22-0516-06
g/L	20.0	05/16/2022	AB22-0516-06
g/L	0.2	05/17/2022	AB22-0516-06
g/L	1000.0	05/16/2022	AB22-0516-06
g/L	1.0	05/17/2022	AB22-0516-06
g/L	6.0	05/17/2022	AB22-0516-06
g/L	1.0	05/17/2022	AB22-0516-06
g/L	20.0	05/16/2022	AB22-0516-06
g/L	1.0	05/17/2022	AB22-0516-06
g/L	10.0	05/17/2022	AB22-0516-06
g/L	1000.0	05/16/2022	AB22-0516-06
g/L	5.0	05/17/2022	AB22-0516-06
g/L	2.0	05/17/2022	AB22-0516-06
g/L	100.0	05/16/2022	AB22-0516-06
g/L	1.0	05/17/2022	AB22-0516-06
g/L	0.2	05/17/2022	AB22-0516-06
g/L	1000.0	05/16/2022	AB22-0516-06
g/L	2.0	05/17/2022	AB22-0516-06
g/L	2.0	05/17/2022	AB22-0516-06
g/L	10.0	05/17/2022	AB22-0516-06
ous	Aliquot #: 22-0	441-02-C02-A01	Analyst: DMW
Units	RL	Analysis Date	Tracking
g/L	1000.0	05/18/2022	AB22-0518-14
-			AB22-0518-14
g/L	1000.0	05/19/2022	AB22-0518-14
	Aliquot #- 22-0	441-02-C03-Δ01	Analyst: CLH
Units	RL	Analysis Date	Tracking
		•	AB22-0511-09
ıg/L	10.0	03/11/2022	AD22-0011-09
	Units  g/L  g/L  g/L  g/L  g/L  g/L  g/L  g/	Units RL  g/L 1.0  g/L 1.0  g/L 5.0  g/L 20.0  g/L 0.2  g/L 1.00  g/L 1.00  g/L 1.00  g/L 1.00  g/L 1.00  g/L 1.00  g/L 1.00  g/L 1.00  g/L 20.0  g/L 1.00  g/L 20.0  g/L 1.00  g/L 1.00  g/L 1.00  g/L 1.00  g/L 2.00  g/L 1.00  g/L 2.0  g/L 2.0  g/L 1.00  g/L 2.0  g/L 1.00  g/L 2.0  g/L 1.00  g/L 1.00  g/L 2.0  g/L 1.00  g/L 2.0  g/L 1.00  g/L 2.0  g/L 1.00  Aliquot #: 22-0  Units RL  G/L 1000.0  g/L 1000.0  g/L 1000.0  g/L 1000.0  g/L 1000.0	Units RL Analysis Date  g/L 1.0 05/17/2022  g/L 5.0 05/17/2022  g/L 20.0 05/16/2022  g/L 1.0 05/17/2022  g/L 0.2 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 0.2 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 20.0 05/16/2022  g/L 1.0 05/17/2022  g/L 20.0 05/16/2022  g/L 1.0 05/17/2022  g/L 2.0 05/17/2022  g/L 2.0 05/17/2022  g/L 1.0 05/17/2022  g/L 2.0 05/17/2022  g/L 2.0 05/17/2022  g/L 2.0 05/17/2022  g/L 2.0 05/17/2022  g/L 1.0 05/17/2022  g/L 2.0 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 2.0 05/17/2022  g/L 2.0 05/17/2022  g/L 1.0 05/17/2022  g/L 2.0 05/17/2022  g/L 2.0 05/17/2022  g/L 1.0 05/17/2022  g/L 1.0 05/17/2022  g/L 2.0 05/17/2022  g/L 1.0 05/17/2022



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18004
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-02
 Collect Time:
 06:34 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	430000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	430000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



## **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18005
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-03
 Collect Time:
 10:04 AM

Mercury by EPA 7470A, Total, Aqueous			Aliquot #: 2	22-0441-03-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag U	nits RL	Analysis Date	Tracking
Mercury	ND	ug/	L 0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule A	ppendix III-IV To	tal Metals Ex	(p Aliquot #: 2	22-0441-03-C01-A02	Analyst: EB
Parameter(s)	Result	Flag U	nits RL	Analysis Date	Tracking
Antimony	ND	ug/	′L 1.0	05/17/2022	AB22-0516-06
Arsenic	5	ug/	′L 1.0	05/17/2022	AB22-0516-06
Barium	110	ug/	′L 5.0	05/17/2022	AB22-0516-06
Beryllium	ND	ug/	′L 1.0	05/17/2022	AB22-0516-06
Boron	1010	ug/	′L 20.0	05/16/2022	AB22-0516-06
Cadmium	ND	ug/	′L 0.2	05/17/2022	AB22-0516-06
Calcium	280000	ug/	′L 1000	.0 05/16/2022	AB22-0516-06
Chromium	ND	ug/	′L 1.0	05/17/2022	AB22-0516-06
Cobalt	ND	ug/	′L 6.0	05/17/2022	AB22-0516-06
Copper	2	ug/	′L 1.0	05/17/2022	AB22-0516-06
Iron	1680	ug/	′L 20.0	05/16/2022	AB22-0516-06
Lead	ND	ug/	′L 1.0	05/17/2022	AB22-0516-06
Lithium	33	ug/	′L 10.0	05/17/2022	AB22-0516-06
Magnesium	66600	ug/	′L 1000	.0 05/16/2022	AB22-0516-06
Molybdenum	6	ug/	′L 5.0	05/17/2022	AB22-0516-06
Nickel	ND	ug/	′L 2.0	05/17/2022	AB22-0516-06
Potassium	2760	ug/	′L 100.	0 05/16/2022	AB22-0516-06
Selenium	2	ug/	′L 1.0	05/17/2022	AB22-0516-06
Silver	ND	ug/	′L 0.2	05/17/2022	AB22-0516-06
Sodium	39600	ug/	′L 1000	.0 05/16/2022	AB22-0516-06
Thallium	ND	ug/	′L 2.0	05/17/2022	AB22-0516-06
Vanadium	ND	ug/	′L 2.0	05/17/2022	AB22-0516-06
Zinc	ND	ug/	′L 10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule An	alyte List, Cl, F,	SO4, Aqueoı	us Aliquot #: 2	22-0441-03-C02-A01	Analyst: DMW
Parameter(s)	Result		nits RL	Analysis Date	Tracking
Chloride	32600	ug/	′L 1000	.0 05/18/2022	AB22-0518-14
Fluoride	ND	ug/			AB22-0518-14
Sulfate	437000	ug/			AB22-0518-14
Total Dissolved Solids by SM 2540	c		Aliquot #: 1	22-0441-03-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag U	nits RL	Analysis Date	Tracking
Total Dissolved Solids	1330	mg		-	AB22-0511-09
. 3.4. 2.000.704 201140		0441 Page 0 of		, 00/11/2022	, 1222 0011 00



**Report Date:** 05/25/22

22-0441

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project:

 Field Sample ID:
 JCW-MW-18005
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-03
 Collect Time:
 10:04 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	535000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	535000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18006
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-04
 Collect Time:
 01:33 PM

	Aqueous			-	quot #: 22-0441-04-C01-A01	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	441-04-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	22		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	514		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	2990		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	136000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	1		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	6600		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	56		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	49200		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	6		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	7900		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	92200		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	3		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analyt	e List. Cl. F.	SO4. Aau	ieous	Aliquot #: 22-0	441-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	67300	•	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	32800		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquet #: 22 0	)441-04-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
		9	03		a.yolo bato	. raoming
Total Dissolved Solids	788		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18006
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-04
 Collect Time:
 01:33 PM

Alkalinity by SM 2320B	Aliquot #: 22-0	Analyst: DLS			
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	603000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	603000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-50
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-05
 Collect Time:
 08:05 AM

Mercury by EPA 7470A, Total, Aqueous			Aliquot #: 22-0	0441-05-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Ap	pendix III-IV To	tal Metals Exp	Aliguot #: 22-0	0441-05-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	1	ug/L	1.0	05/17/2022	AB22-0516-06
Barium	86	ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1360	ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND	ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	169000	ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	1	ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND	ug/L	6.0	05/17/2022	AB22-0516-06
Copper	1	ug/L	1.0	05/17/2022	AB22-0516-06
Iron	723	ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	69	ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	48000	ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND	ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND	ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	8270	ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2	ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND	ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	71600	ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND	ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND	ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND	ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Ana	lyte List, CI, F,	SO4, Aqueous	Aliquot #: 22-0	)441-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Chloride	53300	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND	ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	285000	ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C	:		Alignot #: 22-0	0441-05-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1020	mg/L	10.0	05/11/2022	AB22-0511-09
Total Dissolved Solids	1020	mg/L	10.0	00/11/2022	AD22-0311-09



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-50
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-05
 Collect Time:
 08:05 AM

Alkalinity by SM 2320B	Aliquot #: 22-0	Analyst: DLS			
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	421000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	421000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-51
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-06
 Collect Time:
 09:17 AM

	S			Aliquot #: 22-0		Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	441-06-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	10		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	150		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1350		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	247000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	1		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	2		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	1210		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	56		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	66400		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	6600		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	133000		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analyt	e List. Cl. F.	SO4. Agu	ieous	Aliguot #: 22-0	441-06-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	92800	•	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	420000		ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Alignot #- 22-0	)441-06-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
		9			,	
Total Dissolved Solids	1510		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-51
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-06
 Collect Time:
 09:17 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	589000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	589000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-52
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-07
 Collect Time:
 10:20 AM

Mercury by EPA 7470A, Total, Aqueou					)441-07-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-07-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	107		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1090		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	231000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	1		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	2		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	2030		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	25		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	105000		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	3810		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	69800		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analyt	te List. Cl. F.	SO4. Agu	ieous	Aliquot #: 22-0	)441-07-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	50500	3	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14 AB22-0518-14
Sulfate	591000		ug/L ug/L	1000.0	05/19/2022	AB22-0518-14 AB22-0518-14
			ū			
Total Dissolved Solids by SM 2540C				•	0441-07-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1490		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-52
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-07
 Collect Time:
 10:20 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	450000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Bicarbonate	450000	ug/L	10000.0	05/17/2022	AB22-0517-04
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-04



05/25/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-53
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-08
 Collect Time:
 11:09 AM

Mercury by EPA 7470A, Total, Aqueous			Aliquot #: 22-0	0441-08-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule	Appendix III-IV To	tal Metals Exp	Aliguot #: 22-0	0441-08-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Barium	356	ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Boron	3880	ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND	ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	147000	ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND	ug/L	6.0	05/17/2022	AB22-0516-06
Copper	1	ug/L	1.0	05/17/2022	AB22-0516-06
Iron	1060	ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND	ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	41	ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	41400	ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND	ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND	ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	7230	ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	1	ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND	ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	93700	ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND	ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND	ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND	ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule A	nalyte List, Cl, F,	SO4, Aqueous	Aliguot #: 22-0	0441-08-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Chloride	50900	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND	ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	215000	ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 254	0C		Aliquot #- 22-0	0441-08-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Total Dissolved Solids	886	mg/L	10.0	05/11/2022	AB22-0511-09
. Jan Dioconton Johns	330	mg/L	10.0	00/11/2022	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: 22-0441

 Field Sample ID:
 MW-53
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-08
 Collect Time:
 11:09 AM

Alkalinity by SM 2320B	Alkalinity by SM 2320B				Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	432000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	432000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05



05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-53R
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-09
 Collect Time:
 02:34 PM

				Aliquot #: 22-0		Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	з Ехр	Aliquot #: 22-0	)441-09-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	8		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	147		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1830		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	226000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	1		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	2		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	460		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	61		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	68000		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	5640		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	105000		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analyt	e List. Cl. F.	SO4. Agu	ieous	Aliguot #: 22-0	)441-09-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	41600	-	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	314000		ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliquet #: 22.0	)441-09-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
(-)		9	23		-	_
Total Dissolved Solids	1290		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0441**Collect Date: 05/09/2022

 Field Sample ID:
 MW-53R
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-09
 Collect Time:
 02:34 PM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	677000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	677000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05



05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-54R
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-10
 Collect Time:
 01:15 PM

						_
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	endix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-10-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	111		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	4110		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	169000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	1		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	121		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	64		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	48500		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	9		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	1810		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	29300		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analy	te List. Cl. F.	SO4. Agı	ieous	Aliquot #: 22-0	)441-10-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	35800	J	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	86300		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Discolved Calida by CM 25400				Alimont # 00.0	MAA AO OOO AOA	Amalos (- Old
Total Dissolved Solids by SM 2540C Parameter(s)	Result	Elac	Units	Aliquot #: 22-0	0441-10-C03-A01	Analyst: CLH Tracking
• •		Flag			Analysis Date	_
Total Dissolved Solids	712		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-54R
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-10
 Collect Time:
 01:15 PM

Alkalinity by SM 2320B		Aliquot #: 22-0	Analyst: DLS		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	544000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	544000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05



05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-55
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-11
 Collect Time:
 08:12 AM

Mercury by EPA 7470A, Total, Aq				Aliquot #: 22-0441-11-C01-A01		Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule	Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-11-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	48		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	222		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	642		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	177000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	1		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	15000		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	24		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	35000		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	78		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	3		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	3630		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	3		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	109000		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule A	nalyte List, Cl, F,	SO4, Aqı	ieous	Aliquot #: 22-0	)441-11-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	11800		ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	249000		ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 254	.0C			Aliquot #: 22-0	)441-11-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	942		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-55
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-11
 Collect Time:
 08:12 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	441-11-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	541000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	541000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05



05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 OW-57R OUT
 Collect Date:
 05/10/2022

 Lab Sample ID:
 22-0441-12
 Collect Time:
 11:05 AM

Donomoton(o)	Descrit	<b>-</b> 1- 1	11-14-	ъ.	Analys!= D=0	T12
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	endix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-12-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	79		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1990		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	131000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	2		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	74		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	27		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	78800		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	7		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	14		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	2600		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	3		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	64400		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analy	te List, Cl, F,	SO4, Aqu	ieous	Aliquot #: 22-0	)441-12-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	57300	-	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	69400		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Alignot #- 22-0	)441-12-C03-A01	Analyst: CLF
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
• •		9			-	
Total Dissolved Solids	702		mg/L	10.0	05/11/2022	AB22-0511-09



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0441**Collect Date: 05/10/2022

Field Sample ID: **OW-57R OUT** Lab Sample ID: 22-0441-12

Collect Time: 11:05 AM

Alkalinity by SM 2320B		Aliquot #: 22-0	Analyst: DLS		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	538000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	538000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05



05/25/22



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-58
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-13
 Collect Time:
 12:57 PM

	IS			-	0441-13-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule Appe	endix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-13-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	106		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	130		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	120000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	1		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	10100		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	21		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	20300		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	6		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	4720		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	182000		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	4		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analy	te List, Cl, F,	SO4, Agu	ieous	Aliquot #: 22-0	)441-13-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	265000		ug/L	1000.0	05/19/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	13500		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0	)441-13-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	934	9			-	AB22-0511-09
TOTAL DISSUIVED SUILUS	93 <del>4</del>		mg/L	10.0	05/11/2022	ADZZ-U311-U9



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 MW-58
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-13
 Collect Time:
 12:57 PM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	327000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	327000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05





Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: 22-0441

Report Date:

05/25/22

Field Sample ID: **DUP-JCW-LF-01**Lab Sample ID: 22-0441-14

Collect Date: 05/09/2022 Collect Time: 12:00 AM

Mercury by EPA 7470A, Total, Aqueous				Aliquot #: 22-0	Analyst: CLH	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rul	le Appendix III-IV To	tal Metals	s Exp	Aliquot #: 22-0	)441-14-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	1		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	86		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	1440		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	175000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	1		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	1		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	737		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	66		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	50100		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	6		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	9180		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	75700		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule	Analyte List, Cl, F,	SO4, Aqı	ieous	Aliguot #: 22-0	)441-14-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	51600		ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	286000		ug/L	1000.0	05/19/2022	AB22-0518-14
Total Dissolved Solids by SM 2	540C			Aliguot #: 22-0	)441-14-C03-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1050	. 9	mg/L	10.0	05/11/2022	AB22-0511-10
		2444 5			·· <del></del>	
	22.0	1441 Dogg 3	11 of 10			



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 DUP-JCW-LF-01
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-14
 Collect Time:
 12:00 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	Analyst: DLS	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	423000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	423000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05



Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 DUP-JCW-LF-02
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-15
 Collect Time:
 12:00 AM

Mercury by EPA 7470A, Total, Aqueo				-	)441-15-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule App	endix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-15-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Arsenic	23		ug/L	1.0	05/17/2022	AB22-0516-06
Barium	509		ug/L	5.0	05/17/2022	AB22-0516-06
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Boron	3030		ug/L	20.0	05/16/2022	AB22-0516-06
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Calcium	136000		ug/L	1000.0	05/16/2022	AB22-0516-06
Chromium	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06
Copper	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Iron	6360		ug/L	20.0	05/16/2022	AB22-0516-06
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06
Lithium	57		ug/L	10.0	05/17/2022	AB22-0516-06
Magnesium	48900		ug/L	1000.0	05/16/2022	AB22-0516-06
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Potassium	7220		ug/L	100.0	05/16/2022	AB22-0516-06
Selenium	1		ug/L	1.0	05/17/2022	AB22-0516-06
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06
Sodium	92400		ug/L	1000.0	05/16/2022	AB22-0516-06
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06
Vanadium	3		ug/L	2.0	05/17/2022	AB22-0516-06
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule Analy	rte List. Cl. F.	SO4. Agu	ieous	Aliguot #: 22-0	)441-15-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	67700	J	ug/L	1000.0	05/18/2022	AB22-0518-14
Fluoride	ND		ug/L	1000.0	05/18/2022	AB22-0518-14
Sulfate	34000		ug/L	1000.0	05/18/2022	AB22-0518-14
Total Dissalved Solida by SM 25400				Allmust #- 00.0	MAA AE OOO AOA	Amalos (- Old
Total Dissolved Solids by SM 2540C Parameter(s)	Result	Elac	Units	Aliquot #: 22-0 RL	0441-15-C03-A01	Analyst: CLH Tracking
• •		Flag			Analysis Date	_
Total Dissolved Solids	772		mg/L	10.0	05/11/2022	AB22-0511-10



**Report Date:** 05/25/22

Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 DUP-JCW-LF-02
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-15
 Collect Time:
 12:00 AM

Alkalinity by SM 2320B			Aliquot #: 22-0	441-15-C04-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Alkalinity Total	605000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Bicarbonate	605000	ug/L	10000.0	05/17/2022	AB22-0517-05
Alkalinity Carbonate	ND	ug/L	10000.0	05/17/2022	AB22-0517-05





Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457)

Laboratory Project: **22-0441**Collect Date: 05/09/2022

Report Date:

05/25/22

Field Sample ID: JCW-MW-18001 MS

Lab Sample ID: 22-0441-16 Collect Time: 07:05 AM

Mercury by EPA 7470A, Total, A	Aqueous			Aliquot #: 22-0	)441-16-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	<b>Analysis Date</b>	Tracking
Mercury	97.0		%	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rule	e Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	)441-16-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	108		%	1.0	05/17/2022	AB22-0516-06
Arsenic	105		%	1.0	05/17/2022	AB22-0516-06
Barium	105		%	5.0	05/17/2022	AB22-0516-06
Beryllium	96		%	1.0	05/17/2022	AB22-0516-06
Boron	114		%	20.0	05/16/2022	AB22-0516-06
Cadmium	103		%	0.2	05/17/2022	AB22-0516-06
Calcium	109		%	1000.0	05/16/2022	AB22-0516-06
Chromium	102		%	1.0	05/17/2022	AB22-0516-06
Cobalt	101		%	6.0	05/17/2022	AB22-0516-06
Copper	89		%	1.0	05/17/2022	AB22-0516-06
Iron	108		%	20.0	05/16/2022	AB22-0516-06
Lead	84		%	1.0	05/17/2022	AB22-0516-06
Lithium	99		%	10.0	05/17/2022	AB22-0516-06
Magnesium	116		%	1000.0	05/16/2022	AB22-0516-06
Molybdenum	116		%	5.0	05/17/2022	AB22-0516-06
Nickel	98		%	2.0	05/17/2022	AB22-0516-06
Potassium	111		%	100.0	05/16/2022	AB22-0516-06
Selenium	101		%	1.0	05/17/2022	AB22-0516-06
Silver	96.3		%	0.2	05/17/2022	AB22-0516-06
Sodium	119		%	1000.0	05/16/2022	AB22-0516-06
Thallium	88		%	2.0	05/17/2022	AB22-0516-06
Vanadium	107		%	2.0	05/17/2022	AB22-0516-06
Zinc	95		%	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule	Analyte List, Cl, F,	SO4, Aqu	ieous	Aliguot #: 22-0	)441-16-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	104	_	%	1000.0	05/19/2022	AB22-0518-14
Fluoride	84		%	1000.0	05/19/2022	AB22-0518-14
Sulfate	99		%	1000.0	05/19/2022	AB22-0518-14
Alkalinity by CM 2220B				Alleman #- 00.0	MAA 40 000 404	Amalassia DL C
Alkalinity by SM 2320B	Result	Elac	Units	Aliquot #: 22-0 RL	0441-16-C03-A01	Analyst: DLS
Parameter(s)		Flag			Analysis Date	Tracking
Alkalinity Total	91.5		%	10000.0	05/17/2022	AB22-0517-05
	22-	0441 Page 3	5 of 42			



Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 JCW-MW-18001 MSD
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-17
 Collect Time:
 07:05 AM

Mercury by EPA 7470A, Total, A	Aqueous		Aliquot #: 22-0	0441-17-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	107	%	0.2	05/12/2022	AB22-0512-02
Metals by EPA 6020B: CCR Rul	e Appendix III-IV To	tal Metals Exp	Aliquot #: 22-0	)441-17-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units	-	Analysis Date	Tracking
Antimony	106	%	1.0	05/17/2022	AB22-0516-06
Arsenic	104	%	1.0	05/17/2022	AB22-0516-06
Barium	107	%	5.0	05/17/2022	AB22-0516-06
Beryllium	94	%	1.0	05/17/2022	AB22-0516-06
Boron	117	%	20.0	05/16/2022	AB22-0516-06
Cadmium	101	%	0.2	05/17/2022	AB22-0516-06
Calcium	110	%	1000.0	05/16/2022	AB22-0516-06
Chromium	99	%	1.0	05/17/2022	AB22-0516-06
Cobalt	100	%	6.0	05/17/2022	AB22-0516-06
Copper	88	%	1.0	05/17/2022	AB22-0516-06
Iron	105	%	20.0	05/16/2022	AB22-0516-06
Lead	84	%	1.0	05/17/2022	AB22-0516-06
Lithium	96	%	10.0	05/17/2022	AB22-0516-06
Magnesium	118	%	1000.0	05/16/2022	AB22-0516-06
Molybdenum	115	%	5.0	05/17/2022	AB22-0516-06
Nickel	94	%	2.0	05/17/2022	AB22-0516-06
Potassium	115	%	100.0	05/16/2022	AB22-0516-06
Selenium	96	%	1.0	05/17/2022	AB22-0516-06
Silver	95.0	%	0.2	05/17/2022	AB22-0516-06
Sodium	124	%	1000.0	05/16/2022	AB22-0516-06
Thallium	88	%	2.0	05/17/2022	AB22-0516-06
Vanadium	106	%	2.0	05/17/2022	AB22-0516-06
Zinc	92	%	10.0	05/17/2022	AB22-0516-06
Anions by EPA 300.0 CCR Rule	Analyte List, Cl, F,	SO4, Aqueous	Aliquot #: 22-0	)441-17-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units		Analysis Date	Tracking
Chloride	104	%	1000.0	05/19/2022	AB22-0518-14
Fluoride	84	%	1000.0	05/19/2022	AB22-0518-14
Sulfate	95	%	1000.0	05/19/2022	AB22-0518-14
Alkalinity by SM 2320B			Aliauot #: 22-0	)441-17-C03-A01	Analyst: DLS
Parameter(s)	Result	Flag Units	•	Analysis Date	Tracking
Alkalinity Total	90.5	%	10000.0	05/17/2022	AB22-0517-05
•		0441 Dogo 26 of 42			



Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 FB-01
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-18
 Collect Time:
 11:40 AM

Matrix: Water

Mercury by EPA 7470A, Total, Aqueous							
Result	Flag	Units	RL	Analysis Date	Tracking		
ND		ug/L	0.2	05/12/2022	AB22-0512-02		
endix III-IV T	otal Metal	в Ехр	Aliquot #: 22-0	)441-18-C01-A02	Analyst: EB		
Result	Flag	Units	RL	Analysis Date	Tracking		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	5.0	05/17/2022	AB22-0516-06		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	20.0	05/16/2022	AB22-0516-06		
ND		ug/L	0.2	05/17/2022	AB22-0516-06		
ND		ug/L	1000.0	05/16/2022	AB22-0516-06		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	6.0	05/17/2022	AB22-0516-06		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	20.0	05/16/2022	AB22-0516-06		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	10.0	05/17/2022	AB22-0516-06		
ND		ug/L	1000.0	05/16/2022	AB22-0516-06		
ND		ug/L	5.0	05/17/2022	AB22-0516-06		
ND		ug/L	2.0	05/17/2022	AB22-0516-06		
ND		ug/L	100.0	05/16/2022	AB22-0516-06		
ND		ug/L	1.0	05/17/2022	AB22-0516-06		
ND		ug/L	0.2	05/17/2022	AB22-0516-06		
ND		ug/L	1000.0	05/16/2022	AB22-0516-06		
ND		ug/L	2.0	05/17/2022	AB22-0516-06		
ND		ug/L	2.0	05/17/2022	AB22-0516-06		
ND		ug/L	10.0	05/17/2022	AB22-0516-06		
te List, CI, F	, SO4, Aqւ	ieous	Aliquot #: 22-0	)441-18-C02-A01	Analyst: DMW		
Result	Flag	Units	RL	Analysis Date	Tracking		
ND		ug/L	1000.0	05/19/2022	AB22-0518-14		
ND		ug/L	1000.0	05/19/2022	AB22-0518-14		
ND		ug/L	1000.0	05/19/2022	AB22-0518-14		
	Result ND Result ND ND ND ND ND ND ND ND ND ND ND ND ND	Result Flag ND  Pendix III-IV Total Metals  Result Flag ND ND ND ND ND ND ND ND ND ND ND ND ND	Result         Flag         Units           ND         ug/L           endix III-IV Total Metals         Exp           Result         Flag         Units           ND         ug/L           ND         ug/L	Result	Result         Flag         Units         RL         Analysis Date           ND         ug/L         0.2         05/12/2022           endix III-IV Total Metals Exp         Aliquot #: 22-0441-18-C01-A02           Result         Flag         Units         RL         Analysis Date           ND         ug/L         1.0         05/17/2022           ND         ug/L         1.0         05/17/2022           ND         ug/L         5.0         05/17/2022           ND         ug/L         1.0         05/17/2022           ND         ug/L         1.0         05/17/2022           ND         ug/L         20.0         05/16/2022           ND         ug/L         1000.0         05/16/2022           ND         ug/L         1.0         05/17/2022           ND         ug/L         1000.0         05/16/2022           ND         ug/L         1000.0         05/16/2022		



05/25/22

Report Date:



# **Laboratory Services**

A CENTURY OF EXCELLENCE

Sample Site: JCW Solid Waste Disposal Area, Porewater (395457) Laboratory Project: 22-0441

 Field Sample ID:
 EB-01
 Collect Date:
 05/09/2022

 Lab Sample ID:
 22-0441-19
 Collect Time:
 11:35 AM

Matrix: Water

Mercury by EPA 7470A, Total	, Aqueous		Aliquot #: 22-0	441-19-C01-A01	Analyst: CLH		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking	
Mercury	ND		ug/L	0.2	05/12/2022	AB22-0512-02	
Metals by EPA 6020B: CCR R	ule Appendix III-IV To	tal Metals	<b>Ехр</b>	Aliquot #: 22-0	441-19-C01-A02	Analyst: EB	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking	
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Arsenic	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Barium	ND		ug/L	5.0	05/17/2022	AB22-0516-06	
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Boron	ND		ug/L	20.0	05/16/2022	AB22-0516-06	
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-06	
Calcium	ND		ug/L	1000.0	05/16/2022	AB22-0516-06	
Chromium	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-06	
Copper	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Iron	ND		ug/L	20.0	05/16/2022	AB22-0516-06	
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Lithium	ND		ug/L	10.0	05/17/2022	AB22-0516-06	
Magnesium	ND		ug/L	1000.0	05/16/2022	AB22-0516-06	
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-06	
Nickel	ND		ug/L	2.0	05/17/2022	AB22-0516-06	
Potassium	ND		ug/L	100.0	05/16/2022	AB22-0516-06	
Selenium	ND		ug/L	1.0	05/17/2022	AB22-0516-06	
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-06	
Sodium	ND		ug/L	1000.0	05/16/2022	AB22-0516-06	
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-06	
Vanadium	ND		ug/L	2.0	05/17/2022	AB22-0516-06	
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-06	
Anions by EPA 300.0 CCR Ru	ıle Analyte List. Cl. F.	SO4. Aau	ieous	Aliquot #: 22-0	441-19-C02-A01	Analyst: DMW	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking	
Chloride	ND	-	ug/L	1000.0	05/19/2022	AB22-0518-14	
Fluoride	ND		ug/L	1000.0	05/19/2022	AB22-0518-14	
Sulfate	ND		ug/L	1000.0	05/19/2022	AB22-0518-14	





**Report Date:** 05/25/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

# Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 **REVISION 3** ATTACHMENT A

# TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

-							
Proje	ect Log-In Number:	22-0	441				
Inspe	ection Date: 05	11/22		Inspection By	:_WH		
Samp	ole Origin/Project Name	:	22.7072	JON 70	rewater		
Shipi	ment Delivered By: Ent	er the type of	shipment carr	ier.			
	Other Hand Carry (w	hom) TRO	2			Airbor	
	Tracking Number:			Shipping	Form Attached:	Yes	No
Shipp	oing Containers: Enter	he type and n	number of ship	ping containers	received.		
	A CONTRACTOR OF THE PROPERTY O		ox		se		
	Loose/Unpackaged C	ontainers		Other			-
Cond	lition of Shipment: Ente		/	of the shipment	container.		
	Damaged Shipment C				d	Leakin	ıg
	Other						
	nent Security: Enter if a Shipping Containers I	Received: Op	ened	Sealed	1		
Enclo	CoC Wo			sed with the ship Air Data She		Other	_
Temp	perature of Containers:						
	As-Received Tempera	ture Range	.D-5.6°C	Samples Re	ceived on Ice: Y	es No_	
	M&TE # and Expirati	on 015402	10.3.2			L	
Numl	per and Type of Contain	ers: Enter th	ı ne total numbe	r of sample conta	ainers received.		
	Container Type	Water	Soil	Other		Broken	Leaking
	VOA (40mL or 60mL)	34	445	2			نسب
	Quart/Liter (g/p)		_				
PH 0-14	9-oz (amber glass jar)		-			_	
FSP 13-640 -508	2-oz (amber glass) 125 mL (plastic)	38	_	-			
	24 mL vial (glass)						
lot# 222 420 250	500 mL (plastic)	16		-			
exp. 8.1-23	Other		_	-			

# **CHAIN OF CUSTODY**



# CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 1 of 2

SAMP	LING SITE / CU	JSTOMER:			PROJECT NUMBER:	SAP CC or V	VO#:							A	NAI	YSIS	S REQ	UEST	ED		o a province main
Q2-20	)22 Weadock P	orewater Wells			22-0441 REQUESTER: Harold Register												Veeded)		QA REQUIREMENT:		
SAMP	LING TEAM:			J	TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ STANDARD ☒ OTHER														□ NPDES  □ TNI		
SENI	REPORT TO:	Caleb Batts			email:	phone:															□ ISO 17025
1	COPY TO:	Harold Regis	ter		MATRIX CODES:  GW = Groundwater OX = Other	r		CC	ONT.	AIN	ERS										☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Slud; W = Water / Aqueous Liquid A = Air	ge	PRESERVATIVE				VE	tals								☐ INTERNAL INFO	
	LAB	SAMPLE COLI	LECTION	RIX	S = Soil / General Solid WP = Wip O = Oil WT = Gen	neral Waste	TOTAL#			.7 F		MeOH	Total Metals	suc		Alkalinity					□ OTHER
SA	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOI	None HNO <sub>3</sub>		H <sub>2</sub> SC NaOI	NaOH HCI MeOH		Tota	Anions	TDS	Alka					REMARKS
	22-0441-01	5/9/2)	0705	GW	JCW-MW-18001		5	4	1				x	x	x	x					
	-02	Sholar	6634	GW	JCW-MW-18004	,	5	4	1				x	x	x	x					
	-03	510155	POOT	GW	JCW-MW-18005		5	4	1				x	x	x	x					
	-04	5/9/25	1339	GW	JCW-MW-18006		5	4	1				x	x	x	x					
	-05	5/9/22	0805	GW	MW-50		5	4	1				x	x	x	x					
	-06	5/9/08	0917	GW	MW-51		5	4	1				x	x	x	x					
	-07	5/9/25	1020	GW	MW-52		5	4	1				x	x	x	x					
	-08	5/9/20	1109	GW	MW-53		5	4	1				x	x	x	x					
	-09	\$ 19135	1434	GW	MW-53R		-5	4	1				x	x	x	x					
	-10	5/9/35	1315	GW	MW-54R		5	4	1				x	x	x	x					
	-11	5/10/3	130	GW	MW-55		5	4	1				x	x	x	x					
	-12	5/10/28	1105	GW	OW-57R OUT		5	4	1				х	x	x	x					
	NQUISHED BY:	$\supset$	5/	PATE/	D 0730	RECEIVED BY:							Re	omMI	i on i	ce? 6	Yes 5.6	□ No			015402
						22-0441 Page 41	of 42						Te	mpera	ture:	J.=	6.0 3 051	°C	Ca	l. Due	: Date: 6-3-22

# **CHAIN OF CUSTODY**



### CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 2 of 2

SAMPLIN	NG SITE / CU	JSTOMER:			PROJECT NUMBER:	SAP CC or W	7O#:							A	NAI	YSI	SRE	OUES	STED	171	
Q2-2022	Weadock P	orewater Wells			22-0441 REQUESTER: Harold Register						0			st if M	ed)	QA REQUIREMENT:					
SAMPLIN	NG TEAM:				TURNAROUND TIME REQUIRED:  □ 24 HR □ 48 HR □ 3 DAYS □ ST.	THER_														□ NPDES ⊠ TNI	
SEND R	EPORT TO:	Caleb Batts			email:																□ ISO 17025
COI	PY TO:	Harold Registe	er		MATRIX CODES: GW = Groundwater OX = Other		1	CC	ONTA	AINE	ERS										☐ 10 CFR 50 APP. B
		TRC			GW = Groundwater OX = Other  WW = Wastewater SL = Sludge  W = Water / Aqueous Liquid A = Air			PRESERVATIVE			als								☐ INTERNAL INFO		
1	AB	SAMPLE COL	LECTION	XIX	S = Soil / General Solid   WP = Wipe   O = Oil   WT = Gene	eral Waste	TOTAL#	None HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaOH HCI		_	I Metals	suc		Alkalinity					□ OTHER		
	PLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOT	None	HNO	NaOF	HCI	MeOr	Total	Anions	TDS	Alka					REMARKS
22-0	0441-13	5/9/25	1357	GW	MW-58		5	4	1				х	x	х	x					
	-14	519/05		GW	DUP-JCW-LF-01		5	4	1				x	x	х	x					
	-15	5/9/05	_	GW	DUP-JCW-LF-02		5	4	1				x	x	x	x					
	-16	5/9/33	6705	GW	JCW-MW-18001 MS		4	3	1				x	x		x					
	-17	519/35	0705	GW	JCW-MW-18001 MSD		4	3	1				x	x		x					
	-18	sluls	1140	w	FB-01		2	1	1				х	x							
1	-19	lio by	113-	W	EB-01		2	1	1				х	x							
																F					
	Section Car								L,	Ш			202	100	20 200						
/	JISHED BY:	>	5/	DATE/	10 095°	ECHIVED BY:								MMI			Yes	: □ N	o N	м&те	#:_015402
													Ter	npera	iture:	4.0	-5.(	e°C	(	Cal. Du	ne Date: 6-3-22



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 25, 2022

Subject: RCRA GROUNDWATER MONITORING – DEK-JCW BACKGROUND WELLS – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

**Chemistry Project: 22-0443** 

TRC Environmental, Inc. conducted groundwater monitoring at the Karn/Weadock Background Wells area on 05/02/2022 and 05/03/2022, for the 2<sup>nd</sup> Quarter monitoring 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 05/04/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

### 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, 22<sup>nd</sup> 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:

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



# **Work Order Sample Summary**

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 JCW-DEK Background Wells

**Date Received:** 5/04/2022 **Chemistry Project:** 22-0443

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0443-01	MW-15002	Groundwater	05/02/2022 05:24 PM	DEK JCW Background
22-0443-02	MW-15008	Groundwater	05/02/2022 01:45 PM	DEK JCW Background
22-0443-03	MW-15016	Groundwater	05/03/2022 08:37 AM	DEK JCW Background
22-0443-04	MW-15019	Groundwater	05/02/2022 03:20 PM	DEK JCW Background
22-0443-05	DUP-Background	Groundwater	05/02/2022 12:00 AM	DEK JCW Background
22-0443-06	FB- Background	Water	05/02/2022 01:45 PM	DEK JCW Background

Report Date:

05/25/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15002
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-01
 Collect Time:
 05:24 PM

Mercury by EPA 7470A, Total, Aqueous	<b>S</b>			Aliquot #: 22-0	443-01-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Apper	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	443-01-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	14		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	682		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	103		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	238000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	3		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	3		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	16100		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	16		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	14		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	54		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	15		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	23		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyte	E List, CI, F,	SO4, Aqu	ieous	Aliquot #: 22-0	443-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	2210000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	6000		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	443-01-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	4240	J	mg/L	10.0	05/05/2022	AB22-0505-01

Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15008
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-02
 Collect Time:
 01:45 PM

5			Aliquot #: 22-0	443-02-C01-A01	Analyst: CLH
Result	Flag	Units	RL	Analysis Date	Tracking
ND		ug/L	0.2	05/10/2022	AB22-0510-04
ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	443-02-C01-A02	Analyst: EB
Result	Flag	Units	RL	Analysis Date	Tracking
ND		ug/L	1.0	05/11/2022	AB22-0511-14
2		ug/L	1.0	05/11/2022	AB22-0511-14
52		ug/L	5.0	05/11/2022	AB22-0511-14
ND		ug/L	1.0	05/11/2022	AB22-0511-14
112		ug/L	20.0	05/11/2022	AB22-0511-14
ND		ug/L	0.2	05/11/2022	AB22-0511-14
89500		ug/L	1000.0	05/12/2022	AB22-0511-14
1		ug/L	1.0	05/11/2022	AB22-0511-14
ND		ug/L	6.0	05/11/2022	AB22-0511-14
ND		ug/L	1.0	05/11/2022	AB22-0511-14
15500		ug/L	20.0	05/11/2022	AB22-0511-14
ND		ug/L	1.0	05/11/2022	AB22-0511-14
16		ug/L	10.0	05/11/2022	AB22-0511-14
ND		ug/L	5.0	05/11/2022	AB22-0511-14
5		ug/L	2.0	05/11/2022	AB22-0511-14
ND		ug/L	1.0	05/11/2022	AB22-0511-14
ND		ug/L	0.2	05/11/2022	AB22-0511-14
ND		ug/L	2.0	05/11/2022	AB22-0511-14
6		ug/L	2.0	05/11/2022	AB22-0511-14
ND		ug/L	10.0	05/11/2022	AB22-0511-14
e List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	443-02-C02-A01	Analyst: DMW
Result	Flag	Units	RL	Analysis Date	Tracking
197000		ug/L	1000.0	05/17/2022	AB22-0509-05
ND		-	1000.0		AB22-0509-05
4990		ug/L	1000.0	05/16/2022	AB22-0509-05
			Aliquot #: 22-0	443-02-C03-A01	Analyst: CET
Result	Flag	Units	RL	Analysis Date	Tracking
783	•			05/05/2022	Ū
	Result ND  ndix III-IV To  Result ND 2 52 ND 112 ND 89500 1 ND 15500 ND 16 ND 15500 ND 16 ND 0 16 ND 0 16 ND 0 17 ND 0 18 ND 0 18 ND 0 19 ND 0 19 ND 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ND  ndix III-IV Total Metals  Result Flag  ND  2  52  ND  112  ND  89500  1  ND  ND  15500  ND  16  ND  5  ND  ND  6  ND  ND  6  ND  ND  8  List, CI, F, SO4, Aqu  Result Flag  197000  ND  4990	Result         Flag         Units           ND         ug/L           Indix III-IV Total Metals         Exp           Result         Flag         Units           ND         ug/L           52         ug/L           ND         ug/L           112         ug/L           ND         ug/L           89500         ug/L           ND         ug/L	Result   Flag   Units   RL	ND

Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15016
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0443-03
 Collect Time:
 08:37 AM

Mercury by EPA 7470A, Total, Aqueous	S			Aliquot #: 22-0	443-03-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	otal Metals	s Ехр	Aliquot #: 22-0	443-03-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	8		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	72		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	329		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	216000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	5		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	8020		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	80		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	13		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	3		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqu	ieous	Aliquot #: 22-0	443-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	243000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	267000		ug/L	1000.0	05/17/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	443-03-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1390	J	mg/L	10.0	05/05/2022	AB22-0505-02

Report Date:

05/25/22



**Laboratory Services** 

A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

 Field Sample ID:
 MW-15019
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-04
 Collect Time:
 03:20 PM

Mercury by EPA 7470A, Total, Aqueous	3			Aliquot #: 22-0	443-04-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Apper	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	443-04-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	308		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	236		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	139000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	21000		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	12		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	8		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	3		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyte	e List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	443-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	324000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	62500		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	443-04-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1200	_	mg/L	10.0	05/05/2022	AB22-0505-02



**Laboratory Services** A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: 22-0443

Field Sample ID: **DUP-Background** 

Lab Sample ID: 22-0443-05 Matrix: Groundwater

Collect Date: 05/02/2022

Collect Time: 12:00 AM

Report Date:

05/25/22

Mercury by EPA 7470A, Total, Aq	ueous			Aliquot #: 22-	0443-05-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule	Appendix III-IV To	tal Metals	Ехр	Aliquot #: 22-	0443-05-C01-A02	Analyst: EB
Parameter(s)	Pocult	Flag	Unite	DI	Analysis Date	Tracking

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp			Aliquot #: 22-0	Analyst: EB	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2	ug/L	1.0	05/11/2022	AB22-0511-14
Barium	58	ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND	ug/L	1.0	05/11/2022	AB22-0511-14
Boron	125	ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND	ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	103000	ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	2	ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND	ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND	ug/L	1.0	05/11/2022	AB22-0511-14
Iron	16600	ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND	ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	17	ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND	ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	5	ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	ND	ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND	ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND	ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	6	ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND	ug/L	10.0	05/11/2022	AB22-0511-14

Anions by EPA 300.0 CCF	R Rule Analyte List, CI, F, S	O4, Aqueous	Aliquot #: 22-0	443-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Chloride	198000	ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND	ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	4950	ug/L	1000.0	05/16/2022	AB22-0509-05

Total Dissolved Solids by SM 2540C				Aliquot #: 22	-0443-05-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	786		mg/L	10.0	05/05/2022	AB22-0505-02





Field Sample ID: FB- Background

A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443** 

Collect Date: 05/02/2022 Collect Time: 01:45 PM

Report Date:

05/25/22

Lab Sample ID: 22-0443-06 Matrix: Water

Mercury         ND         ug/L           Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp         Aliquot           Parameter(s)         Result         Flag         Units         I           Antimony         ND         ug/L         ug/L           Arsenic         ND         ug/L         ug/L           Barium         ND         ug/L         ug/L           Beryllium         ND         ug/L         ug/L           Cadmium         ND         ug/L         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L         1           Cobalt         ND         ug/L         0           Copper         ND         ug/L         0	0.2 #: <b>22-04</b>	Analysis Date 05/10/2022  43-06-C01-A02  Analysis Date 05/11/2022	Tracking AB22-0510-04  Analyst: EB  Tracking
Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp         Aliquot           Parameter(s)         Result         Flag         Units         I           Antimony         ND         ug/L         ug/L           Arsenic         ND         ug/L         ug/L           Barium         ND         ug/L         ug/L           Beryllium         ND         ug/L         ug/L           Cadmium         ND         ug/L         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L         1           Cobalt         ND         ug/L         0           Copper         ND         ug/L         0	: <b>#: 22-04</b> 4 <b>RL</b> 1.0	43-06-C01-A02 Analysis Date	Analyst: EB
Parameter(s)         Result         Flag         Units         I           Antimony         ND         ug/L         ug/L           Arsenic         ND         ug/L         ug/L           Barium         ND         ug/L         ug/L           Beryllium         ND         ug/L         ug/L           Cadmium         ND         ug/L         ug/L           Cadmium         ND         ug/L         1           Chromium         ND         ug/L         1           Cobalt         ND         ug/L         0           Copper         ND         ug/L         0	<b>RL</b> 1.0	Analysis Date	-
Antimony         ND         ug/L           Arsenic         ND         ug/L           Barium         ND         ug/L           Beryllium         ND         ug/L           Boron         ND         ug/L           Cadmium         ND         ug/L           Calcium         ND         ug/L           Chromium         ND         ug/L           Cobalt         ND         ug/L           Copper         ND         ug/L	1.0	•	Tracking
Arsenic         ND         ug/L           Barium         ND         ug/L           Beryllium         ND         ug/L           Boron         ND         ug/L           Cadmium         ND         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L         1           Cobalt         ND         ug/L         1           Copper         ND         ug/L         1		05/11/2022	
Barium         ND         ug/L           Beryllium         ND         ug/L           Boron         ND         ug/L           Cadmium         ND         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L         1           Cobalt         ND         ug/L         0           Copper         ND         ug/L         0	1.0	00/11/2022	AB22-0511-14
Beryllium         ND         ug/L           Boron         ND         ug/L           Cadmium         ND         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L         1           Cobalt         ND         ug/L         1           Copper         ND         ug/L         1	-	05/11/2022	AB22-0511-14
Boron         ND         ug/L           Cadmium         ND         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L           Cobalt         ND         ug/L           Copper         ND         ug/L	5.0	05/11/2022	AB22-0511-14
Cadmium         ND         ug/L           Calcium         ND         ug/L         1           Chromium         ND         ug/L           Cobalt         ND         ug/L           Copper         ND         ug/L	1.0	05/11/2022	AB22-0511-14
Calcium         ND         ug/L         1           Chromium         ND         ug/L           Cobalt         ND         ug/L           Copper         ND         ug/L	20.0	05/11/2022	AB22-0511-14
Chromium         ND         ug/L           Cobalt         ND         ug/L           Copper         ND         ug/L	0.2	05/11/2022	AB22-0511-14
Cobalt ND ug/L Copper ND ug/L	0.000	05/12/2022	AB22-0511-14
Copper ND ug/L	1.0	05/11/2022	AB22-0511-14
-	6.0	05/11/2022	AB22-0511-14
	1.0	05/11/2022	AB22-0511-14
Iron ND ug/L	20.0	05/11/2022	AB22-0511-14
Lead ND ug/L	1.0	05/11/2022	AB22-0511-14
Lithium ND ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum ND ug/L	5.0	05/11/2022	AB22-0511-14
Nickel ND ug/L	2.0	05/11/2022	AB22-0511-14
Selenium ND ug/L	1.0	05/11/2022	AB22-0511-14
Silver ND ug/L	0.2	05/11/2022	AB22-0511-14
Thallium ND ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium ND ug/L	2.0	05/11/2022	AB22-0511-14
Zinc ND ug/L	10.0	05/11/2022	AB22-0511-14





**Report Date:** 05/25/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

# Chemistry Department

General Standard Operating Procedure

PROC CHEM-1,2.01 PAGE 1 OF 2 REVISION 2 ATTACHMENT A

TITI D.	CAMPIET	OC IN	SHIPMENT INSPE	CTION FORM
1111/1/2:	SAMPLE	()(T-1)V -	SHIPWENT INSPE	CHONFORM

Pi	oject Log-In Numbe	er: 22-04	43			
	spection Date:	5.4.22		Inspection By:	dmw	
	mple Origin/Projec				- K (41)	
	ipment Delivered B					
, Sa	Pony	FedEx V		USP	Α;	rborne
	Other/Hand Ca				- n	TOOTHO
			4708310	Shipping Form	Attached: Yes	No_
Sh	ipping Containers:	Enter the type and	l number of shipp	oing containers receiv	red,	
	Cooler V	Cardboard 1	Box	Custom Case	Envelo	pe/Mailer
	Loose/Unpack	aged Containers _		the state of the s		
Co	ondition of Shipmen	t: Enter the as-rec	eived condition of	of the shipment conta	iner.	
	Damaged Ship	ment Observed: N	lone 🗸	Dented	Le	aking
	Other					
Sh	ipment Security: En	nter if any of the stainers Received: (	37	Sealed V	e receipt.	
En	closed Documents:					
	CoC_V	Work Request		Air Data Sheet	Other	
Те	mperature of Conta				A	
Nu	As-Received T METELF 9 mber and Type of C	emperature <u>2.9</u> EDM DATC: Containers: Enter	- 4.7℃ 015402 the total number	Samples Received of 6.3.27 of sample containers	on Ice: Yes V No	)
	Container Typ	oe Water	Soil	Other	Broken	Leaking
pH paper	VOA (40mL or		-		_	1
2	Quart/Liter (g/p		_		-	_
CO+ NO: 13-640-50	9-oz (amber gla		_		_	_
0.0-14.0	2-oz (amber gla 125 mL (plastic					-
	24 mL vial (gla					
Lot: 222420	500 mL (plastic	e)				
Lot: 222420 EXP. 8.1.23	Other 250 MI p	lostic 5			_	

# **CHAIN OF CUSTODY**



# CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page of 1

SAMPLING SITE / CU Q2-2022 JCW-DEK		ells		PROJECT NUMBER: 22-0443	SAP CC or WC	_	11.5	C. An	1614				ANALYSIS REQUESTED (Attach List if More Space is Needed)						QA REQUIREMENT:	
SAMPLING TEAM:			Ħ	TURNAROUND TIME REQUIRED:	REQUESTER:			cegis	ter				,			space			□ NPD	
SEND REPORT TO:	Caleb Batts			email:	phone:													□ ISO	17025	
COPY TO:	Harold Regis	ter		MATRIX CODES:  GW = Groundwater OX = Other			CC	ONTA	INE	RS	1								□ 10 €	CFR 50 APP. B
	TRC			WW = Wastewater SL = Sludg W = Water / Aqueous Liquid A = Air		1	F	RES	ERV	ATI	VE	tals								☐ INTERNAL INFO
LAB	SAMPLE COLI	LECTION	RIX	S = Soil / General Solid WP = Wipe O = Oil WT = Gene		TOTAL #	63	3	H		<u>تا ت</u>	Total Metals	Anions	suo			□ OTHER			
SAMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TION 2		HNC	H <sub>2</sub> SO <sub>4</sub>	HCI	MeOF	Tot	Ani	TDS				R	EMARKS	
22-0443-01	5/2/22	1724	GW	MW-15002		4	3	1				x	x	x						
-02	5/2/22	1345	GW	MW-15008		4	3	1				х	x	x						
-03	5/3/202	837	GW	MW-15016		4	3	1				х	x	x						
-04	5/422	1520	GW	MW-15019		4	3	1				x	х	x						
-05	3/2/22	_	GW	DUP-Background		4	3	1				х	х	x						
-06	5/2/22	1345	w	FB- Background		1						x								
1																				
RELINQUISHED BY:		. 1	DATE/	TIME:	RECEIVED BY:							CO	MMI	NTS:						
Mismay	Sola va	BUT		5/3/22	ECOSX															
RELINQUISHED BY:		- 2	DATE/	TIME: R	RECEIVED BY:							100		on Ice					E#: 015	
Bel 5	<	e	5-0	t- 2022 10, 25	—							Ter	npera	ture: 2	4-4	f.6 °C	1	Cal. D	ue Date: _	6-3-22
				U <sub>2</sub>	22-0443 Page 13 o	f 13						-								



# **Environment Testing America**

# **ANALYTICAL REPORT**

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166413-1

Client Project/Site: Karn/Weadock CCR JCW Ash Pond

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/20/2022 8:22:00 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

.....LINKS

Review your project results through

**Have a Question?** 



Visit us at: www.eurofinsus.com/Env

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

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

2

3

4

6

7

10

13

14

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	21
QC Sample Results	22
QC Association Summary	24
Lab Chronicle	25
Certification Summary	29
Chain of Custody	30
Receipt Chacklists	37

6

4

R

9

1 U

12

13

114

# **Definitions/Glossary**

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

### **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

6

0

0

9

11

12

13

**Eurofins Canton** 

### **Case Narrative**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Job ID: 240-166413-1

**Laboratory: Eurofins Canton** 

**Narrative** 

Job Narrative 240-166413-1

### Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226\_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

### Receipt

The samples were received on 5/12/2022 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 0.8° C, 0.9° C and 1.8° C.

#### **RAD**

Method 903.0: Radium-226 batch 565788 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

JCW-MW-18001 (240-166413-1), JCW-MW-18004 (240-166413-2), JCW-MW-18005 (240-166413-3), JCW-MW-18006 (240-166413-4), MW-50 (240-166413-5), MW-51 (240-166413-6), MW-52 (240-166413-7), MW-53 (240-166413-8), MW-53R (240-166413-9), MW-54R (240-166413-10), MW-55 (240-166413-11), OW-57R- OUT (240-166413-12), DUP-01 (240-166413-13), EB-01 (240-166413-14), (LCS 160-565788/1-A), (LCSD 160-565788/2-A) and (MB 160-565788/23-A)

Method 904.0: Radium 228 Batch 160-569783: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. JCW-MW-18001 (240-166413-1), JCW-MW-18004 (240-166413-2), JCW-MW-18005 (240-166413-3), JCW-MW-18006 (240-166413-4), MW-50 (240-166413-5), MW-51 (240-166413-6), MW-52 (240-166413-7), MW-53 (240-166413-8), MW-53R (240-166413-9), MW-54R (240-166413-10), MW-55 (240-166413-11), OW-57R-OUT (240-166413-12), DUP-01 (240-166413-13), EB-01 (240-166413-14), (LCS 160-569783/2-A), (LCSD 160-569783/3-A) and (MB 160-569783/1-A)

Method PrecSep\_0: Radium-228 Prep Batch 160-565793

The following sample was prepared at a reduced aliquot due to Matrix: MW-55 (240-166413-11). A laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep\_0: The following samples are being re-extracted due to LCS/LCSD failure (low). Original batch 565793. JCW-MW-18001 (240-166413-1), JCW-MW-18004 (240-166413-2), JCW-MW-18005 (240-166413-3), JCW-MW-18006 (240-166413-4), MW-50 (240-166413-5), MW-51 (240-166413-6), MW-52 (240-166413-7), MW-53 (240-166413-8), MW-53R (240-166413-9), MW-54R (240-166413-10), MW-55 (240-166413-11), OW-57R- OUT (240-166413-12), DUP-01 (240-166413-13) and EB-01 (240-166413-14)

Method PrecSep\_0: Radium-228 prep batch 160-569783 Insufficient sample volume was available to perform a sample duplicate for the following samples: JCW-MW-18001 (240-166413-1), JCW-MW-18004 (240-166413-2), JCW-MW-18005 (240-166413-3), JCW-MW-18006 (240-166413-4), MW-50 (240-166413-5), MW-51 (240-166413-6), MW-52 (240-166413-7), MW-53 (240-166413-8), MW-53R (240-166413-9), MW-54R (240-166413-10), MW-55 (240-166413-11), OW-57R- OUT (240-166413-12), DUP-01 (240-166413-13) and EB-01 (240-166413-14). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep\_0: Radium-228 prep batch 160-569783. The following sample was prepared at a reduced aliquot due to Matrix: MW-55 (240-166413-11). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep STD: Radium-226 Prep Batch 160-565788. The following sample was prepared at a reduced aliquot due to Matrix: MW-55 (240-166413-11). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

-5

Job ID: 240-166413-1

4

5

6

0

10

11

13

14

# **Method Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Job ID: 240-166413-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

### **Protocol References:**

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

### Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# **Sample Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166413-1	JCW-MW-18001	Water	05/09/22 07:05	05/12/22 08:00
240-166413-2	JCW-MW-18004	Water	05/10/22 06:34	05/12/22 08:00
240-166413-3	JCW-MW-18005	Water	05/10/22 10:04	05/12/22 08:00
240-166413-4	JCW-MW-18006	Water	05/09/22 13:33	05/12/22 08:00
240-166413-5	MW-50	Water	05/09/22 08:00	05/12/22 08:00
240-166413-6	MW-51	Water	05/09/22 09:17	05/12/22 08:00
240-166413-7	MW-52	Water	05/09/22 10:20	05/12/22 08:00
240-166413-8	MW-53	Water	05/09/22 11:09	05/12/22 08:00
240-166413-9	MW-53R	Water	05/09/22 14:34	05/12/22 08:00
240-166413-10	MW-54R	Water	05/09/22 15:15	05/12/22 08:00
240-166413-11	MW-55	Water	05/10/22 08:12	05/12/22 08:00
240-166413-12	OW-57R- OUT	Water	05/10/22 11:05	05/12/22 08:00
240-166413-13	DUP-01	Water	05/08/22 00:00	05/12/22 08:00
240-166413-14	EB-01	Water	05/10/22 11:35	05/12/22 08:00

1

Job ID: 240-166413-1

1

5

6

Q

9

10

4 4

12

13

14

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: JCW-MW-18001

Lab Sample ID: 240-166413-1 Date Collected: 05/09/22 07:05

**Matrix: Water** 

Date Received: 05/12/22 08:00

Method: 903.0 -	Radium-226	(GFPC)								
		` ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0913	U	0.181	0.182	1.00	0.327	pCi/L	05/16/22 12:29	06/09/22 19:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.5		40 - 110					05/16/22 12:29	06/09/22 19:05	1
_										

Method: 904.0 -	Radium-228	(GFPC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.494		0.302	0.306	1.00	0.433	pCi/L	06/13/22 14:10	06/17/22 13:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.5		40 - 110					06/13/22 14:10	06/17/22 13:57	1
Y Carrier	86.4		40 - 110					06/13/22 14:10	06/17/22 13:57	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.586		0.352	0.356	5.00	0.433	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: JCW-MW-18004

Lab Sample ID: 240-166413-2 Date Collected: 05/10/22 06:34 **Matrix: Water** Date Received: 05/12/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.120	U	0.234	0.234	1.00	0.417	pCi/L	05/16/22 12:29	06/09/22 19:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.6		40 - 110					05/16/22 12:29	06/09/22 19:06	1

Method: 904.0 -	Radium-228	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.790		0.375	0.382	1.00	0.505	pCi/L	06/13/22 14:10	06/17/22 13:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					06/13/22 14:10	06/17/22 13:57	1
Y Carrier	84.1		40 - 110					06/13/22 14:10	06/17/22 13:57	1

	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.910	- Guarrier	0.442	0.448	5.00	0.505			06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: JCW-MW-18005

Date Collected: 05/10/22 10:04 Date Received: 05/12/22 08:00

Lab	Sample	ID: 240-1	166413-3
-----	--------	-----------	----------

**Matrix: Water** 

Method: 903.0 - Ra	dium-226	(GFPC)								
		` '	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.223	U	0.254	0.255	1.00	0.414	pCi/L	05/16/22 12:29	06/09/22 19:06	1
Carrier Ba Carrier	<b>%Yield</b> 88.5	Qualifier	Limits 40 - 110					<b>Prepared</b> 05/16/22 12:29	Analyzed 06/09/22 19:06	Dil Fac

Method: 904.0 -	Radium-228	(GFPC)								
		,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.400	U	0.335	0.337	1.00	0.521	pCi/L	06/13/22 14:10	06/17/22 13:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.8		40 - 110					06/13/22 14:10	06/17/22 13:57	1
Y Carrier	83.0		40 - 110					06/13/22 14:10	06/17/22 13:57	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	n- <b>22</b> 8					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.622		0.420	0.423	5.00	0.521	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

85.3

Client Sample ID: JCW-MW-18006

Ba Carrier

226 + 228

Lab Sample ID: 240-166413-4

40 - 110

Date Collected: 05/09/22 13:33 **Matrix: Water** Date Received: 05/12/22 08:00

Method: 903.0 - Radium-226 (GFPC) Total Count Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL**MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.223 U 0.255 0.256 1.00 0.416 pCi/L 05/16/22 12:29 06/09/22 19:06 Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac

Method: 904.0 - Radium-228 (GFPC) Count Total Uncert. Uncert. Result Qualifier Analyte  $(2\sigma + / -)$ RL**MDC** Unit **Prepared** Analyzed  $(2\sigma + / -)$ Dil Fac 0.467 U 0.518 pCi/L 06/13/22 14:10 06/17/22 13:57 Radium-228 0.341 0.344 1.00 Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 91.0 40 - 110 06/13/22 14:10 06/17/22 13:57 83.0 40 - 110 06/13/22 14:10 06/17/22 13:57 Y Carrier

Method: Ra226 Ra228 - Combined Radium-226 and Radium-228 Count Total Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL MDC Unit Prepared Analyzed Dil Fac 0.426 0.429 5.00 0.518 pCi/L 06/20/22 11:18 **Combined Radium** 0.690

**Eurofins Canton** 

05/16/22 12:29 06/09/22 19:06

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Lab Sample ID: 240-166413-5 **Client Sample ID: MW-50** 

Date Collected: 05/09/22 08:00 **Matrix: Water** Date Received: 05/12/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.282	U	0.218	0.219	1.00	0.310	pCi/L	05/16/22 12:29	06/09/22 19:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		40 - 110					05/16/22 12:29	06/09/22 19:07	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.236	U	0.297	0.298	1.00	0.493	pCi/L	06/13/22 14:10	06/17/22 13:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					06/13/22 14:10	06/17/22 13:57	1
Y Carrier	84.1		40 - 110					06/13/22 14:10	06/17/22 13:57	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.518		0.368	0.370	5.00	0.493	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

**Client Sample ID: MW-51** Lab Sample ID: 240-166413-6 Date Collected: 05/09/22 09:17

**Matrix: Water** 

Date Received: 05/12/22 08:00

JM-226	(GFPC)								
	` ,	Count Uncert.	Total Uncert.						
Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
0.109	U	0.237	0.237	1.00	0.423	pCi/L	05/16/22 12:29	06/09/22 19:38	1
%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
86.5		40 - 110					05/16/22 12:29	06/09/22 19:38	1
_	Result 0.109 %Yield	Result   Qualifier	Result 0.109         Qualifier Uncert.         (2σ+/-) 0.237           %Yield Qualifier Limits	Result 0.109         Qualifier Uncert.         (2σ+/-) (2σ+/-) (2σ+/-)           %Yield Qualifier Units         Limits	Result 0.109         Qualifier Uncert         (2σ+/-) (2σ+/-) (2σ+/-) (2σ+/-)         RL 0.237         1.00           %Yield Qualifier Units         Limits         Limits	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Count Uncert.   Uncert.	Count   Uncert.   Uncert.   Uncert.   Uncert.     Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Count   Uncert.   Count		
Method: 904.0 -	Radium-228	(GFPC)							
-----------------	------------	-----------	---------------	------------------	------	-------	-------	----------------	----------------
		. ,	Count Uncert.	Total Uncert.					
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed
Radium-228	0.467	U	0.328	0.331	1.00	0.494	pCi/L	06/13/22 14:10	06/17/22 13:58
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed
Ba Carrier	93.5		40 - 110					06/13/22 14:10	06/17/22 13:58
Y Carrier	84.5		40 - 110					06/13/22 14:10	06/17/22 13:58

Method: Ra226_Ra	228 - Con	nbined Ra	dium-226 a	nd Radium	<b>1-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	0.576		0.405	0.407	5.00	0.494	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: MW-52 Lab Sample ID: 240-166413-7

Matrix: Water

Date Collected: 05/09/22 10:20 Date Received: 05/12/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.451	U	0.331	0.334	1.00	0.489	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.3		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 -	Radium-228	(GFPC)								
		` ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.424	U	0.343	0.345	1.00	0.532	pCi/L	06/13/22 14:10	06/17/22 13:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.8		40 - 110					06/13/22 14:10	06/17/22 13:58	1
Y Carrier	83.7		40 - 110					06/13/22 14:10	06/17/22 13:58	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.875		0.477	0.480	5.00	0.532	pCi/L		06/20/22 11:18	1

6/20/2022

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: MW-53 Lab Sample ID: 240-166413-8

. Matrix: Water

Date Collected: 05/09/22 11:09 Date Received: 05/12/22 08:00

Method: 903.0 - F	Radium-226	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.406		0.245	0.247	1.00	0.312	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 -	Radium-228	(GFPC)								
		,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.419	U	0.335	0.337	1.00	0.518	pCi/L	06/13/22 14:10	06/17/22 13:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		40 - 110					06/13/22 14:10	06/17/22 13:58	1
Y Carrier	84.9		40 - 110					06/13/22 14:10	06/17/22 13:58	1

Wiethou. Razzo_Ra	220 - COII	ibined Rac	dium-226 a	nd Radium	1-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.824		0.415	0.418	5.00	0.518	pCi/L		06/20/22 11:18	1

2

3

5

7

8

10

11

13

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: MW-53R

Date Collected: 05/09/22 14:34 Date Received: 05/12/22 08:00

Lab Sample ID: 240-166413-9

**Matrix: Water** 

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.251	U	0.217	0.218	1.00	0.325	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.8		40 - 110					05/16/22 12:29	06/09/22 19:38	1

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.156	U	0.278	0.278	1.00	0.480	pCi/L	06/13/22 14:10	06/17/22 13:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110					06/13/22 14:10	06/17/22 13:58	1
Y Carrier	84.5		40 - 110					06/13/22 14:10	06/17/22 13:58	1

Method: Ra226_Ra2	28 - Con	nbined Rad	dium-226 a	nd Radium	1-228					
_			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.407	U	0.353	0.353	5.00	0.480	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

**Client Sample ID: MW-54R** 

Lab Sample ID: 240-166413-10 Date Collected: 05/09/22 15:15

**Matrix: Water** 

Method: 903.0 -	Radium-226	(GFPC)								
		` '	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00689	U	0.167	0.167	1.00	0.347	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		40 - 110					05/16/22 12:29	06/09/22 19:38	1
=										

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.153	U	0.317	0.317	1.00	0.552	pCi/L	06/13/22 14:10	06/17/22 14:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.3		40 - 110					06/13/22 14:10	06/17/22 14:00	1
Y Carrier	83.0		40 - 110					06/13/22 14:10	06/17/22 14:00	1

Method: Ra226_Ra2	28 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.146	U	0.358	0.358	5.00	0.552	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

**Client Sample ID: MW-55** Lab Sample ID: 240-166413-11

Date Collected: 05/10/22 08:12 **Matrix: Water** Date Received: 05/12/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.137	U	0.266	0.267	1.00	0.478	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.3		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.559	U	0.424	0.427	1.00	0.646	pCi/L	06/13/22 14:10	06/17/22 14:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					06/13/22 14:10	06/17/22 14:00	1
Y Carrier	84.5		40 - 110					06/13/22 14:10	06/17/22 14:00	1

Method: Ra226_Ra	228 - Con	bined Rad	dium-226 a	nd Radium	-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.696		0.501	0.504	5.00	0.646	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: OW-57R- OUT

Lab Sample ID: 240-166413-12 Date Collected: 05/10/22 11:05

**Matrix: Water** 

Method: 903.0 - R	adium-226	(GFPC)								
		` '	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.299	U	0.281	0.282	1.00	0.440	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.3		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 -	Radium-228	(GFPC)								
			Count Uncert.	Total Uncert.						
			Officert.	Officert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.160	U	0.312	0.312	1.00	0.539	pCi/L	06/13/22 14:10	06/17/22 14:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					06/13/22 14:10	06/17/22 14:00	1
Y Carrier	86.0		40 - 110					06/13/22 14:10	06/17/22 14:00	1

Method: Ra226_Ra2	28 - Con	bined Rad	dium-226 a	nd Radium	<b>-228</b>					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.459	U	0.420	0.421	5.00	0.539	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

**Client Sample ID: DUP-01** Lab Sample ID: 240-166413-13 Date Collected: 05/08/22 00:00

**Matrix: Water** 

dium-226	(GFPC)								
		Count	Total						
		Uncert.	Uncert.						
Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
0.256	U	0.200	0.201	1.00	0.287	pCi/L	05/16/22 12:29	06/09/22 19:38	1
%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
94.8		40 - 110					05/16/22 12:29	06/09/22 19:38	1
	Result 0.256	dium-226 (GFPC)  Result Qualifier 0.256 U  %Yield Qualifier 94.8	Count Uncert.	Count Uncert. Uncert.	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Count   U	Count   Total   Uncert.   Uncert.   Uncert.   Uncert.   Uncert.   O.256   U   O.200   O.201   O.201   O.287     WYield   Qualifier   Limits   Limits   Limits   Limits   Count   O.201   O.	Count   Total   Uncert.   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Uncert.   Uncert.     Uncert.   Uncert.   Uncert.     O.256   U   O.200   O.201   O.201   O.287   PCi/L   O.287   Prepared   O.287   Prepared   O.298   O.299   O	Count   Uncert.   Uncert.   Uncert.   Uncert.     Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Uncert.   Uncert.   Count   Uncert.   Count   Uncert.   Count   Unit   Prepared   Analyzed   Analyzed   O.256   U   O.200   O.201   O.201   O.287   PCi/L   O.287   O.267	
Method: 904.0 -	Radium-228	(GFPC)							
-----------------	------------	-----------	------------------	------------------	------	-------	-------	----------------	----------------
Amaluta	Dogult.	Qualifier	Count Uncert.	Total Uncert.	DI	MDC	11-4	Dranavad	Analyzad
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL _	MDC	Unit	Prepared	Analyzed
Radium-228	0.648		0.347	0.352	1.00	0.482	pCi/L	06/13/22 14:10	06/17/22 14:01
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed
Ba Carrier	92.3		40 - 110					06/13/22 14:10	06/17/22 14:01
Y Carrier	85.2		40 - 110					06/13/22 14:10	06/17/22 14:01

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radiun	1-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	0.904		0.401	0.405	5.00	0.482	pCi/L		06/20/22 11:18	1

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

**Client Sample ID: EB-01** Lab Sample ID: 240-166413-14 Date Collected: 05/10/22 11:35 **Matrix: Water** 

Method: 903.0 - I	Radium-226	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.178	U	0.157	0.157	1.00	0.416	pCi/L	05/16/22 12:29	06/09/22 19:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		40 - 110					05/16/22 12:29	06/09/22 19:38	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.152	U	0.290	0.291	1.00	0.504	pCi/L	06/13/22 14:10	06/17/22 14:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.0		40 - 110					06/13/22 14:10	06/17/22 14:01	1
Y Carrier	83.4		40 - 110					06/13/22 14:10	06/17/22 14:01	1

Method: Ra226_Ra2	228 - Con	bined Rad	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0256	U	0.330	0.331	5.00	0.504	pCi/L		06/20/22 11:18	1

# **Tracer/Carrier Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Method: 903.0 - Radium-226 (GFPC)

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

_			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166413-1	JCW-MW-18001	86.5	
240-166413-2	JCW-MW-18004	74.6	
240-166413-3	JCW-MW-18005	88.5	
240-166413-4	JCW-MW-18006	85.3	
240-166413-5	MW-50	87.0	
240-166413-6	MW-51	86.5	
240-166413-7	MW-52	74.3	
240-166413-8	MW-53	84.8	
240-166413-9	MW-53R	90.8	
240-166413-10	MW-54R	87.0	
240-166413-11	MW-55	77.3	
240-166413-12	OW-57R- OUT	91.3	
240-166413-13	DUP-01	94.8	
240-166413-14	EB-01	84.8	
LCS 160-565788/1-A	Lab Control Sample	99.0	
LCSD 160-565788/2-A	Lab Control Sample Dup	96.8	
MB 160-565788/23-A	Method Blank	69.1	
Tracer/Carrier Legenc	I		
Ba = Ba Carrier	•		

Method: 904.0 - Radium-228 (GFPC)

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

				Percent Yield (Acceptance Limits)
		Ва	Υ	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-166413-1	JCW-MW-18001	93.5	86.4	
240-166413-2	JCW-MW-18004	90.0	84.1	
240-166413-3	JCW-MW-18005	88.8	83.0	
240-166413-4	JCW-MW-18006	91.0	83.0	
240-166413-5	MW-50	93.0	84.1	
240-166413-6	MW-51	93.5	84.5	
240-166413-7	MW-52	88.8	83.7	
240-166413-8	MW-53	90.5	84.9	
240-166413-9	MW-53R	92.3	84.5	
240-166413-10	MW-54R	87.3	83.0	
240-166413-11	MW-55	93.0	84.5	
240-166413-12	OW-57R- OUT	93.0	86.0	
240-166413-13	DUP-01	92.3	85.2	
240-166413-14	EB-01	91.0	83.4	
LCS 160-569783/2-A	Lab Control Sample	97.3	83.7	
LCSD 160-569783/3-A	Lab Control Sample Dup	96.3	84.1	
MB 160-569783/1-A	Method Blank	99.5	84.9	

Ba = Ba Carrier Y = Y Carrier

Client: TRC Environmental Corporation.

Count

Project/Site: Karn/Weadock CCR JCW Ash Pond

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-565788/23-A

**Matrix: Water** 

**Matrix: Water** 

Analysis Batch: 569248

Analysis Batch: 569248

Client Sample ID: Method Blank

Prep Type: Total/NA

Job ID: 240-166413-1

**Prep Batch: 565788** 

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.03434 U 0.165 0.165 1.00 0.332 pCi/L 05/16/22 12:29 06/09/22 21:14

Total

MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 69.1 40 - 110 05/16/22 12:29 06/09/22 21:14

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 565788** 

Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL %Rec Limits MDC Unit Radium-226 11.3 9.157 1.21 1.00 0.269 pCi/L 75 - 125

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 99.0 40 - 110

Lab Sample ID: LCS 160-565788/1-A

Lab Sample ID: LCSD 160-565788/2-A

**Matrix: Water** 

**Analysis Batch: 569248** 

**Client Sample ID: Lab Control Sample Dup** 

Prep Type: Total/NA

**Prep Batch: 565788** 

Total LCSD LCSD %Rec **RER** Spike Uncert. %Rec Added  $(2\sigma + / -)$ RL **MDC** Unit Limits Analyte Result Qual RER Limit Radium-226 11.3 8.743 1.18 1.00 0.355 pCi/L 75 - 125 0.17

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 96.8 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-569783/1-A

**Matrix: Water** 

Analysis Batch: 570480

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

**Prep Batch: 569783** 

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed Radium-228 Ū 0.220 0.220 1.00 0.445 pCi/L 06/13/22 14:10 06/17/22 13:57 -0.08470

> MB MB

Carrier %Yield Qualifier Limits Dil Fac Prepared Analyzed Ba Carrier 99.5 40 - 110 06/13/22 14:10 06/17/22 13:57 40 - 110 Y Carrier 84.9 06/13/22 14:10 06/17/22 13:57

# **QC Sample Results**

Client: TRC Environmental Corporation. Job ID: 240-166413-1

Project/Site: Karn/Weadock CCR JCW Ash Pond

# Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-569783/2-A **Client Sample ID: Lab Control Sample** 

**Matrix: Water** 

Analysis Batch: 570480

**Prep Type: Total/NA** 

**Prep Batch: 569783** 

				Total					
	Spike	LCS	LCS	Uncert.					%Rec
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC U	Jnit	%Rec	Limits
Radium-228	8.53	8.634		1.19	1.00	0.503 p	Ci/l	101	75 - 125

LCS LCS

Carrier	%Yield	Qualifier	Limits
Ba Carrier	97.3		40 - 110
Y Carrier	83.7		40 - 110

Lab Sample ID: LCSD 160-569783/3-A **Client Sample ID: Lab Control Sample Dup** 

**Matrix: Water** 

**Analysis Batch: 570480** 

**Prep Type: Total/NA** 

**Prep Batch: 569783** 

				Total						
	Spike	LCSD	LCSD	Uncert.				%Rec		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	RER	Limit
Radium-228	8.53	7.654		1.08	1.00	0.436 pCi/L	90	75 - 125	0.43	1

LCSD LCSD

Carrier	%Yield	Qualifier	Limits
Ba Carrier	96.3		40 - 110
Y Carrier	84.1		40 - 110

# **QC Association Summary**

Client: TRC Environmental Corporation. Project/Site: Karn/Weadock CCR JCW Ash Pond

Job ID: 240-166413-1

### **Prep Batch: 565788**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166413-1	JCW-MW-18001	Total/NA	Water	PrecSep STD	
240-166413-2	JCW-MW-18004	Total/NA	Water	PrecSep STD	
240-166413-3	JCW-MW-18005	Total/NA	Water	PrecSep STD	
240-166413-4	JCW-MW-18006	Total/NA	Water	PrecSep STD	
240-166413-5	MW-50	Total/NA	Water	PrecSep STD	
240-166413-6	MW-51	Total/NA	Water	PrecSep STD	
240-166413-7	MW-52	Total/NA	Water	PrecSep STD	
240-166413-8	MW-53	Total/NA	Water	PrecSep STD	
240-166413-9	MW-53R	Total/NA	Water	PrecSep STD	
240-166413-10	MW-54R	Total/NA	Water	PrecSep STD	
240-166413-11	MW-55	Total/NA	Water	PrecSep STD	
240-166413-12	OW-57R- OUT	Total/NA	Water	PrecSep STD	
240-166413-13	DUP-01	Total/NA	Water	PrecSep STD	
240-166413-14	EB-01	Total/NA	Water	PrecSep STD	
MB 160-565788/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-565788/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-565788/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

### Prep Batch: 569783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166413-1	JCW-MW-18001	Total/NA	Water	PrecSep_0	
240-166413-2	JCW-MW-18004	Total/NA	Water	PrecSep_0	
240-166413-3	JCW-MW-18005	Total/NA	Water	PrecSep_0	
240-166413-4	JCW-MW-18006	Total/NA	Water	PrecSep_0	
240-166413-5	MW-50	Total/NA	Water	PrecSep_0	
240-166413-6	MW-51	Total/NA	Water	PrecSep_0	
240-166413-7	MW-52	Total/NA	Water	PrecSep_0	
240-166413-8	MW-53	Total/NA	Water	PrecSep_0	
240-166413-9	MW-53R	Total/NA	Water	PrecSep_0	
240-166413-10	MW-54R	Total/NA	Water	PrecSep_0	
240-166413-11	MW-55	Total/NA	Water	PrecSep_0	
240-166413-12	OW-57R- OUT	Total/NA	Water	PrecSep_0	
240-166413-13	DUP-01	Total/NA	Water	PrecSep_0	
240-166413-14	EB-01	Total/NA	Water	PrecSep_0	
MB 160-569783/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-569783/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-569783/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

**Eurofins Canton** 

6/20/2022

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: JCW-MW-18001

Date Collected: 05/09/22 07:05 Date Received: 05/12/22 08:00

Lab Sample ID: 240-166413-1

**Matrix: Water** 

Job ID: 240-166413-1

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569248	06/09/22 19:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:57	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Client Sample ID: JCW-MW-18004

Date Collected: 05/10/22 06:34

Date Received: 05/12/22 08:00

Lab Sample ID: 240-166413-2

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:57	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Client Sample ID: JCW-MW-18005

Date Collected: 05/10/22 10:04

Date Received: 05/12/22 08:00

Lab Sample ID: 240-166413-3

**Matrix: Water** 

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:57	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Client Sample ID: JCW-MW-18006

Date Collected: 05/09/22 13:33

Date Received: 05/12/22 08:00

 0	
Lab	Sample ID: 240-166413-4
	Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:06	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:57	CLP	TAL SL
Total/NA	Analysis	Ra226 Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Page 25 of 37

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

**Client Sample ID: MW-50** Lab Sample ID: 240-166413-5

Date Collected: 05/09/22 08:00 **Matrix: Water** Date Received: 05/12/22 08:00

Batch Batch Dilution Batch **Prepared Prep Type** Method or Analyzed Analyst Type Run **Factor** Number Lab Total/NA PrecSep STD 565788 05/16/22 12:29 TAL SL Prep Total/NA Analysis 903.0 569247 06/09/22 19:07 FLC TAL SL 1 Total/NA Prep PrecSep 0 569783 06/13/22 14:10 MS TAL SL Total/NA 904.0 TAL SL Analysis 1 570480 06/17/22 13:57 CLP

Client Sample ID: MW-51 Lab Sample ID: 240-166413-6

Date Collected: 05/09/22 09:17 **Matrix: Water** 

570750 06/20/22 11:18 FLC

Date Received: 05/12/22 08:00

Analysis

Ra226 Ra228

Total/NA

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:58	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Lab Sample ID: 240-166413-7 Client Sample ID: MW-52

Date Collected: 05/09/22 10:20

Date Received: 05/12/22 08:00

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:58	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

**Client Sample ID: MW-53** Lab Sample ID: 240-166413-8 Date Collected: 05/09/22 11:09 **Matrix: Water** 

Date Received: 05/12/22 08:00

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570480	06/17/22 13:58	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

**Eurofins Canton** 

Page 26 of 37

Job ID: 240-166413-1

TAL SL

**Matrix: Water** 

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Lab Sample ID: 240-166413-9 Client Sample ID: MW-53R Date Collected: 05/09/22 14:34

**Matrix: Water** Date Received: 05/12/22 08:00

Batch Batch Dilution Batch **Prepared** Method or Analyzed **Prep Type** Type Run **Factor** Number Analyst Lab Total/NA PrecSep STD 565788 05/16/22 12:29 TAL SL Prep Total/NA 903.0 569247 06/09/22 19:38 FLC TAL SL Analysis 1 PrecSep\_0 Total/NA Prep 569783 06/13/22 14:10 MS TAL SL Total/NA Analysis 904.0 1 570480 06/17/22 13:58 CLP TAL SL Total/NA Analysis Ra226 Ra228 570750 06/20/22 11:18 FLC TAL SL

Client Sample ID: MW-54R Lab Sample ID: 240-166413-10

Date Collected: 05/09/22 15:15 **Matrix: Water** 

Date Received: 05/12/22 08:00

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570479	06/17/22 14:00	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

**Client Sample ID: MW-55** Lab Sample ID: 240-166413-11

Date Collected: 05/10/22 08:12 **Matrix: Water** Date Received: 05/12/22 08:00

Dilution Batch Batch Batch **Prepared** Method **Prep Type** Type Run **Factor** Number or Analyzed Analyst Lab Prep Total/NA PrecSep STD 565788 05/16/22 12:29 MS TAL SL Total/NA Analysis 903.0 569247 06/09/22 19:38 FLC TAL SL 1 Total/NA Prep PrecSep 0 569783 06/13/22 14:10 MS TAL SL Total/NA 904.0 570479 06/17/22 14:00 CLP TAL SL Analysis 1 Total/NA Analysis Ra226 Ra228 1 570750 06/20/22 11:18 FLC TAL SL

Client Sample ID: OW-57R- OUT Lab Sample ID: 240-166413-12

Date Collected: 05/10/22 11:05 **Matrix: Water** Date Received: 05/12/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570479	06/17/22 14:00	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Job ID: 240-166413-1

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Client Sample ID: DUP-01 Lab Sample ID: 240-166413-13

Date Collected: 05/08/22 00:00 Matrix: Water Date Received: 05/12/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570479	06/17/22 14:01	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

Client Sample ID: EB-01 Lab Sample ID: 240-166413-14

Date Collected: 05/10/22 11:35

Date Received: 05/12/22 08:00

Matrix: Water

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			565788	05/16/22 12:29	MS	TAL SL
Total/NA	Analysis	903.0		1	569247	06/09/22 19:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			569783	06/13/22 14:10	MS	TAL SL
Total/NA	Analysis	904.0		1	570479	06/17/22 14:01	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	570750	06/20/22 11:18	FLC	TAL SL

**Laboratory References:** 

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 240-166413-1

3

4

**O** 

9

11

12

13

# **Accreditation/Certification Summary**

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR JCW Ash Pond

Job ID: 240-166413-1

## **Laboratory: Eurofins St. Louis**

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	<b>Identification Number</b>	<b>Expiration Date</b>
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

-0

4

8

9

*A A* 

12

Client Information Client Conlact Jacob Krenz Company				
Dient Contact Jacob Krenz Company	Sampler	Lab PM Brooks, Kris M	Carner Tracking No(s)	COC No 240-94784-33306.2
Company	Phone	E-Mail Kris Brooks@et.eurofinsus.com	State of Origin	Page Page 2 of 2
TRC Environmental Corporation	QISMd	Ana	Analysis Requested	Job #
Address 1540 Eisenhower Place	Due Date Requested:			2.72
City. Ann Arbor	TAT Requested (days):			B - NBCH N - NBCH B - NBCH N - NBCH C - Zh Acatata
State, Ztp MI, 48108-7080	Compliance Project: A Yes A No			
Phone 734-971-7080(Tel) 734-971-9022(Fax)	PO# TBD	(6		
Email JKrenz@trccompanies.com	WO #			J. Di Water V
Project Name Karn/Weadock CCR JCW Ash Pond	Project # 24024154	bC se ou		K EDTA
Site	SSOW#	10_85 SD (Ye		Other:
	Sample	Owesteel 10 - Standard		) tedmuM ls:
Sample identification	Sample Date Time G=grab)	Stentrum Andry in 0.90		Special Instructions/Note:
OW-57R OUT	5/10/12 (1.05 (s	13		C
DUP-01	1	7		sch
EB-01	SID(2) (135 G	5		
		Water		
		Water		
		Water		
		Sample Disposal ( A fe	e may the assessed if samples are	retained longer than 1 month)
Non-Hazard Flammable Skin Imtant Deliverable Reminested 1 II III V Other reneates	Poison B Unknown Radiological		Return To Client Disposal By Lab Archive For Mont	Archive For Months
Emoto We Delicated by		Special instructions/QC Requirements	. Г	
Reinquisted by	Detertime	Company Received by 14/1	Method of Shipment	
Reinquished by			R	5/11/23 QBA
Reimquished by	Date/Time 5/11/32 0830	Company Received by	Detections	822 800 Company
Custody Seals Intact: Custody Seal No.		Cooler Temperature(s) "C and Other Remarks	2 and Other Remarks.	

ŧ	Û	

1	3

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Canton Facility	Login # : 166413
Client TRC Site Name	Cooler unpacked by:
Cooler Received on 5 12 22 Opened on 5 12 22	Math
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier	Other
Receipt After-hours: Drop-off Date/Time Storage Location	
TestAmerica Cooler # Foam Box Client Cooler Box Other	
COOLANT: Wet Ice Blue Ice Dry Ice Water None	
1. Cooler temperature upon receipt See Multiple Cooler F	
IR GUN# IR-13 (CF 0.0 °C) Observed Cooler Temp. °C Corrected Cooler 7. IR GUN #IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler	
	Tests that are not
	No NA checked for pH by
	Receiving:
	No NA
	VOAs Oil and Grease
	S NO TOC
	s No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	
	No No
	No No
9. For each sample, does the COC specify preservatives (YN), # of containers (YN), and s	
	No No
	No No
·	es No
If yes, Questions 13-17 have been checked at the originating laboratory.	S No NA pH Strip Lot# HC157842
	es No NA ph strip Lot# <u>HC137642</u>
	s No NA
	s No
	es No
	9
Contacted PM Date by via Verbal V	Voice Mail Other
Concerning	
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES  additional next page	Samples processed by:
Reciered 7 sets of Samoles	Jahle a
	10000
18006, one with time 1004	OIK 13335
motched times with cos , sor	ne with
Gamples MW.50 and	
19. SAMPLE CONDITION	
Sample(s) were received after the recommended hole	
	d in a broken container.
Sample(s) were received with bubble >6 mm	in diameter. (Notify PM)
20. SAMPLE PRESERVATION	
Sample(s) were fi	orther preserved in the laboratory.
Sample(s) were full Time preserved:Preservative(s) added/Lot number(s):	F
VOA Sample Preservation - Date/Time VOAs Frozen:	
	The state of the s

Cooler Description   R. Gum   Observed   Corrected   Colant						
Circle   Circle   Circle   Temp *C		<b>Eurofins - Canto</b>	n Sample Receipt Mu	Itiple Cooler Form		
Ciert   Box Other   St.   Dis.   St.   S						
12   12   13   15   15   15   15   15   15   15	(C	ircle)	(Circle)	Temp °C	Temp °C	
A Client   Sox Other	TA Client	Box Other		1.8	1.8	Water None
TA   Clear   Box   Other   Third   T	TA Client	Box Other	1R-18 IR-15	0.9	0.9	,
TA Cleent Box Other   IR-13   IR-15	TA Client	Box Other	IR-13 IR-15	0.8	0.8	
TA   Clent   Box   Other   IR-13   IR-15	TA Client	Box Other	1R-13 IR-15			, , , , , , , , , , , , , , , , , , , ,
TA CBert   Box Other   IR-13   IR-15   Welter   Blue ice   Dry ice   Worder   Mone   Worder   Mone   Welter   Blue ice   Dry ice   Welter   Blue ice   Dry ice   Welter   Welter   Welter   Blue ice   Dry ice   Welter   Welter   Welter   Welter   Welter   Blue ice   Dry ice   Welter   Blue ice   Dry ice   Welter   We	TA Client	Box Other	IR-13 IR-15			
TA CBert   Box Other   IR-13   IR-15   Wellice   Blue lice   Dry Ice   Wellice   Blue lice	TA Client	Box Other	IR-13 IR-15			
TA CBent   Box Other   R-13   R-15    TA Client	Box Other	IR-13 IR-15				
TA CBert   Box Other   R-13   R-15	TA Client	Box Other	IR-13 IR-15			
TA Client   Box Other   IR-13   IR-15	TA Client	Box Other	IR-13 IR-15			
TA Client	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client   Box Other   IR-13   IR-15	TA Client	Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice
TA	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other   IR-13 IR-15   Wet Ice Blue Ice Dry Ice Worder None   IR-13 IR	TA Client	Box Other	IR-13 IR-15			
TA   Client   Box   Other   IR-13   IR-15	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA         Client         Box         Other         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           Worder         None         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           Worder         None         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           Worder         None         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           Worder         None         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wel Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client   Box Other   IR-13   IR-15   Wet Ice   Blue Ice   Dry Ice   Worler   None	TA Client	Box Other	IR-13 IR-15			
TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           Water         None         Wet Ice         Blue Ice         Dry Ice         Water         None           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           Water         None         Wet Ice         Blue Ice         Dry Ice         Water         None           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           Water         None         Wet Ice         Blue Ice         Dry Ice         Water None         Wet Ice         Blue Ice         Dry Ice         Water None         Wet Ice         B	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           Worder         None         Wet Ice         Blue Ice         Dry Ice         Worder         None           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA </td <td>TA Client</td> <td>Box Other</td> <td>IR-13 IR-15</td> <td></td> <td></td> <td>Wet Ice Blue Ice Dry Ice</td>	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ice           TA         Client         Box         Other         IR-13         IR-15         Wet Ice         Blue Ice         Dry Ic	TA Client	Box Other	IR-13 IR-15			
TA Client   Box Other   IR-13   IR-15   Wel ice   Blue ice   Dry ice   Water   None	TA Client	Box Other	IR-13 IR-15			
TA Client Box Other   IR-13 IR-15   Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			
TA Client Box Other   IR-13 IR-15   Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			1
TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			
TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice
TA Client Box Other IR-13 IR-15  TA Client Box Other IR-13 IR-15	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15  TA Client Box Other IR-13 IR-15	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15  TA Client Box Other IR-13 IR-15	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15  Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None  TA Client Box Other IR-13 IR-15 Wet ice Blue ice Dry ice Water None	TA Client	Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice
TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None  Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other IR-13 IR-15 Wet Ice Blue Ice Dry Ice Water None	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
	TA Client	Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
					☐ See Tem	

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

# **Login Container Summary Report**

240-166413

Temperature readings:				
remperature readings			Container Preservative	
Client Sample ID	Lab ID	Container Type	pH Temp Added (mls) Lot #	
JCW-MW-18001	240-166413-A-1	Plastic 1 liter - Nitric Acid	<2	- 5
JCW-MW-18001	240-166413-B-1	Plastic 1 liter - Nitric Acid	<2	
JCW-MW-18004	240-166413-A-2	Plastic 1 liter - Nitric Acid	<2	6
JCW-MW-18004	240-166413-B-2	Plastic 1 liter - Nitric Acid	<2	7
JCW-MW-18005	240-166413-A-3	Plastic 1 liter - Nitric Acid	<2	
JCW-MW-18005	240-166413-B-3	Plastic 1 liter - Nitric Acid	<2	8
JCW-MW-18006	240-166413-A-4	Plastic 1 liter - Nitric Acid	<2	9
JCW-MW-18006	240-166413-B-4	Plastic 1 liter - Nitric Acid	<2	
MW-50	240-166413-A-5	Plastic 1 liter - Nitric Acid	<2	10
MW-50	240-166413-B-5	Plastic 1 liter - Nitric Acid	<2	11
MW-51	240-166413-A-6	Plastic 1 liter - Nitric Acid	<2	- 11
MW-51	240-166413-B-6	Plastic 1 liter - Nitric Acid	<2	
MW-52	240-166413-A-7	Plastic 1 liter - Nitric Acid	<2	13
MW-52	240-166413-B-7	Plastic 1 liter - Nitric Acid	<2	14
MW-53	240-166413-A-8	Plastic 1 liter - Nitric Acid	<2	
MW-53	240-166413-B-8	Plastic 1 liter - Nitric Acid	<2	~
MW-53R	240-166413-A-9	Plastic 1 liter - Nitric Acid	<2	_
MW-53R	240-166413-B-9	Plastic 1 liter - Nitric Acid	<2	_
MW-54R	240-166413-A-10	Plastic 1 liter - Nitric Acid	<2	_
MW-54R	240-166413-B-10	Plastic 1 liter - Nitric Acid	<2	_
MW-55	240-166413-A-11	Plastic 1 liter - Nitric Acid	<2	_
MW-55	240-166413-B-11	Plastic 1 liter - Nitric Acid	<2	_
OW-57R- OUT	240-166413-A-12	Plastic 1 liter - Nitric Acid	<2	_
OW-57R- OUT	240-166413-B-12	Plastic 1 liter - Nitric Acid	<2	_
DUP-01	240-166413-A-13	Plastic 1 liter - Nitric Acid	<2	_
DUP-01	240-166413-B-13	Plastic 1 liter - Nitric Acid	<2	_
EB-01	240-166413-A-14	Plastic 1 liter - Nitric Acid	<2	-
EB-01	240-166413-B-14	Plastic 1 liter - Nitric Acid	<2	-

Page 1 of 1

Cooler Temperature(s) °C and Other Remarks:

13

1022 0850 Compan

💸 eurofins | Environment Testing | America

**Chain of Custody Record** 

**Eurofins Canton** 

	O	hain	of Cus	Chain of Custody Record	ecol	P						💸 eurofins	NS Environment Testing	sting
Parizerron, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772						<b>,</b>							America	
Client Information (Sub Contract Lab)	Sampler:			Lab PM Brooks	Lab PM: Brooks, Kris M	Σ			రొ	Carrier Tracking No(s)	)(s):	COC No. 240-151953.1	-	
Client Contact: Shipping/Receiving	Phone:			E-Mail: Kris.B	E-Mail: Kris.Brooks@et.eurofinsus.com	get.eu	susuijo	mos.	Z SE	State of Origin: Michigan		Page: Page 1 of 2		
Сомралу: TestAmerica Laboratories, Inc.					Accreditations Required (See note)	tions Re	quired (S	ee note):				Job #:		
Address: 13715 Rider Trail North.	Due Date Requested: 6/13/2022							Analys	Analysis Reguested	stad		Preservation Codes	Codes:	
City. Earth City	TAT Requested (days):	::				$\vdash$						A - HCL B - NaOH	M - Hexane N - None	
State, Ztp. MO, 63045	T					_						C - Zn Acetate D - Nitric Acid F - NaHSO4	O - AsNaO2 P - Na2O4S	
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	# Od											F - MeOH G - Amchlor		
Email:	*OM											H - Ascorbic Acid I - Ice	ord T - TSP Dodecahydrate U - Acetone	rate
Project Name: Karn/Weadock CCR Groundwater Monitoring	Project #: 24024154				¥ 50 € 30,1) €	bisbri 						K-EDTA L-EDA	W - pH 4-5 Z - other (specify)	
Site.	#MOSS						ьс					d cont		
			Sample	Matrix			28_GF					upes o		
		Sample	Type (C=comp,	(Wawater, Sesolid, Onwasta/oll,			26Ra2					nuN ls		
Sample Identification - Client ID (Lab ID)	Sample Date	Time	- 8	BT=Tissue, A=Air)	냳	-	Ra						Special Instructions/Note:	
	X	X	Preserva	Preservation Code:	X							/\ ×		
JCW-MW-18001 (240-166413-1)	5/9/22	07:05 Eastern		Water		×	×					2 TVA protocol	TVA protocol - Ra-226+228 action limit at	at a
JCW-MW-18004 (240-166413-2)	5/10/22	06:34 Fastem		Water		×	×					2 TVA protocol	TVA protocol - Ra-226+228 action limit at	t at
JCW-MW-18005 (240-166413-3)	5/10/22	10:04 Fastern		Water		×	×					2 TVA protocol	TVA protocol - Ra-226+228 action limit at	# #
JCW-MW-18006 (240-166413-4)	5/9/22	13:33 Eactorn		Water		×	×		-			2 TVA protocol	5.0 pcirt. TVA protocol - Ra-226+228 action limit at	tat
MW-50 (240-166413-5)	5/9/22	08:00		Water		×	×						5.0 pci/L. TVA protocol - Ra-226+228 action limit at	a d
MW-51 (240-166413-6)	5/9/22	09:17 Factors		Water		×	×				+		5.0 pcvl TVA protocol - Ra-226+228 action limit at	ta t
MW-52 (240-166413-7)	5/9/22	10:20 Fastern		Water		×	×	1					5.0 pCi/L. TVA protocol - Ra-226+228 action limit at	t at
MW-53 (240-166413-8)	5/9/22	11:09 Fastern		Water		×	×	H			-		TVA protocol - Ra-226+228 action limit at	at
MW-53R (240-166413-9)	5/9/22	14:34 Eastern		Water		×	×					2 TVA protocol -	5.0 pC//l TVA protocol - Ra-226+228 action limit at 5.0 pC//l	tat
Note: Since abovatory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/rests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC abovatory 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 complicance to Eurofins Environment Testing North Central, LLC.	ant Testing North Central, above for analysis/tests/m entral, LLC attention imm	LLC places th atrix being and ediately. If all	e ownership calyzed, the sa	if method, ana mples must be reditations are	yte & accre shipped ba current to	date, ret	complian Eurofins um the si	se upon out Environme gned Chain	subcontract Is nt Testing No of Custody at	boratories. Thi th Central, LLC esting to said o	s sample ship laboratory or omplicance to	ment is forwarded und other instructions will b Eurofins Environment	er chain-of-custody. If the eprovided. Any changes to Testing North Central, LLC	
Possible Hazard Identification					Sam	ple Dis	posal	A fee m	y be asse	ssed if sam	ples are re	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	n 1 month)	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank	le Rank: 2				Retui	Return To Client	ient	Record Industrial College	Disposal By Lab	] [	Archive For	Months	
Emoty Kit Delinenished by		1			opder.		nonon	CC Ked	Jirements:					
Critiply Mt Relinquished by:		Date:			Time:					Method of Shipment	pment			
to the second se	5-12-22		944	Company F-A	<u>«</u>	Received by	ρλ:	!L	FED EX	Ö	Date/Time:		Company	

Custody Seal No.:

Custody Seals Intact:

FEDEX

Ver: 06/08/202

CARSO

2022 0850

MA Ve

Diena Worthington

Cooler Temperature(s) °C and Other Remarks:

Date/Time:

FEDEX

Received by:

ETA

944

Date/Time: 5-12-22 Date/Time:

Date/Time

FED EX

**Environment Testing** 🔅 eurofins

# Chain of Custody Record

Phone: 330-497-9396 Fax: 330-497-0772

180 S. Van Buren Avenue

Barberton, OH 44203

**Eurofins Canton** 

M - Hexane
N - None
O - Ashao2
P - Na2O4S
Q - Na2SO3
R - Na2S203
S - H2SO4
I - TSP Dodecahydrate
U - Acetone TVA protocol - Ra-226+228 action limit at 5.0 pCi/L. 5.0 pCi/L. TVA protocol - Ra-226+228 action limit at TVA protocol - Ra-226+228 action limit at 5.0 pCi/L. TVA protocol - Ra-226+228 action limit at TVA protocol - Ra-226+228 action limit at Vote: Since aboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the aboratory does not currently maintain accreditation in the State of Ongin listed above for analysis/leats/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC altention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC. Special Instructions/Note: Z - other (specify) W - pH 4-5 Months V - MCAA Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mon Preservation Codes C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid 240-151953.2 240-166413-1 Page: Page 2 of 2 J - DI Water A - HCL B - NaOH K - EDTA L - EDA 5.0 pCi/L 5.0 pCi/L Total Number of containers N 2 Method of Shipment: Carrier Tracking No(s) State of Origin: Michigan **Analysis Requested** Special Instructions/QC Requirements: Accreditations Required (See note) Kris.Brooks@et.eurofinsus.com Ra226Ra228\_GFPC × × × × × 904.0/PrecSep\_0 Standard Target List × × × × Lab PM: Brooks, Kris M × × × × × (det or 16) ime: (ON SO COL) OIG E-Mail BT=Tissue, A=Air) Preservation Code: Water Matrix Water Water Water Water Sample (C=comp, G=grab) Type Primary Deliverable Rank: 2 Eastern 08:12 Eastern 11:05 Eastern Sample Eastern Eastern Time 11:35 Date: 'AT Requested (days) Due Date Requested: 6/13/2022 Sample Date 5/10/22 5/10/22 Project # 24024154 SSOW# 5/9/22 5/8/22 5/10/22 Phone Client Information (Sub Contract Lab) Unconfirmed
Deliverable Requested: I, II, III, IV, Other (specify) Karn/Weadock CCR Groundwater Monitoring sample identification - Client ID (Lab ID) 314-298-8566(Tel) 314-298-8757(Fax) OW-57R- OUT (240-166413-12) Possible Hazard Identification TestAmerica Laboratories, Inc. Empty Kit Relinquished by: AW-54R (240-166413-10) DUP-01 (240-166413-13) WW-55 (240-166413-11) 13715 Rider Trail North, EB-01 (240-166413-14) Shipping/Receiving State, Zip: MO, 63045 Earth City

13

inquished by:

Custody Seal No.:

Custody Seals Intact:

# **Login Sample Receipt Checklist**

Client: TRC Environmental Corporation.

Job Number: 240-166413-1

Login Number: 166413 List Source: Eurofins St. Louis
List Number: 2 List Creation: 05/13/22 11:49 AM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins Canton
Page 37 of 37
6/20/2022



# **Environment Testing America**

# **ANALYTICAL REPORT**

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166150-1

Client Project/Site: CCR Background Well

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/12/2022 7:33:54 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS .....

Review your project results through

Have a Question?



Visit us at:

www.eurofinsus.com/Env

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

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

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	13
QC Sample Results	14
QC Association Summary	16
Lab Chronicle	17
Certification Summary	19
Chain of Custody	20
Receipt Checklists	25

4

5

7

8

10

10

13

## **Definitions/Glossary**

Client: TRC Environmental Corporation.

Job ID: 240-166150-1

Project/Site: CCR Background Well

### **Qualifiers**

R	a	d

Qualifier Qualifier Description

\* RPD of the LCS and LCSD exceeds the control limits
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

4

6

9

11

13

### **Case Narrative**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Job ID: 240-166150-1

**Laboratory: Eurofins Canton** 

Narrative

Job Narrative 240-166150-1

### Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226\_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

### Receipt

The samples were received on 5/6/2022 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 0.9° C, 1.3° C and 1.4° C.

### **RAD**

Method 903.0: Radium-226 batch 564568

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-15002 (240-166150-1), MW-15008 (240-166150-2), MW-15016 (240-166150-3), MW-15019 (240-166150-4), DUP-04 (240-166150-5), EB-04 (240-166150-6), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

### Method 904.0: Radium-228 batch 564569

The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

### Method 904.0: Radium-228 batch 564569

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-15002 (240-166150-1), MW-15008 (240-166150-2), MW-15016 (240-166150-3), MW-15019 (240-166150-4), DUP-04 (240-166150-5), EB-04 (240-166150-6), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

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

4

4

5

6

0

9

10

12

13

# **Method Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Method 903.0	Method Description Radium-226 (GFPC)	Protocol EPA	TAL SL
904.0	Radium-228 (GFPC) Combined Radium-226 and Radium-228	EPA	TAL SL
Ra226_Ra228		TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth) Preparation, Precipitate Separation	None	TAL SL
PrecSep_0		None	TAL SL

### **Protocol References:**

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

### Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# **Sample Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166150-1	MW-15002	Water	05/02/22 17:24	05/06/22 08:00
240-166150-2	MW-15008	Water	05/02/22 13:45	05/06/22 08:00
240-166150-3	MW-15016	Water	05/03/22 08:37	05/06/22 08:00
240-166150-4	MW-15019	Water	05/02/22 15:20	05/06/22 08:00
240-166150-5	DUP-04	Water	05/02/22 00:00	05/06/22 08:00
240-166150-6	EB-04	Water	05/02/22 13:45	05/06/22 08:00

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-1

**Matrix: Water** 

Job ID: 240-166150-1

Client Sample ID: MW-15002
Date Collected: 05/02/22 17:24
Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.37		0.522	0.536	1.00	0.574	pCi/L	05/10/22 09:51	06/07/22 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					05/10/22 09:51	06/07/22 18:11	1

Method: 904.0 -	Radium-228	(GFPC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.30	*	0.757	0.816	1.00	0.785	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.7		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
		_	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	4.68		0.920	0.976	5.00	0.785	pCi/L		06/08/22 13:03	1

6/12/2022

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-2

**Matrix: Water** 

Job ID: 240-166150-1

Date Collected: 05/02/22 13:45 Date Received: 05/06/22 08:00

Client Sample ID: MW-15008

Method: 903.0 -	Radium-226	(GFPC)								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.317	U	0.294	0.295	1.00	0.447	pCi/L	05/10/22 09:51	06/07/22 18:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 09:51	06/07/22 18:35	1

Method: 904.0 -	Radium-228	(GFPC)								
		` ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.509	U *	0.388	0.391	1.00	0.588	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.4		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	<b>-228</b>					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.826		0.487	0.490	5.00	0.588	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-3

**Matrix: Water** 

Job ID: 240-166150-1

Cilent	Sample	: ID: MIN	W-15016
Date Co	Moctod:	05/03/22	08-37

Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0815	U	0.195	0.195	1.00	0.368	pCi/L	05/10/22 09:51	06/07/22 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					05/10/22 09:51	06/07/22 18:11	1

Method: 904.0 -	Radium-228	(GFPC)								
		,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.542	U *	0.403	0.406	1.00	0.611	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	84.5		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	bined Ra	dium-226 a	nd Radiun	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	0.624		0.448	0.450	5.00	0.611	pCi/L		06/08/22 13:03	1

6/12/2022

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-4

Matrix: Water

Job ID: 240-166150-1

Client Sample ID: MW-15019
Date Collected: 05/02/22 15:20
Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.278	U	0.349	0.350	1.00	0.579	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 09:51	06/07/22 18:05	1

Method: 904.0 - I	Radium-228	(GFPC)	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.83	*	0.601	0.625	1.00	0.742	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.7		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	ibined Rad	dium-226 a	nd Radium	<b>-228</b>					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.11		0.695	0.716	5.00	0.742	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

**Client Sample ID: DUP-04** 

Lab Sample ID: 240-166150-5

Job ID: 240-166150-1

Date Collected: 05/02/22 00:00 Date Received: 05/06/22 08:00

**Matrix: Water** 

Method: 903.0 -		` ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.650	·	0.422	0.426	1.00	0.599	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					05/10/22 09:51	06/07/22 18:05	1

- Method: 904.0 - I	Radium-228	(GFPC)								
		,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.938	*	0.482	0.490	1.00	0.675	pCi/L	05/10/22 10:04	06/07/22 15:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					05/10/22 10:04	06/07/22 15:34	1
Y Carrier	89.0		40 - 110					05/10/22 10:04	06/07/22 15:34	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.59		0.641	0.649	5.00	0.675	pCi/L		06/08/22 13:03	1

#### **Client Sample Results**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-6

**Matrix: Water** 

Job ID: 240-166150-1

Client Sample ID: EB-04	
Date Collected: 05/02/22 13:4	ı

Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0315	U	0.209	0.209	1.00	0.466	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.6		40 - 110					05/10/22 09:51	06/07/22 18:05	1

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.292	U *	0.488	0.488	1.00	0.832	pCi/L	05/10/22 10:04	06/07/22 15:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.6		40 - 110					05/10/22 10:04	06/07/22 15:35	1
Y Carrier	87.9		40 - 110					05/10/22 10:04	06/07/22 15:35	1

Method: Ra226_Ra2	228 - Con	bined Ra	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.260	U	0.531	0.531	5.00	0.832	pCi/L		06/08/22 13:03	1

#### **Tracer/Carrier Summary**

Client: TRC Environmental Corporation.

Project/Site: CCR Background Well

Job ID: 240-166150-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166150-1	MW-15002	82.3	
240-166150-2	MW-15008	89.8	
240-166150-3	MW-15016	93.0	
240-166150-4	MW-15019	89.8	
240-166150-5	DUP-04	88.3	
240-166150-6	EB-04	57.6	
LCS 160-564568/1-A	Lab Control Sample	94.3	
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3	
MB 160-564568/23-A	Method Blank	99.3	
Tracer/Carrier Legend	i		
Ba = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ва	Υ	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-166150-1	MW-15002	82.3	86.7	
240-166150-2	MW-15008	89.8	86.4	
240-166150-3	MW-15016	93.0	84.5	
240-166150-4	MW-15019	89.8	86.7	
240-166150-5	DUP-04	88.3	89.0	
240-166150-6	EB-04	57.6	87.9	
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9	
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5	
MB 160-564569/23-A	Method Blank	99.3	91.2	

Ba = Ba Carrier

Y = Y Carrier

**Eurofins Canton** 

Client: TRC Environmental Corporation. Job ID: 240-166150-1

Project/Site: CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A

**Matrix: Water** 

**Analysis Batch: 569008** 

Client Sample ID: Method Blank

Prep Type: Total/NA Prep Batch: 564568

MB MB Uncert. Uncert. **MDC** Unit Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL Prepared Analyzed Dil Fac Radium-226 0.002143 Ū 0.135 0.135 1.00 0.285 pCi/L 05/10/22 09:51 06/07/22 20:02

Total

Count

MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 99.3 40 - 110 05/10/22 09:51 06/07/22 20:02

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 564568

**Analysis Batch: 568823** Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Radium-226 11.3 9.625 1.28 1.00 0.274 pCi/L 85 75 - 125

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 94.3 40 - 110

Lab Sample ID: LCS 160-564568/1-A

Lab Sample ID: LCSD 160-564568/2-A

**Matrix: Water** 

**Matrix: Water** 

**Analysis Batch: 568823** 

**Client Sample ID: Lab Control Sample Dup** 

Prep Type: Total/NA

Prep Batch: 564568

Total LCSD LCSD %Rec **RER** Spike Uncert. Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Analyte RER Limit Radium-226 11.3 1.34 1.00 0.405 pCi/L 86 75 - 125 0.03 9.709

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 82.3 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A

**Matrix: Water** 

Analysis Batch: 568850

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

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed pCi/L Radium-228 0.03881 Ū 0.215 0.215 1.00 05/10/22 10:04 06/07/22 15:38 0.396

Total

Count

MB MB

Carrier %Yield Qualifier Limits Prepared Dil Fac Analyzed Ba Carrier 99.3 40 - 110 05/10/22 10:04 06/07/22 15:38 40 - 110 Y Carrier 91.2 05/10/22 10:04 06/07/22 15:38

**Eurofins Canton** 

#### **QC Sample Results**

Client: TRC Environmental Corporation. Job ID: 240-166150-1

Project/Site: CCR Background Well

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A **Client Sample ID: Lab Control Sample** 

**Matrix: Water** 

Analysis Batch: 569007

Prep Type: Total/NA

**Prep Batch: 564569** 

Total LCS LCS %Rec Spike Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL**MDC** Unit %Rec Limits Radium-228 8.55 6.624 1.00 1.00 0.571 pCi/L 75 - 125

LCS LCS

%Yield Qualifier Carrier Limits Ba Carrier 94.3 40 - 110 Y Carrier 84.9 40 - 110

Lab Sample ID: LCSD 160-564569/2-A **Client Sample ID: Lab Control Sample Dup** 

**Matrix: Water** 

**Analysis Batch: 569007** 

Prep Type: Total/NA

**Prep Batch: 564569** 

Total **Spike** LCSD LCSD Uncert. %Rec %Rec Limits Analyte Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit RER Limit Radium-228 9.176 1.00 0.579 pCi/L 8.55 1.28 107 75 - 125 1.12

LCSD LCSD

Carrier %Yield Qualifier Limits Ba Carrier 40 - 110 82.3 40 - 110 Y Carrier 84.5

**Eurofins Canton** 

#### **QC Association Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well Job ID: 240-166150-1

#### Rad

#### **Prep Batch: 564568**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166150-1	MW-15002	Total/NA	Water	PrecSep STD	
240-166150-2	MW-15008	Total/NA	Water	PrecSep STD	
240-166150-3	MW-15016	Total/NA	Water	PrecSep STD	
240-166150-4	MW-15019	Total/NA	Water	PrecSep STD	
240-166150-5	DUP-04	Total/NA	Water	PrecSep STD	
240-166150-6	EB-04	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

#### Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166150-1	MW-15002	Total/NA	Water	PrecSep_0	
240-166150-2	MW-15008	Total/NA	Water	PrecSep_0	
240-166150-3	MW-15016	Total/NA	Water	PrecSep_0	
240-166150-4	MW-15019	Total/NA	Water	PrecSep_0	
240-166150-5	DUP-04	Total/NA	Water	PrecSep_0	
240-166150-6	EB-04	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

#### **Lab Chronicle**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Client Sample ID: MW-15002

Lab Sample ID: 240-166150-1

**Matrix: Water** 

Job ID: 240-166150-1

Date Collected: 05/02/22 17:24 Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:11	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: MW-15008 Lab Sample ID: 240-166150-2

Date Collected: 05/02/22 13:45 **Matrix: Water** Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:35	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-3 **Client Sample ID: MW-15016** 

Date Collected: 05/03/22 08:37 **Matrix: Water** Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:11	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-4 Client Sample ID: MW-15019

Date Collected: 05/02/22 15:20 Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

**Eurofins Canton** 

**Matrix: Water** 

#### **Lab Chronicle**

Client: TRC Environmental Corporation.

Project/Site: CCR Background Well

Client Sample ID: DUP-04 Lab Sample ID: 240-166150-5

Date Collected: 05/02/22 00:00 Matrix: Water Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:34	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: EB-04 Lab Sample ID: 240-166150-6

1

1

568835 06/07/22 15:35 FLC

569042 06/08/22 13:03 SCB

TAL SL TAL SL

Date Collected: 05/02/22 13:45

Date Received: 05/06/22 08:00

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL

Laboratory References:

Total/NA

Total/NA

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

904.0

Ra226\_Ra228

Analysis

Analysis

Job ID: 240-166150-1

3

Δ

5

7

9

11

13

14

#### **Accreditation/Certification Summary**

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

#### **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	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

	<b>Eurofins Canton</b> 180 S. Van Buren Avenue Barberton, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772	Chai	n of Cu	ain of Custody Record	ecord	MICH	MICHIGAN 190	🔅 eurofins	Fins Environment Testing America	ting
	Client Information	Sampler, Helman	4000	Lab PM	Lab PM: Brooks, Kris M	Car	Carrier Tracking No(s):	COC No. 240-94785-33282.1	5-33282.1	Г
	Client Contact Jacob Krenz	Phone: /		-	Brooks@et.er	E-Mail: Kris. Brooks@et eurofinsus.com	State of Origin:	Page 1 of 1	-	
	Company. TRC Environmental Corporation.		PWSID			Analysis Requested	sted	# qop		
	Address. 1540 Eisenhower Place	Due Date Requested:						Preservation Codes	88	
	City Ann Arbor	TAT Requested (days):						B - NaOH		
	State, Zip MI, 48108-7080	llance Project:	A Yes A No			-		D Nitric Acid	id P = Na204S	
	Phone 734-971-7080(Tel) 734-971-9022(Fax)	PO# TBD			(0			G - Amchlor		9
	Email JKrenz@trccompanies.com	WO #				5.				9
	Project Name. Karn/Weadock CCR Background Well	Project # 24024154			be or	1917 1				
	Sire	SSOW#.			PY) @8	Targe		oo te		
					D Filtered S Orm MS/M:	brebnst2 - C		l Number o		
Р	Sample Identification	Sample Date Time	. \	BT-Tissue, A-AL	Perl 903.0	0.106			Special Instructions/Note:	1
ao			+	Preservation Code.				X		
je 2	MW-15002	5/2/22 1724	2	Water	$X \sim 0$	\ \ \			4	
20 o	MW-15008	5/2/22 134	5 6	Water	XXX					
of 25	MW-15016	5/3/12 837	7 6	Water	X					
5	MW-15019	5/2/22 1590		Water	2					
	DUP-04		S	Water	X					
	EB-04	5/2/22 134	12	Water	X					
		+		Water						
						240-1661	240-166150 Chain of Custody			
	Possible Hazard Identification  Non-Hazard — Flammable — Skin Irriant — Poison B	Son B Unknown	Radiological	je	Sample [	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client  Disposal By Lah  Monte	Disposal By Lab	retained longer  ☐ Archive For	than 1 month)	
	ested: I, II, III, IV, Other (specify)				Special In	Requir				
	Empty Kit Relinquished by	Date			Time:		Method of Shipment:			T
	Relinquished by Cur, Jenna Of	Date/Time: 5/3/2	2//600	Company	Received by	ed by Chr	Date/Time	009// 26-	Company	
6/	X	Date/Time /	(330	Company	C Refer	ved by OHM	SIS/33	13/30	Company	
12/2	ME	S15/33 13	335	Company	Received by	Mark Le	Date/Time	0	Company	
2022	Custody Seals Intact: Custody Seal No.:				Gobier .	Adoler Temperature(s) °C and Other Remarks	rks			Г
2										1

•

	166150
Eurofins TestAmerica Canton Sample Receipt Form/Narrative Canton Facility	Login # : 166150
Client Site Name	Cooler unpacked by:
Cooler Received on 56-72 Opened on 5-6-72	One
FedEx: 1st Grd Exp UPS FAS Clippes Client Drop Off TestAmerica Courier	Other
Receipt After-hours: Drop-off Date/Time Storage Location	
TestAmerica Cooler # 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 IR GUN# IR-13 (CF 0.0 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Corrected Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler Temp. °C Cooler To IR GUN#IR-15 (CF -0.7 °C) Observed Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR GUN#IR-15 (CF -0.7 °C Cooler To IR G	emp°C  femp°C  No  No  No  No  No  No  No  No  No  N
12. Are these work share samples and all listed on the COC?  Yes  If yes, Questions 13-17 have been checked at the originating laboratory.	<b>(42)</b>
13. Were all preserved sample(s) at the correct pH upon receipt?  14. Were VOAs on the COC?  Yes	No (NA)
Contacted PM Date by via Verbal Ve	pice Mail Other
Concerning	
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page  Containers for Duf-04 and EB-04 are labeled  Duf-Background and EB-Background. Da  match COC. Samples are logged per the COC	Samples processed by:  I as  ites and times  The 5-6-22
19. SAMPLE CONDITION	
Sample(s) were received after the recommended holding	•
	in a broken container.
Sample(s) were received with bubble >6 mm in	diameter. (Notify PM)
20. SAMPLE PRESERVATION	
Sample(s) were furt  Time preserved: Preservative(s) added/Lot number(s):	her preserved in the laboratory.
rieservauve(s) audem Lot number(s):	
VOA Sample Preservation - Date/Time VOAs Frozen:	

Login #: 166150

	Eurofina Cont	on Comple Descint Ma	Minto Cooley Forms	
Cooler Description		on Sample Receipt Mu		Coolont
Cooler Description (Circle)	n IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
Client Box Off		1,3	1.3	Wet ice Blue ice Dry ice
	19-13 19-15	111		Wet ic Blue ice Dry ice
TA Client Box Off	(R-13) (R-15	1.4	1.4	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	ier )	0.9	0.9	Water None
TA Client Box Oth	HK-13 IR-15			Wet ice Sive ice Dry ice Water None
TA Client Box Off	ier IR-13 IR-15			Wet Ice Bive Ice Dry Ice Water None
TA Client Box Off	er (R-13 /R-15		The second secon	Wet Ice Sive Ice Dry Ice Water None
TA Client Box Oth	er IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Oth	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Oth	IP.13 IP.15			Water None Wet Ice Blue Ice Dry Ice
	IP-13 IP-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	19-13 19-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	er			Water None
TA Client Box Oth				Wet Ice Blue Ice Dry Ice Water None
TA Client Box Oth	er iR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Oth	er IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Oth	er IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Oth	er IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Oth	er IR-13 IR-15		The second secon	Wet Ice Blue Ice Dry Ice
TA Client Box Oth	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	IP-13 IP-15			Water None Wet ice Blue ice Dry ice
	P-13 P-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	(P-13 (P-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Oth	ir-13 ir-15			Water None
TA Client Box Oth	er			Wet ice Blue ice Dry ice Water None
TA Client Box Oth				Wet ice Blue ice Dry ice Water None
TA Client Box Oth	er IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Oth	er IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Oth	IR-13 IR-15		<del></del>	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Oth	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Othe	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IP-13 IP-15			Water None Wet Ice Blue Ice Dry Ice
	IP-13 IP-15			Water None Wet Ice Blue Ice Dry Ice
	IP-13 (P-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Othe	IP.13 IP.15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet ice Slue ice Dry ice
TA Client Box Other	F IK-13 IK-13			Water None
		<del></del>	☐ See Tem	perature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

EB-04

240-166150

Temperature readings: \_ Container Preservative Container Type Client Sample ID Lab ID Temp Added (mls) Lot # <u>pH</u> Plastic 1 liter - Nitric Acid MW-15002 240-166150-A-1 <2 Plastic 1 liter - Nitric Acid MW-15002 240-166150-B-1 <2 MW-15008 240-166150-A-2 Plastic 1 liter - Nitric Acid <2 MW-15008 240-166150-B-2 Plastic 1 liter - Nitric Acid <2 MW-15016 240-166150-A-3 Plastic 1 liter - Nitric Acid <2 MW-15016 240-166150-B-3 Plastic 1 liter - Nitric Acid <2 Plastic 1 liter - Nitric Acid MW-15019 240-166150-A-4 <2 MW-15019 240-166150-B-4 Plastic 1 liter - Nitric Acid <2 DUP-04 240-166150-A-5 Plastic 1 liter - Nitric Acid <2 DUP-04 240-166150-B-5 Plastic 1 liter - Nitric Acid <2 EB-04 240-166150-A-6 Plastic 1 liter - Nitric Acid <2

Plastic 1 liter - Nitric Acid

<2

240-166150-B-6

13

**Environment Testing** 🔅 eurofins

# Chain of Custody Record

Phone: 330-497-9396 Fax: 330-497-0772

180 S. Van Buren Avenue

Barberton, OH 44203

**Eurofins Canton** 

TVA protocol - Ra-226+228 action limit at 5.0 pc/i/. TVA protocol - Ra-226+228 action limit at 5.0 pc/i/L. TVA protocol - Ra-226+228 action limit at 5.0 pCi/L. TVA protocol - Ra-226+228 action limit at 5.0 pCi/L. TVA protocol - Ra-226+228 action limit at 5.0 pc/i/L. T - TSP Dodecahydrate TVA protocol - Ra-226+228 action limit at tote: Since laboratory accreditations are subject to change. Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratory or other instructions will be provided. Any changes to abadratory does not currently maintain accreditation in the State of Origin listed above for analysis/leats/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to Eurofins Environment Testing North Central, LLC. Special Instructions/Note: Company COMPSR Z - other (specify) Ver: 06/08/2021 N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 U - Acetone V - MCAA Months W - pH 4-5 Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mon Preservation Codes: A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
F - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid 240-166150-1 240-151693. 1 - Ice J - DI Water Page 1 of 1 K - EDTA L - EDA 2 8 7 2 2 Total Number of containers 2 0 MAY Y Date/Time Method of Shipment Carrier Tracking No(s) State of Origin: Michigan **Analysis Requested** white Worthington Cooler Temperature(s) °C and Other Remarks: Special Instructions/QC Requirements: FED EX Accreditations Required (See note) Kris.Brooks@et.eurofinsus.com Return To Client × × × × Kazzekazza\_GFPC × × Received by: Received by: × × × × × × Lab PM: Brooks, Kris M × × × × × × ON 10 SOY) GEMISM mohe Time: Fleld Filtered Sample (Yes or No) E-Mail: E COMPANY OF THE PARTY OF THE P Preservation Code: Matrix Water Water Water Water Water Water Company 1428 (C=comb, G=grab) Sample Type Primary Deliverable Rank: 2 Eastern 15:20 Eastern 13:45 Eastern 08:37 Eastern Sample Eastern Eastern 13:45 Time Date: (AT Requested (days): Due Date Requested: 6/7/2022 5-6-22 Sample Date 5/2/22 5/2/22 5/2/22 5/3/22 5/2/22 5/2/22 Project #: 24024154 Date/Time: #0/ ED EX Client Information (Sub Contract Lab) Deliverable Requested: I, II, III, IV, Other (specify) Custody Seal No.: Sample Identification - Client ID (Lab ID) 314-298-8566(Tel) 314-298-8757(Fax) Possible Hazard Identification FestAmerica Laboratories, Inc. MW-15008 (240-166150-2) MW-15002 (240-166150-1) MVV-15016 (240-166150-3) MW-15019 (240-166150-4) Empty Kit Relinquished by: Custody Seals Intact: △ Yes △ No 13715 Rider Trail North DUP-04 (240-166150-5) CCR Background Well EB-04 (240-166150-6) Shipping/Receiving inquished by: d paysing by State, Zip: MO, 63045 Inconfirmed Earth City

#### **Login Sample Receipt Checklist**

Client: TRC Environmental Corporation.

Job Number: 240-166150-1

SDG Number:

Login Number: 166150
List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/09/22 02:40 PM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	

3

4

<del>ا</del>

10

10

13

14



# **Appendix F Field Records**



PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance
PROJECT NUMBER:	464096.0000.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	5/9/27 TO 5/10/27
PURPOSE OF FIELDWORK:	First Quarter 2022 HMP Sampling and Supplemental CCR sampling
WORK PERFORMED BY:	Javier Jasso

REVISED 04/2019



**REVISED 04/2019** 

#### **GENERAL NOTES**

PROJECT NAME:	CEC Weadock LF: 2022 GW Coi	n DATE: 5	13123	HIME AKKINED:
PROJECT NUMBER:	464096.0000.0000	AUTHOR:	Javier Jasso	TIME LEFT: UCA
		WEATHER	· · · · · · · · · · · · · · · · · · ·	, .
EMPERATURE: 以	<u>°</u> F WIND: <u>ι</u> Ċ	MPH	VISIBILITY:	curcu
		AMPLING PI	ERFORMED	
walsh	euf			
				11 A A A A A A A A A A A A A A A A A A
			·	
				· · · · · · · · · · · · · · · · · · ·
PROB	LEMS ENCOUNTERED		CORRECTIVE	ACTION TAKEN
			· · · · · · · · · · · · · · · · · · ·	
<u> </u>				
		OMMUNICAT		
NAME	REPRESENTING	* *	SUBJECT / COMME	VIS
<del></del>	INVESTIGATION	DERIVED V	WASTE SUMMARY	
WASTE MATRIX	QUANTITY		COMMENTS	
			- White Property	
			- 00-000	
	1			
	E/11/32		The h	S-18-22
SIGNED	DAT	<del>_</del> E	CHECKED BY	DAT
0			( /	



#### **GENERAL NOTES**

PROJECT NAME:	CEC Weadock LF: 2022	GW Com DATE:	5(9(2)	TIME ARRIVED: NOCC			
PROJECT NUMBER:	464096.0000.0	000 AUTHOF	R: Javier Jasso	TIME LEFT: 1436			
		***					
	<u></u>	WEATHEI	3				
TEMPERATURE:	°F WIND:	() MPH	VISIBILITY	Die cont			
	WO	RK / SAMPLING P	ERFORMED				
wells SA	mples sur-	Mu 180	ol, ms, msis	50,04p #01			
51,52, 53,0	) W- 53, 58 N	8004, Dug	1 42,53R,50	150,040 401 12,0654			
				1111			
		acc					
			~~~				
PROB	PROBLEMS ENCOUNTERED CORRECTIVE ACTION TAKEN						
			CONNECTIVE	ACTION TAKEN			
				, ,,			
-							
	<del>77 </del>	COMMUNICA	ΓΙΟΝ				
NAME	REPRESENTING	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	SUBJECT / COMMEN	NTS			
MACTEMATEN	· · · · · · · · · · · · · · · · · · ·	ATION DERIVED \	WASTE SUMMARY				
WASTE MATRIX	QUANTITY		COMMENTS				
	·						
	-11	***	1 2				
( )	5/11/27		Je 1	5-18-22			
SIGNED		DATE	CHECKED BY	DATE			
			1/				

REVISED 04/2019



#### **GENERAL NOTES**

PROJECT NAME:	CEC Weadock LF: 2022 GW	Com DATE: 2	5/10/27	TIME ARRIVED: ひららて
PROJECT NUMBER:	464096.0000.0000	AUTHOF	: Javier Jasso	TIME LEFT: \\ 55
		WEATHE	₹	
EMPERATURE: LeC	√°F WIND: 20	ノ MPH	VISIBI	LITY: OUR COUNT
	WORK	/ SAMPLING F	PERFORMED	
Jan-Mu-18	3004, Ow-180	204, 55	,04 55,18	005,0W.57R0
F.BOLEB	01			
				,
PROB	LEMS ENCOUNTERED		CORRECT	TIVE ACTION TAKEN
				<del></del>
	T	COMMUNICA		
NAME	REPRESENTING		SUBJECT / COI	MMENTS
		***************************************		
7- 4 VI VI VI				
			*	
WASTE MATRIX	QUANTITY	ION DERIVED	WASTE SUMMARY COMMEN	WTS
WAGIE WATER	QO/MITT		OCIVILI	110
				· · · · · ·
		AAAPATTEIL		
				A
	/ /		1 0	7.
<u></u>	5/1//2)		Hal "	Sen 5-18-1
SIGNED	5 . 41 /	DATE	CHECKED BY	DA

**REVISED 04/2019** 



#### **EQUIPMENT SUMMARY**

PROJECT NAME:	CEC Weadock LF: 2022 GW Cd	SAMPLER NAME: Lovier Lacco						
PROJECT NO.:	464096.0000.0000	SAMPLER NAME: Javier Jasso						
VALATED LEVEL BYEARI								
WATER LEVEL MEASU	REMENTS COLLECTED WITH:							
HEF	ON DIPPER-T	TRC A2						
NAME AND MODEL OF IN	STRUMENT	SERIAL NUMBER (IF APPLICABLE)						
PRODUCT LEVEL MEA	SUREMENTS COLLECTED WITH	:						
	NA	NA						
NAME AND MODEL OF IN	STRUMENT	SERIAL NUMBER (IF APPLICABLE)						
<b>DEPTH TO BOTTOM O</b>	F WELL MEASUREMENTS COLLE	ECTED WITH:						
HEF	RON DIPPER-T	TRC A2						
NAME AND MODEL OF IN	STRUMENT	SERIAL NUMBER (IF APPLICABLE)						
PURGING METHOD								
PERI	STALTIC PUMP	TRC A2						
NAME AND MODEL OF P	JMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)						
SAMPLING METHOD								
PERI	STALTIC PUMP	TRC A2						
NAME AND MODEL OF P	JMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)						
GEOTECH	DISPOSABLE FILTER	0.45 MICRON						
NAME AND MODEL OF FI	LTERATION DEVICE	FILTER TYPE AND SIZE						
DEDICA	TED POLY TUBING	✓ LOW-FLOW SAMPLING EVENT						
TUBING TYPE		<del>-</del>						
PURGE WATER DISPO	SAL METHOD							
☑ GROUND	☐ DRUM ☐ POTW	☐ POLYTANK ☐ OTHER						
DECONTAMINATION A	ND FIELD BLANK WATER SOUR	CE						
ST	ORE BOUGHT	LABORATORY PROVIDED						
POTABLE WATER SOUR	CE	DI WATER SOURCE						
	-/4/11	10 W 01221						
SIGNED	1111) }	S-18-22						
SIGNED	DATE	CHECKED BY DATE						
REVISED 04/2019		V						



	WATER Q	UALITY	/ MET	ER CALI	3RA	TION LOG				
PROJECT NAME:	CEC Weadock LF: 2022 GV	W Complian	ce	MODEL: YSI I	Pro DSS	3	SAMPLE	ER:	JJ	
PROJECT NO.:	464096.0000.0000			SERIAL#:	TRC A	\2	DATE:	5 (4	12/	
PH	CALIBRATION CHECK				SPE	CIFIC CONDU	CTIVITY	CALIBF	RATION C	HECK
(LOT #): 2(-A ) 16 (EXP. DATE): 1/24 POST-CAL READING/STANDARD	pH 4 / 10 (LOT #): Lo PCO 3 (EXP. DATE): 2 J U POST-CAL. READING / STANDARD	CAL. RANGE	TIME	(EXP.	CAL. #): <b>26</b> ( DATE):	READING	TEMPE	RATURE	CAL. RANGE	TIME
70,0 17a	1- 100 GOD IN MANGE CONTIN				, 11913	N	W	WITHIN RANGE	661	
/	1	☐ WITHIN RANGE				1			☐ WITHIN RANGE	
1	1	☐ WITHIN RANGE				1			☐ WITHIN RANGE	
1	/	WITHIN RANGE	-			1			☐ WITHIN RANGE	
	CALIBRATION CHECK			·		D.O. CAL	BRATIC	ON CHEC	K	· <u>.</u>
CAL. READING (LOT #): 26 (0057) (EXP. DATE): 7/34 POST-CAL. READING / STANDARD	TEMPERATURE (*CELSIUS)	CAL. RANGE	TIME	POST		READING  DING (SATURATED AIR		RATURE	CAL. RANGE	TIME
233 / 323	18.0	WITHIN	0612	<u> </u>		19.21	18	). ).	WITHIN RANGE	061
1		☐ WITHIN RANGE	<u> </u>	,		/	, -	7	WITHIN	<u> </u>
. /		MITHIN				1		~~~~	RANGE WITHIN	
/	RANGE				,			RANGE WITHIN		
TURBID	ITY CALIBRATION CHEC	RANGE		J <u>L</u>		<u>,                                      </u>	COMM	ENTS	RANGE	L
CALIBRATION	READING (NTU)				AUTOCA	L SOLUTION			SOLUTION	(S)
(LOT #) LA MOTHE (EXP. DATE):	(LOT #): (EXP. DATE):	CAL. RANGE	TIME	(LOT ; (EXP.	#): DATE):		LIST LOT NUMBERS AND EXPIRATION DATE UNDER CALIBRATION CHECK			
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD	<u> </u>		CA	LIBRATE	D PARAMETERS	CALIBRATION RANGES (1)		1)	
0 10	/	WITHIN	der		pΗ	1	рН:	+/- 0.2 S.U	J.	
0 10	1	WITHIN	0611		C	OND	COND:	+/- 1% OF	CAL. STAN	idard
1	/	☐ WITHIN RANGE			OI	RP	ORP:	+/- 25 mV		
1	. /	☐ WITHIN RANGE			D.	0.	D.O.:	VARIES		
	NOTES			·   -	TU	JRB	TURB:	+/- 5% OF	CAL. STAN	NDARD
				<sup>(1)</sup> CALIBI THE MOD	RATION RAN	IGES ARE SF VATER QUAL	PECIFIC TO LITY METER			
P	ROBLEMS ENCOUNTERED					CORRECTI	VE ACTION	ıs		
Do Not	working	-								
SIGNED	5/11/25	DATE			CHECK	Le BY	J	7	5-	<b>18-2</b> ∫



#### **WATER LEVEL DATA**

PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance	DATE: 5()())	5/9/23
PROJECT NUMBER:	464096.0000.0000	AUTHOR: Javier Ja	SSO

PROJECT NUMBER.	404096.00			AUTHC	AUTHOR: Javier Jasso			
WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION		
JCW-MW-18001	otest	тос	16-76	23.75	NA	NM		
JCW-MW-18004	ora	TOC	1226	14.72	NA	NM .		
JCW-MW-18005	6721	TOC	8.33	(478)	NA	NM		
JCW-MW-18006	orus	TOC	1291	23.60	NA	NM		
JCW-OW-18001	cles	TOC	17.00	2005	NA	NM		
JCW-OW-18002	ccesy	TOC	1094	19.41	NA	NM		
JCW-OW-18003	delle	TOC	8.51	16662	NA	NM		
JCW-OW-18004	0707	TOC	427	14.85	NA	NM		
JCW-OW-18006	0743	TOC	<b>19</b> .20	1347	NA	NM		
LH-103 🌊	1015	TOC	23.50	33,41	NA	NM		
LH-104	5717	TOC	7.440	1400	NA	NM		
MW-20	724	тос	6.53	14.00	· NA	NM		
<b>MW</b> -50	Clezz	тос	13.49	1818	NA	NM		
MW-51	6629	TOC	14.33	20.00	NA	NM		
MW-52	Gaus	тос	14.13	19.74	NA	NM		
MW-53	ae TI	TOC	13.73	18-18	NA	NM		
MW-53R	ouse	TOC	14.23	16.80	NA	NM		
MW-54R	0701	TOC	1380	17.00	NA	NM		
MW-55	0717	TOC	14.00	1626	NA	NM		
MW-58	0874	TOC	5.30	1676	NA	NM		
OW-51	0640	TOC	(0.0%	17.080	NA	NM		
OW-53	cess	TOC	7.56	1800	NA	NM		
OW-54	0707	TOC	681	16.46	NA	NM		
OW-55	<i>जाफ</i>	TOC	6.16	18 Uz	NA	NM		
OW-56R	6737	TOC	5.95	Dum	NA	NM		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

S (MI)

CHECKED

-18-22

DATE



#### **WATER LEVEL DATA**

PROJECT NAME:	CEC Weadock LF: 2022 GW Compliance	DATE: 5 (2/33
PROJECT NUMBER:	464096.0000.0000	AUTHOR: Javier Jasso

TIOULOT NOMBLIA.				AOTHC	JR. Javiel Jassu	·
WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-57 IN	0770	TOC	4.56	19.60	NA	NM
OW-57R IN	0721	тос	(o.H)	10.10	NA	NM
OW-57 OUT	0137	тос	10.10	19.48	NA	NM
OW-57R OUT	6777	TOC	10.10	2000	NA	NM
OW-61	orce	тос	966	Drn	NA	NM
OW-63	0800	TOC	could n	of lock	Le NA	NM
Jan-15 020g	CENTED !		18 Time	1200	-	
Jun-15020	cle 55		14.98	Bom		
mw-16 R	0703		14.10	Dum		
Jan milso 2(	076		15:30	90r		
ou-56	3650		598	Own		
MW-19	0000		86i	DUM		
Mu- 15030	مالاس		Sa	Dhr		
mu-lles	0870		4.61	D.Um		
MW-15024	0833		580	Owm		
<del> </del>						
						ļ
		Ì		1		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR  $f \qquad (\text{E.G., 1.1 + 0.00 T/PVC}).$ 

REVISED 04/2019

IGNED

# ♦ TRC

PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED											
PROJECT	NUMBER	R: 46409	6.0000.0000	ВҮ	:	JJ	DATE:	122	BY:	ZK	DATE:5-18-22
SAMPLE	ID: J UU	U-Mu.	18001	WELL DIA	METI	ER: 🗸	2"	6" 🗌	OTHE	ΞR	
WELL MAT	ERIAL:	☑ PVC	ss 🗆	IRON GA	LVAI	NIZED S	TEEL		ОТНЕ	ER	
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗌 DI			LEACHATE		ОТН	ER	
PUR	SING	TIME:	230 DA	TE5 (41)	)	S	AMPLE	TIME:	070	v 🔨	DATES (%())
PURGE METHOD	· _	PUMP BAILER	PERISTALTIC F	PUMP		PH: ORP: <sup>4</sup>	<u>6.97</u> s	U CC		TIVITY: <u>0</u>	mg/L umhos/cm
DEPTH TO	WATER:	16.76c	T/ PVC			TURBI	DITY: _ <b>5</b> .υ		 U	······································	
DEPTH TO	BOTTOM:	2375	T/ PVC			₽ NOI	NE SLI	GHT		MODERATE	E 🗌 VERY
WELL VOLUME: NA LITERS GALLONS TEMPERATURE: LLC °C OTHER:											
	REMOVED:	~~	LITERS	 ☐ GALLONS		COLOR		W	-	ODOR:	MONE
COLOR:		<u></u>	<del>,                                    </del>	OR <b>NO!</b>			TE (0.45 um)			NO NO	
		TUR	BIDITY	- 1	$\overline{}$	FILTRA	TE COLOR:	******	T	FILTRATE (	DDOR:
□ NONE □ SLIGHT   MODERATE □ VERY □ QC SAMPLE: □ MS/MSD □ DUP											
DISPOSAL METHOD: S GROUND □ DRUM □ OTHER COMMENTS: Not working											
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP		D.O.	TURBIDITY	TEMP	ERATUR	RE WATE	
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	(1	mg/L)	(NTU)		(°C)	(FEE	1 ' I
Sezo	λυρ	400	3043	103.4	-\	m	43.0	11.	Ü	طعاا	C INITIAL
Ge31		6.79	305	4.5		١	19.3	U.	>	16 le"	1
rede		6.80	3071	0.3			33.C	li.	3	164	י א
Chad i		ري سي تر	3476	-6:7			5.60	и,	1	166	3
06 50		6095	2798	-1-9			5,45	11	C	164	
6671	ļ	695	2600	-15. 5			5.1 T	10	.9	166	7 (
074		4.95	كالوحان	-15-7			<b>5</b> 00	( )	رڻ	(6)	67 L
0705	_	694	2000	- 160		<i>V</i>	5.00	11.	·C	161	<i>σ</i>
NO	TE: STABI	LIZATION 1	TEST IS COMPL	ETE WHEN 3	SUC	CESSIV	E READINGS A	RE WIT	THIN T	HE FOLLOW	VING LIMITS:
pH: +/-	0.1	COND.: +/-	3 % ORP:	+/- 10 [	0.0.:	+/- 0.3	TURB: +/-	10 %	or	= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-
BOTTLES	FILLED	PRESERV	ATIVE CODES	A - NONE	В-	ниоз	C - H2SO4	D-	NaOH	E-	HCL F
NUMBER	SIZE	TYPE	PRESERVATIV	1 1 1 1 1	ĒD	NUMB	ER SIZE	TYF	PE	PRESERV	ATIVE FILTERED
<u> </u>	191	9/11/5	B		N						
3	761	PL	A		N					· · · · · · · · · · · · · · · · · · ·	П У Пи
	250	PI	A		N						
نې	3 13 1 P										
2	14	PI	B		N						U Y U N
SHIPPING	METHOD:	lab l	ron off DA	TE SHIPPED:	ζ	111	())	AIF	RBILL N	IUMBER:	
COC NUMBER: DATE SIGNED:											
L					-/-			!_		<del></del>	1 41 J

# ◆ TRC

PROJECT NUMBER	PROJECT	ΓNAME:	CEC V	Veadock LF: 20	022 GW C		PRE	PARED			CHEC	KED
WELL MATERIAL:   PVC   SS	PROJECT	NUMBER	R: 46409	6.0000.0000	BY:		JJ	DATE	(() \ B	(: <u>I</u>	12	DATE: 5-18-22
SAMPLE TYPE:   GW   WW   SW   DI	SAMPLE	ID: MC	U 50	9	WELL DIA	ИЕТЕ	R: 🗸	2"	6" [] (	THER		
PURGING	WELL MAT	ERIAL:	☑ PVC	ss 🗆	IRON GAI	_VAN	IIZED S	ΓEEL		THER		
PURGE	SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗌 DI		ا 🗆 د	EACHATE		THER		
METHOD	PUR	GING	TIME:07	UU DA	TES (9/3)				TIME:つ	၁၀ <sup>(</sup>		TE:5/9/37
DEPTH TO WATER   3, UK   17 PVC		· _		PERISTALTIC F	PUMP	ļ.,					111.	<u> umhos/cm</u>
DEPTH TO BOTTOM   Q.   U   T   PVC						_				/	VM mg	/L
WELL VOLUME:   NA									-	¬		<del></del>
VOLUME REMOVED: \$						<del></del>	· <del>·</del>					U VERY
COLOR:			-		=			- 71.		_		
TURBIDITY												1010
NONE   SLIGHT   MODERATE   VERY   QC SAMPLE   MS/MSD   FE DUP. FO	COLOR:		-		DRI WY	_			∐ YES		····	
DISPOSAL METHOD   GROUND   DRUM   OTHER   COMMENTS:   O not work in y		∏ s⊔			☐ VERY				/MSD			
TIME PURGE RATE RATE RATE RATE RATE RATE RATE RAT	<u> </u>											<del>.</del>
MIMINI   SU   Cumhos/cm   CmV   Cmg/L   CNTU   CC   FEET   CGAL OR UND   CMJ   TIME PURGE PH CONDUCTIVITY ORP DO TURRIDITY TEMPERATURE WATER CUMULATIVE												
1												
159   58.4   6.60   6.6   133   1   1   1   1   1   1   1   1	47UD	` ^	·			<del>- `-</del>						<u> </u>
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.: +/-   BOTTILES FILLED   PRESERVATIVE CODES   A - NONE   B - HNO3   C - H2SO4   D - NBOH   E - HCL   F - L-     NUMBER   SIZE   TYPE   PRESERVATIVE   FILTERED   NUMBER   SIZE   TYPE   PRESERVATIVE   FILTERED     3</td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td>												1
1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490   1490	<b>-</b>						1		9.0			<u>;</u>
1					<del></del>		1		Ġ,		T .	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</td <td></td> <td></td> <td></td> <td>1491</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Ý</td>				1491								Ý
NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:  pH: +/- 0.1				1463		١,	1/		~~~~~~~~		<u> </u>	<del></del>
NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:  pH: +/- 0.1		>			· · · · · · · · · · · · · · · · · · ·		4		<del></del>	•	1331	10
NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:  pH: +/- 0.1	owir	4							***************************************	************************	1331	-7
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												
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										***************************************		
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	NC	TE: STABI	LIZATION 1	TEST IS COMPL	ETE WHEN 3 S	UCC	ESSIVE	READINGS A	RE WITH	N THE	FOLLOWIN	G LIMITS:
NUMBER SIZE TYPE PRESERVATIVE FILTERED NUMBER SIZE TYPE PRESERVATIVE FILTERED  3 13 T C(A41 A												
3 13 T C(A4i A	BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	B - I	НИО3	C - H2SO4	D-N	аОН	E - HC	L F
2   250   2   A     Y   D   N	·			PRESERVATIV	/E FILTERE	D	NUMBE	R SIZE	TYPE	PF	RESERVATI	VE FILTERED
3       13 ↑       ↑       ↑       ↑       ↑       ↑       □       ∨       □       N         3       13 ↑       ↑       ↑       ↑       ↑       □       ∨       □       N         10       ↑       ↑       ↑       ↑       □       ∨       □       N         10       ↑       ↑       ↑       ↑       □       ∨       □       N         10       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑       ↑		13 5	GA41	1		-	······					□ Y □ N
3 13 T 13 1 P3	<u> </u>							□ Y □ N				
SHIPPING METHOD: Lab Dray of Q DATE SHIPPED: \( \sum_{\mathcal{I}} \sum_{\mathcal{I}} \sum_{\mathcal{I}} \)  AIRBILL NUMBER:	2	761		A		N						□ Y □ N
SHIPPING METHOD: Lab Dray of Date SHIPPED: SIPPED: SIPPED: AIRBILL NUMBER:	Э	761	16	B	□ Y <b>□</b>	N						□Y □N
	1-1	11	19	ರಿ		N		1				□ Y □ N
	SHIPPING	SHIPPING METHOD: 16h Dray of Pate SHIPPED: (11) AIRBILL NUMBER:										
	COC NUMI	BER:			SNATURE:				DATE	SIGNE	D: 5 /	1//2

\$ - ...

ジェスし	<b>&lt;&gt;</b>	TRC
------	-----------------	-----

PROJECT NUMBER: 464096.000.0000   BY: JJ   DATE   JJ   DATE   JR	PROJECT	NAME:	CEC V	Veadock LF: 2	022 GW C		PRE	PARED			CHEC	CKED
WELL MATERIAL	PROJECT	NUMBER	R: 46409	6.0000.0000	В	<b>Y</b> :	IJ	DATE	นา 🖪	A:	K	DATE: 5-18-27
SAMPLE TYPE	SAMPLE	ID: MU	りらし		WELL DI	AMET	ER: 🗸	2"	6" 🗌	OTHER		
PURGING TIME 0.5 \$ DATE: \$ 91.0 SAMPLE TIME: CALT DATE: \$ 92.0 umbos/cm PMETHOD: BAILER	WELL MAT	ERIAL:	☑ PVC	ss 🗆	IRON G	ALVA	NIZED ST	ΓEEL		OTHER		
PURGE	SAMPLE T	YPE:	☑ GW	□w □	SW 🗆 D	)I		EACHATE		OTHER		
METHOD:	PUR	GING	TIME	)5 b	TE: S Gla	32	SA	MPLE		<u> </u>		
DEPTH TO WATER: 14-32 T/ PVC		` _		PERISTALTIC	PUMP							
DEPTH TO BOTTOM:	DEPTH TO	) WATER:	14-32	T/ PVC					NTU			
VOLUME REMOVED.   COLOR:   CVEV   ODOR:   NO NU	DEPTH TO	ВОТТОМ:	20.00	T/ PVC			4 .		GHT	□ моі	DERATE	☐ VERY
NONE	WELL VOL	UME:	NA	LITERS	GALLON	S	TEMPER	RATURE: 💁	<u>゜</u> 。	с отн	HER: _	
NONE   SLIGHT   MODERATE   VERY   VERY   VERY   GC SAMPLE   MS/MSD   DUP-     NONE   SLIGHT   MODERATE   VERY   VERY   GC SAMPLE   MS/MSD   DUP-     DISPOSAL METHOD   GROUND   DRUM   OTHER   COMMENTS:   O. n of   Wo of   K'   N     TIME   PURGE   PH   CONDUCTIVITY   ORP   D.O.   TURBIDITY   TEMPERATURE   LEVEL   PURGE VOLUME   (MN/M)   (MN/M	VOLUME F	REMOVED:	5-6	LITERS	GALLON	s	COLOR	: Che	0 V	ODO	DR: _	none
NONE				OD	OR: NON	)	FILTRAT	E (0.45 um)	YES	7	-NO	
DISPOSAL METHOD     GROUND     OTHER   COMMENTS:			TUR	BIDITY			FILTRAT	E COLOR:				OR:
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL (CMUNICATIVE PURGE VOLUME (MININ) (MININ) (SU) (umhos/cm) (mV) (mg/L) (NTU) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (CC) (FEET) (GALORL) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MININ) (MINI												
Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   D.O.: H/- 0.3   Turb: H/- 10%   Or    Note: Stabilization test is complete when 3 successive readings are within the following limits:   Phi: H/- 0.1   Cond.: H/- 3%   Orp: H/- 10   Org: H/- 0.3   Org: H/- 10   O	DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: W. notworki'n											
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%   OF    NOMBER   SIZE   TYPE   PRESERVATIVE   FILTERED   NUMBER   SIZE   TYPE   PRESERVATIVE   FILTERED	TIME		PH	CONDUCTIVITY	ORP		D.O.	TURBIDITY	TEMPER	RATURE		
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.: +/-   NUMBER   SIZE   TYPE   PRESERVATIVE   FILTERED   NUMBER   SIZE   TYPE   PRESERVATIVE   SIZE   TYPE   NUMBER   SIZE   TYPE   SIZE   TYPE   NUMBER   SIZE   TYPE   SIZE   TYPE   NUMBER   SIZE   TYPE   NUMBER   SIZE   TYPE   SIZE   TYPE   NUMBER   SIZE   TYPE   /td <td></td> <td></td> <td>` ′</td> <td></td> <td></td> <td>(</td> <td>mg/L)</td> <td><del></del></td> <td></td> <td></td> <td>(FEET)</td> <td>(GAL OR L)</td>			` ′			(	mg/L)	<del></del>			(FEET)	(GAL OR L)
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 - NBOH   E - HCL   F - L-     NUMBER   SIZE   TYPE   PRESERVATIVE   FILTERED   NUMBER   SIZE   TYPE   PRESERVATIVE   FILTERED     1 3 7</td <td></td> <td>200</td> <td>75 \</td> <td>ઈંડે 1</td> <td>107.</td> <td></td> <td>NM</td> <td>53</td> <td>11,</td> <td><u> </u></td> <td>14.00</td> <td>INITIAL</td>		200	75 \	ઈંડે 1	107.		NM	53	11,	<u> </u>	14.00	INITIAL
1		\_		14.74	છે. ગ			13.0			1403	
1								3,50				1
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</td <td>0909</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3.15</td> <td></td> <td></td> <td></td> <td></td>	0909							3.15				
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</td <td></td> <td></td> <td><u>`</u></td> <td>•</td> <td></td> <td></td> <td>_\/</td> <td>3.0</td> <td></td> <td></td> <td></td> <td></td>			<u>`</u>	•			_\/	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</td <td>0917</td> <td></td> <td>7.23</td> <td>7076</td> <td>- 29.1</td> <td></td> <td>V</td> <td>2.フィ</td> <td>9.</td> <td>C</td> <td>1408</td> <td></td>	0917		7.23	7076	- 29.1		V	2.フィ	9.	C	1408	
pH: +/- 0.1         COND.: +/- 3%         ORP: +/- 10         D.O.: +/- 0.3         TURB: +/- 10%         or           TEMP.: +/-           BOTTLES FILLED         PRESERVATIVE CODES         A - NONE         B - HNO3         C - H2SO4         D - NaOH         E - HCL         F											1400	-6
pH: +/- 0.1         COND.: +/- 3%         ORP: +/- 10         D.O.: +/- 0.3         TURB: +/- 10%         or           TEMP.: +/-           BOTTLES FILLED         PRESERVATIVE CODES         A - NONE         B - HNO3         C - H2SO4         D - NaOH         E - HCL         F										***************************************		
pH: +/- 0.1         COND.: +/- 3%         ORP: +/- 10         D.O.: +/- 0.3         TURB: +/- 10%         or           TEMP.: +/-           BOTTLES FILLED         PRESERVATIVE CODES         A - NONE         B - HNO3         C - H2SO4         D - NaOH         E - HCL         F												
pH: +/- 0.1         COND.: +/- 3%         ORP: +/- 10         D.O.: +/- 0.3         TURB: +/- 10%         or           TEMP.: +/-           BOTTLES FILLED         PRESERVATIVE CODES         A - NONE         B - HNO3         C - H2SO4         D - NaOH         E - HCL         F												
BOTTLES FILLED PRESERVATIVE CODES A-NONE B-HNO3 C-H2SO4 D-NaOH E-HCL F	NC	TE: STABI	LIZATION 1	TEST IS COMPL	ETE WHEN 3	SUC	CESSIVE	READINGS A	RE WITH	IIN THE F	OLLOWIN	NG LIMITS:
NUMBER SIZE TYPE PRESERVATIVE FILTERED NUMBER SIZE TYPE PRESERVATIVE FILTERED    13   G	pH: +/-	0.1	COND.: +/-	3 % ORP:	+/- 10	D.O.:	+/- 0.3	TURB: +/-	10 %	or =</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-
2 13 i GIAS A	BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	В-	HNO3	C - H2SO4	D - N	laOH	E - H	CL F
250   71   A	NUMBER			<u>-</u>	<del></del>		NUMBE	R SIZE	TYPE	PR	ESERVAT	<del></del>
1 1) 1 7 1 A DY DN DY DN DY DN DY DN SHIPPING METHOD: Cab Drop of DATE SHIPPED: JULY D AIRBILL NUMBER:	<u> </u>		GIASI	<u>/</u>								
SHIPPING METHOD: Lab Drop of DATE SHIPPED: JULY J AIRBILL NUMBER:		250	PI	<i>/</i> †								N P
SHIPPING METHOD: Lab Drop of DATE SHIPPED: 3 (1) AIRBILL NUMBER:	13   7   16   16   16   1   1   1   1   1   1											□ Y □ N
SHIPPING METHOD: (ab Drop of DATE SHIPPED: 5 (1)) AIRBILL NUMBER:								□Y □N				
	9	11	PI	B		B N						
COC NUMBER: DATE SIGNED: 5	SHIPPING	METHOD:	lab Dr	op off DA	TE SHIPPED	: 3	111		AIRB	ILL NUM	BER:	
	COC NUME	BER:		SI	GNATURE:		$\sim$		DATI	E SIGNEI	D: 5	11/1

<b>&lt;&gt;</b>	TR	C

PROJECT	Г NAME:	CEC V	Veadock LF: 2	022 GW C	PR	EPARED		,	CHEC	KED
PROJECT	Г NUMBE	R: 46409	6.0000.0000	BY:	JJ	DATE:	U) BY	JX	_	DATE: <b>5-18-2</b> 2
SAMPLE	ID: M	U 5	5	WELL DIAM	IETER: 🗸	2"	6" 0	THER		
WELL MAT	ERIAL:	☑ PVC	□ ss □	IRON GAL	VANIZED S	STEEL	O	ΓHER		
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗆 DI		LEACHATE	□ o	THER		
PUR	GING	TIME: 🔿 (	950 DA	TE: 5(9/37	· S	AMPLE	TIME: (	200	DA	TE: 5/9/31
PURGE		PUMP	PERISTALTIC F	PUMP		<u>691</u> s			ITY: <u>До (</u>	umhos/cm
METHOD	D:	BAILER			ORP:	<u>-もい</u> m	V DO:		VM mg.	/L
DEPTH TO	WATER:	14.13	T/ PVC		TURBI	DITY: <u> </u>	NTU -			
DEPTH TO	DEPTH TO BOTTOM: 19 T/ PVC									
WELL VOL	UME:	NA	LITERS	GALLONS	TEMPE	RATURE: (C	<b>₊⋦</b> _∘c	ОТН	HER:	
VOLUME I	REMOVED	: (0	LITERS	GALLONS	COLO	R: <u>U</u>	a	ODO	OR: Y	10 N P
COLOR:		:hear	OD	OR: 1014	FILTRA	TE (0.45 um)	YES	<u> 4</u>	. NO	,
		TUR	BIDITY		FILTRA	TE COLOR:		FIL.	TRATE ODC	DR:
☐ NONE	<b>∄</b> -s∟		MODERATE	☐ VERY		MPLE: MS	/MSD		DUP-	
DISPOSAL METHOD K GROUND DRUM OTHER COMMENTS: NO not working										
TIME	PURGE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERA	TURF	WATER	CUMULATIVE
"	RATE (ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)		LEVEL (FEET)	PURGE VOLUME (GAL OR L)
0950	200	7.55	9 C	93.4	NM	16.0	140	<u>,                                    </u>	1468	INITIAL
	390		10 (-7		/V' \				<del>  ` `                                 </del>	
425		699	1967	30.E		3.80	10.		14.80	1
1000		696		(6.5		3,50	16.	<u> </u>	14 EC	2
1001		6.96	1988	<b>〜</b> フィて		311	(6)		14.80	3
1010		695		- 7,8		3.00	(0,0	ون	14.80	<u> </u>
1015		6.95	3000	7.9	1	255	10.	<u> </u>	14.80	5
(0)0		6.95	20 <i>0</i> 0	- 8.0	J	2.75	įΰ	$\overline{\Gamma}$	1480	6
	1									'
					·····					
N/C	TE: STAR	II IZATION :	TEST IS COMPL	ETE WHEN 2 S	ICCESSIV	E DEADINGS A	DE WITHIN	TUE	EOL LOWING	C LIMITS:
pH: +/-		COND.: +/-			O.: +/- <b>0.3</b>			- =</td <td></td> <td>TEMP.: +/-</td>		TEMP.: +/-
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - Na	OH C	E - HC	L F
NUMBER	SIZE	TYPE	PRESERVATI	/E FILTEREI	NUMB	ER SIZE	TYPE	PR	RESERVATI	VE FILTERED
3	(25	alnss	A		N					□ Y □ N
	250	Pl	( <del>1</del>	□ Y <b>፲</b>	N					□ Y □ N
i	125	PI	r <del>)</del>	□ Y <b>□</b>	N					
	125	חו	B		N		<del></del>	1		OY ON
7	11	D(	B					+		Y N
SHIPPING	METHOD:	-	00	TE SHIPPED:	7/	(//))	AIRBIL	L NUM	BER:	
COC NUME	BER:	177		GNATURE:		\ \	DATE :			11/2
L							<u> </u>			<u> </u>

<b>&lt;&gt;</b>	TRC
` <b>/</b>	

PROJECT	NAME:	CEC V	Veadock LF:	2022 GW C		PR	EPARED			CHEC	KED
PROJECT	NUMBER	R: 464096	3.0000.0000		BY:	JJ	DATE: (u	101	BY: 3	۴	DATE 5-18-12
SAMPLE	ID: MU	ひちろ		WELL 0	DIAMET	ER: 🗸	2"	6" 🔲	OTHER		
WELL MAT	ERIAL:	✓ PVC	□ss □	] IRON 🔲	GALVA	NIZED S	STEEL		OTHER		
SAMPLE T	YPE:	☑ GW	□ ww   □	]sw 🗆	DI		LEACHATE		OTHER		
PURC	SING	TIME: \C	799	DATE: 5 9	ንጉ	S	AMPLE	TIME:	100	<b>1</b> DA	TE:9 9132
PURGE		PUMP	PERISTALTIO	PUMP							<del>俗)</del> umhos/cm
METHOD		BAILER	<u>:</u>			ORP:		V DO:		VM mg	/L
DEPTH TO WATER: 13.73 T/ PVC TURBIDITY: 3.71 NTU											
DEPTH TO BOTTOM: 18.16 T/ PVC											
WELL VOL	UME:	NA	LITERS	☐ GALLO	NS	TEMPE	RATURE:	0-1	°C ОТ	HER:	
VOLUME F	REMOVED:	U.	LITERS	☐ GALLO	NS	COLO	2: Clique		OD	OR: (	7016
COLOR:	6,	100	·	DOR: OU	n 4	FILTRA	TE (0.45 um)	☐ YES	s <del>[</del> 4]	-NO	
			BIDITY			i	TE COLOR:			TRATE ODG	DB.
Ø-NONE	SLI		MODERATE	☐ VEF	RY		MPLE: MS	/MSD		DUP-	DIV.
DISPOSAL	METHOD:	<b>⊠</b> GROUN	ND DRUM	/ □ OTHER	<u> </u>	сомм	ENTS: DO	, <u>v</u>	ot u	sorkir	19
TIME	PURGE RATE	PH	CONDUCTIVIT	Y ORP		D.O.	TURBIDITY	TEMP	ERATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME
	(ML/MIN)	(SU)	(umhos/cm)	(mV)		mg/L)	(NTU)		(°C)	(FEET)	(GAL OR L)
1049	200	7.61	1438	936	, ,	VM	5.0	14	ط	1351	INITIAL
1054		743	1394	86. C	<i>'</i>	1	4.75		<u>.</u> 4	13,70	(
16 59		7.30	1387	-48.0	,		4.15	10		1370	3
1104		7.36	1374	_ 48.			3.8√	10	٦.	13.76	3
1109		7.31	1360	_49.	0	1	3.75	(0	· - l	1370	4
										ļ	
	J										
							E READINGS A				
pH: +/-	0.1	COND.: +/-	3% OR	P: +/- <b>10</b>	D.O.:	+/- 0.3	TURB: +/-	10 %	or ≕</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-
BOTTLES	FILLED	PRESERV	ATIVE CODES			HNO3	C - H2SO4	D -	NaOH		CL F
NUMBER	SIZE	TYPE	PRESERVA		ERED	NUMB	ER SIZE	TYF	PE PI	RESERVAT	
2	() 5	9)451	A		IP N						
	<u> გჯა</u>	Di	A		<u>(1)</u> N			ļ			
	17.7	DI	A.		Δh						OY ON
1 125 DI B DY DN											
ゝ	11	PI	<u>B</u>	□ Y	Z <del>I</del> N						□ Y □ N
SHIPPING METHOD: Jab Drop of DATE SHIPPED: ((())) AIRBILL NUMBER:											
COC NUME	BER:			SIGNATURE:			}	DA	TE SIGNE	:D: <u></u>	///
					τ.	7	7				, ,,,,,,

# ♦ TRC

PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED . CHECKED											
PROJECT N	NUMBEF	R: 464096	6.000.0000	BY:		JJ	DATES	127 E	3Y: 5	JK	DATE: 5-18-21
SAMPLE ID	): ()U	J- 5	3	WELL DIAN	1ETER	₹: 🗸 2	2"	6" 🗌	OTHER		
WELL MATE	RIAL:	☑ PVC	ss 🗆	IRON GAL	.VANIZ	ZED ST	EEL		OTHER		
SAMPLE TYP	PE:	☑ GW	□ ww □	SW 🗌 DI		L	EACHATE		OTHER		
PURGI	ING	TIME: \ \	37 D	TE:5 93	3-		MPLE	TIME: \	313	<b>)</b> D/	ATE: 5 [9/28
PURGE	<b>V</b>	PUMP	PERISTALTIC	PUMP		_	7.76 s	U CON	IDUCTIV		11 umhos/cm
METHOD:		BAILER			0	RP:		V DO:	_/\	<u>₩_</u> mg	/L
DEPTH TO V						URBID	ITY: 9-8	_ NTU			
DEPTH TO E	BOTTOM:	(8cc	T/ PVC		J	NON		GHT	□ мо	DERATE	☐ VERY
WELL VOLUM	ME:	NA	LITERS	GALLONS	TE	MPER			с отн	HER:	
VOLUME RE	MOVED:	<u> </u>	LITERS	GALLONS	· c	OLOR:	<u>Che</u>	<u> </u>	ODO	OR: <u>t</u>	101e
COLOR:		1000	USIC OF	OR: NON	_ FI	LTRAT	E (0.45 um)	YES	<b>P</b>	-NO	
	_		BIDITY	£			COLOR:			TRATE ODG	DR:
NONE ☐ SLIGHT ☐ MODERATE ☐ VERY QC SAMPLE: ☐ MS/MSD ☐ DUP											
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: DO not working											
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL PURGE VOLUME											
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg	<sub>J</sub> /L)	(NTU)	(°	C)	(FEET)	(GAL OR L)
1132 3	404	771	631	20.1	N	M:	3777	18.	9	749	INITIAL
(138)		7.31	1365	-63.0			235)	U = (	<u>ک</u>	7.80	10
1143		7.31	1363	-64.5			1771	11-		7.80	<u> </u>
1148		730	1363	-70.0			50	10.	9	7.80	3,0
น 53		7.28	1362	-750			240	M.	ن	7.86	12KU
1156		7.76	1359	-75. (			19.0	tj.	(	786	D.5.U
1263	_	7.76	1364	-75.8			10.0	\	1	780	Ce
1208		7.26	1364	= 6.0			100	16	. (	781	7
1213	_	7.20	1371	-76.1	/		9.85	11	1	7.83	8
NOTI	E: STABII	L <b>IZATION</b> T	EST IS COMPL	ETE WHEN 3 S	UCCE	SSIVE	READINGS A	RE WITH	IIN THE I	FOLLOWIN	G LIMITS:
pH: +/- <b>0.</b>	.1 0	COND.: +/-	3 % ORP:	+/- <b>10</b> D.	O.: +/	- 0.3	TURB: +/-	10 %	or =</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-
BOTTLES F	FILLED	PRESERVA	ATIVE CODES	A - NONE	B - HI	NO3	C - H2SO4	D - N	laOH	E - HO	L F
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTERE	D N	UMBEI	R SIZE	TYPE	PF	RESERVAT	VE FILTERED
21	125	9 lAbi	A		N						□ Y □ N
\ 7	<b>λ</b> 5υ	19	A		N						
N Y D Y D Y D Y D Y D Y D Y D Y D Y D Y											
1 (25 71 B) DY 1 DY DN											
					N						OY ON
SHIPPING ME	ETHOD:	Lab Drov	off DA	ATE SHIPPED:	7	111	/ <sub>21</sub>	AIRE	ILL NUM	IBER:	
COC NUMBE	 R:	- '00		GNATURE:			<del>// )</del>		E SIGNE		5/1/1
		· · · · ·			6	$\rightarrow$				<u> </u>	) ' //   <u>) '</u>

<b>&lt;&gt;</b>	Tr	C
-----------------	----	---

PROJECT	PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED											
PROJEC1	NUMBER	R: 464096	6.0000.0000	BY:		JJ	DATE:	15	BY:	JK	DATE: 5-18-22	
SAMPLE	ID: M	<del>ن ج</del>	50	WELL DIAM	METE	ER: ☑ :	2"	6" 🗌	ОТНЕ	ER		
WELL MAT	ERIAL:	√ PVC	ss 🗆	IRON GA	LVAN	NIZED S	ΓEEL		OTHE	ER		
SAMPLE T	YPE:	☑ GW	□ ww □	SW DI			EACHATE.		OTHE			
PUR	GING	TIME: 12	13) DA	TE: 5/9/3	J	SA	MPLE	TIME:	13	57 [	DATE: 5 9 37	
PURGE METHOI	_	PUMP BAILER	PERISTALTIC F	PUMP		PH: _	6.97 SI			1 <u>ν ω Ι</u> :Υτι <u>γιτ</u> π ΜΜ	umhos/cm	
DEPTH TO	) WATER:	5.36	T/ PVC			TURBID		S NTI				
		16.78	T/ PVC			□ NON	E SLIC	— GHT		MODERATE	☐ VERY	
WELL VOL	WELL VOLUME: NA LITERS GALLONS TEMPERATURE: ( O C OTHER:											
	REMOVED:	_ < .	 LITERS	GALLONS		COLOR	7	eci!		ODOR: _	NONO	
COLOR:	(	loud	y OD	OR: NO NUL		FILTRAT	E (0.45 um)	YES	s `	NO NO		
TURBIDITY FILTRATE COLOR: FILTRATE ODOR:												
□ NONE □ SLIGHT □ MODERATE □ VERY □ QC SAMPLE: □ MS/MSD □ DUP- □ DUP-												
DISPOSAL METHOD: OF GROUND DRUM OTHER COMMENTS: Notworking												
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL PURGE VOLUME												
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	<del> </del>	mg/L)	(NTU)	•	(°C)	(FEET)		
1233	200	7.3 4	1696	- 52-6		/14	36 c	17	<u>. `</u>	5.28		
1337		6.44	1765	-59.7	ļ	4	60	<u>[].</u>	<u> </u>	570		
1242		691	1735	- 28.8	<u> </u>		2.0	{ /-	· プ	530		
1247		696	1695	-59,8			(80	11	.0	્રે કે. <sub>.</sub> ગુ	•	
(253		697	1665	-60.0		1	1.55	1	1.1	530	·   4	
1257		697	1655	-60.5			1.15	1	1.2	53	c 7	
	-										-0	
*************				<del></del>								
							:					
					-							
L			EST IS COMPL	ETE WHEN 2.5	1	SECON	: DEADINGS A	DE W	FLIEN! T'	HE FOLLOW!	NC LIMITS:	
pH: +/-		COND.: +/-				+/- 0.3	TURB: +/-			= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-	
BOTTLES	SFILLED	PRESERVA	ATIVE CODES	A - NONE	В-	HNO3	C - H2SO4	D -	NaOH	E- F	ICL F	
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTERE	D	NUMBE	R SIZE	TY	PE	PRESERVA	TIVE FILTERED	
2	7 Cl	GIAGI	A		N						□ Y □ N	
	250	61	O-		1						□ Y □ N	
(	7-6)	71	A	UY I	N		1				☐ Y ☐ N	
1	761	51	N.		Ń			***************************************			□ Y □ N	
<b>V</b>			<u> </u>		N						□Y □ N	
SHIPPING METHOD: 126 DATE SHIPPED: (1/2) AIRBILL NUMBER:												
COC NUMI	BER:		SIG	GNATURE:		Ŏ	A Property of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Con	DA	TE SIG	SNED: 5		
										<del></del>	· · <del>/ / /                                 </del>	

1 IRC	<b>&lt;&gt;</b>	TR	C
-------	-----------------	----	---

PROJECT	NAME:	CEC V	Veadock LF: 20	022 GW C	PR	EPARED ,			CHEC	KED		
PROJEC1	NUMBE	R: 46409	6.0000.0000	BY:	JJ	DATES	Us B	Y: 3	TK	DATE: 5-18-27		
SAMPLE	ID: Scu	u-Mu	16006	WELL DIAM	METER: 🔽	2"	6" 🗌 (	OTHER				
WELL MAT	WELL MATERIAL:											
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗌 DI		LEACHATE		OTHER				
PUR		TIME: 12	ρ <b>%</b> □A	TE: 7/9/2	•	AMPLE	TIME: \			TES 9 31		
PURGE METHOI		PUMP BAILER	PERISTALTIC F	PUMP		<u> </u>	U CON	DUCTIVI	TY: 130 M mg/	<del></del>		
DEPTH TO	WATER:	A C	Disid		TURBI	DITY: 2.6	NTU	**************************************				
DEPTH TO			T/ PVC		_ 1 NO	NE SLI	 GHT	□ мог	DERATE	□ VERY		
WELL VOL		NA	LITERS	GALLONS			<b>0</b> -0 %	с отн	IFR <sup>.</sup>			
VOLUME			LITERS	GALLONS		R: Chea		ODC		1010		
	(CIVIO VED	14 a/		OR: <b>10014</b>				1000		10110		
COLOR:				UK. LIDTIY		ATE (0.45 um)	YES					
☑ NONE	☐ SL		BIDITY MODERATE	□ VERY		TE COLOR:  MPLE:	/MSD		TRATE ODC			
DISPOSAL	METHOD	: 🖟 GROUI	ND DRUM	OTHER	COMM	IENTS:	ton	سە،	-Kin	د		
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPER		WATER LEVEL	CUMULATIVE PURGE VOLUME		
	(ML/MIN)	(SU)	(umhos/em)	(mV)	( mg/L)	(NTU)	(°C		(FEET)	(GAL OR L)		
1300	200	عرتز	657	~33.C	MM	13.0	18.	Ч	13.1C	INITIAL		
1313		6.90	1309	-356	ŀ	475	NG.	c	1335	1		
1316		10.97	1318	-38.8		4,00	اله	~~~	1305	2		
1323		697	1324	- 48.8		3.05		.9	1335	3		
1336		6.9	1348	_ 48.5		2.85	ع) إ	۰، <b>ر</b>	1325	4		
1333		697	1363	_49.0	V	765	Ιb	O,	1321	7		
										<del></del>		
			***									
pH: +/-		COND.: +/-	TEST IS COMPL 3 % ORP:		.O.: +/- <b>0.3</b>			IN THE F or =</td <td></td> <td>G LIMITS: TEMP.: +/-</td>		G LIMITS: TEMP.: +/-		
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - N	аОН	E - HC	L F		
NUMBER	SIZE	TYPE	PRESERVATI <sup>1</sup>	VE FILTERE	D NUMB	ER SIZE	TYPE	PR	ESERVATI	VE FILTERED		
H	125	9/1951	A		N							
_ <u>ک</u>	LEO	P(	14		N					□ Y □ N		
2	125	PI	19	□ Y Ø	N					OY ON		
2	125	PI	A		N			_				
2	ال	pl	Ä	□ Y I	N					OY ON		
SHIPPING	METHOD:	Court	DA DA	TE SHIPPED:	5/11	1/3)	AIRB	ILL NUM	BER:			
COC NUM	BER:		SIG	GNATURE:		)	DATE	SIGNE	D: (	11//		
			<u> </u>	-		7			<del></del>	1		

# \_**◇** TRC

PROJECT	PROJECT NAME: CEC Weadock LF: 2022 GW C PREPARED CHECKED											
PROJECT	NUMBE	R: 46409	6.0000.0000	В	Y:	JJ	DATES	h	BA: Z	12	DATE:5-18-22	
SAMPLE	ID: MU	U- 57	>R	WELL DI	AMET	ER: 🔽	2"	6" 🗌	OTHER			
WELL MAT	ERIAL:	✓ PVC	SS	IRON 🔲 G	SALVA	NIZED S	TEEL		OTHER			
SAMPLE T	YPE:	☑ GW	□ ww □	sw 🗆 🗆	)I		LEACHATE		OTHER			
PURC	SING	TIME: \	loy DA	TE: 5/9/)	7		r		1434		TES[4] 27	
PURGE METHOD		PUMP BAILER	PERISTALTIC F	PUMP		PH: C	<u>e-86</u> si 5 <u>9.7</u> m		NDUCTIV	'ITY: <u>20</u> IM_ mg.		
DEPTH TO	WATER:	1423	T/ PVC			TURBI	, ( ,	) NTI	<u> </u>			
		1:18.86	T/ PVC			Д NOI	NE SLI	GHT	□ мо	DERATE	☐ VERY	
WELL VOL		NA	LITERS	GALLON	s	TEMPE	RATURE: <u>ໂ</u>	-\_	°C OT	HER:		
VOLUME F	REMOVED	. Q	LITERS	GALLON	ıs	COLOF	: Clea	1	OD	OR:	nonp	
COLOR:	BA	aun	OD	OR: DOM	4	FILTRA	TE (0.45 um)	☐ YES	s 📮	NO	•	
TURBIDITY FILTRATE COLOR: FILTRATE ODOR:												
□ NONE □ SLIGHT □ MODERATE □ VERY QC SAMPLE: □ MS/MSD □ DUP-												
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: O not work is												
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE LEVEL PURGE VOLUME												
	(ML/MIN)		(umhos/cm)	(mV)		mg/L)	(NTU)		(°C)	(FEET)	(GAL OR L)	
1404	200	7.04	2147	もろこつ		M	1050	17-		14.15	INITIAL	
1409		6.88	3348	94.5			Ele		. છ	14.30		
1414		680	2213	110.0			<u>۵۱.</u>	OJ	.4	1430	<u> </u>	
1419	1	4.84	2122	90.0	·		12	f (c	.6	1430	3	
1424		6-88	2650	400			4.0	۲		1470	4	
1429		6.8.8	1995	59.8			4.0	10	٦, ز	1430	7	
1434		688	2000	54.7		V	4.0	(0	יי כ	1430	d	
					_		, -			1, 1,75		
											<b>\$</b>	
										-	*	
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.: +/-</td												
BOTTLES	SFILLED	PRESERV	ATIVE CODES	A - NONE	В-	HNO3	C - H2SO4	D -	NaOH	E - HC	L F	
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTE	RED	NUMB	ER SIZE	TY	PE PI	RESERVATI	VE FILTERED	
2	191	GLASI	A		N						DY DN	
(	JSU	PI	A	□ Y 4	N						□ Y □ N	
1	125	jg	N-	□	J N							
(	760	PI	12	□ Y €	N						□ Y □ N	
2	TL	PI	B		J-W						□ Y □ N	
	SHIPPING METHOD: IN DATE SHIPPED: 5 (1/6) AIRBILL NUMBER:											
COC NUM	BER:		SI	GNATURE:				DA	TE SIGNE	ED:	-///)	

### ?TRC

A										
PROJECT NAME: CEC Weadock LI	: 2022 GW C	PREPARED	CHE	CKED						
PROJECT NUMBER: 464096.0000.000	0 BY:	JJ DATE:	uhr BY: 3k	DATE: 5-18-21						
SAMPLE ID: NW 54R	WELL DIAMET	ER: 🗸 2" 🗌 4" 🗍	6" OTHER							
WELL MATERIAL: PVC SS	☐ IRON ☐ GALVA	NIZED STEEL	OTHER							
SAMPLE TYPE:	□ SW □ DI	LEACHATE	OTHER							
PURGING TIME: 1455	DATE: 5 (9/3)	SAMPLE	TIME: \SIT	DATE:5/9/3						
PURGE ☑ PUMP PERISTALT METHOD: ☐ BAILER	IC PUMP	PH: <u>6.99</u> s		mg/L umhos/cm						
DEPTH TO WATER: (3 800 T/ PVC		TURBIDITY: 3,7	NTU							
DEPTH ТО ВОТТОМ: <u>(7.∂)</u> Т/ РVC		1 3	GHT MODERATE	☐ VERY						
WELL VOLUME: NA LITERS	GALLONS	TEMPERATURE: 1	2.5 ℃ OTHER:							
VOLUME REMOVED: LITERS	GALLONS	COLOR:	ODOR:	nono						
COLOR: BOWN	ODOR: 1014	FILTRATE (0.45 um)								
TURBIDITY		FILTRATE COLOR:	FILTRATE O	DOR:						
☐ NONE ☐ SLIGHT ☐ MODERATI	EVERY	QC SAMPLE: MS	/MSD DUP-							
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: DO NOT WORKING										
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE WATER CUMULATIVE PURGE VOLUME										
(ML/MIN) (SU) (umhos/cr		( mg/L) (NTU)	(°C) (FEET	<u></u>						
1451 240 737 635	90.4	NM 90	17.6 136							
1500 7.02 1250		1 31	10.7 138	3 1						
1505 7.00 12ley	45.8	4	10.6 138	3 <sub>2</sub>						
1510 699 125	9 45.8	4	10.5 138							
1515 699 124		3.75	(0.5 136							
15.30			138							
				+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.: +/-</td										
BOTTLES FILLED PRESERVATIVE COD	ES A-NONE B	- HNO3 C - H2SO4	D - NaOH E -	HCL F						
NUMBER SIZE TYPE PRESERV	ATIVE FILTERED	NUMBER SIZE	TYPE PRESERV	ATIVE FILTERED						
2 12 5 4(MS) A DY IDN										
1 250 Pl A DY DN										
1 (25 D( A DY BN DY DN										
13-70	DY AN			U Y U N						
2 (L) pi B	OY IN			□ Y □ N						
COC NUMBER:	SHIPPING METHOD: LAB Drop off DATE SHIPPED: SIGNATURE: DATE SIGNED:									
				\-///						

<>> "		
-------	--	--

PROJECT	NAME:	CEC V	Veadock LF: 2	022 GW C	PR	EPARED		CHEC	CKED		
PROJECT	NUMBE	R: 46409	3.0000.0000	BY:	JJ	DATE:	ubi BY:	3K	DATE: <b>5-18-22</b>		
SAMPLE	ID: かい	ر حر	P	WELL DIAN	IETER: 🔽	2" 4" 🗌	6" 🗌 OTH	HER			
WELL MATERIAL: PVC SS IRON GALVANIZED STEEL OTHER											
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗌 DI		LEACHATE	□ отн	HER			
PUR	SING	TIME: \C	)3 ( DA	TE:5 9/33	)	AMPLE	TIME: \		875/9/37A		
PURGE METHOD		PUMP BAILER	PERISTALTIC F	PUMP			U CONDU	CTIVITY: 13	<u></u> umhos/cm g/L		
DEPTH TO	) WATER:	(6-61	T/ PVC			DITY: 9. 7	NTU	V			
DEPTH TO BOTTOM: VERY   NONE   SLIGHT   MODERATE   VERY											
WELL VOLUME: NA ☐ LITERS ☐ GALLONS TEMPERATURE: 1.0 °C OTHER:											
VOLUME REMOVED: 2. THE GALLONS COLOR: CLEAN ODOR: 16 NO											
COLOR:	B	Nown	*	OR: <u>no n</u> e	FILTRA	TE (0.45 um)	— □ YES	Ø NO			
		TUR	BIDITY	·····		TE COLOR:		FILTRATE OD	OR:		
NONE	☐ SL		MODERATE	☑ VERY		MPLE: MS	/MSD	DUP-	OK. 1		
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: DO NOT WORKING											
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPERATI	IMATER	CUMULATIVE PURGE VOLUME		
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	. (NTU)	(°C)	(FEET)	(GAL OR L)		
1535	109	739	645	-22.7	NM	86	19.9	6,40	INITIAL		
1540		7.16	1384	.79.5	1	101	11.4	7.02	7.7		
1540		7.13	1389	そらい		18	11.1	700			
1550		7.10	1397	-8 <b>8</b> :7		(0	11.0	700	7.1		
1555		フルし	1396	-88.9		10	110	, रिक्र	ス		
18,00		7.11	1396	-89.0	V	9.75	11.0	707	2.5		
100	~ \						觮	<del>}</del>			
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,										
NC	OTE: STAB	ILIZATION 1	EST IS COMPL	FTF WHEN 3 S	UCCESSIV	F READINGS A	RE WITHIN	THE FOLLOW!	NG LIMITS:		
pH: +/-		COND.: +/-			.O.: +/- <b>0.3</b>			= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-		
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaO	H E-H	CL F		
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTERE	D NUME	ER SIZE	TYPE	PRESERVA	TIVE FILTERED		
2	125	GIASS	A	□ Y <b>4</b>	N				□ Y □ N		
	250	0(	A		N				□ Y □ N		
(	125	p(	<b>M</b>	□ Y <b>1</b>	N				□Y □N		
ì	125	P(	B	□ Y <b>A</b>	И	***************************************			U Y U N		
	-				N				□ Y □ N		
SHIPPING	METHOD:	lab Do	of off DA	ATE SHIPPED:	5/1	//) )	AIRBILL	NUMBER: •			
COC NUMI	BER:			GNATURE:	$\nearrow \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$	1///	DATE S	IGNED:	1//\		
L					7			<del>&gt;/-</del>	<del>"/) '</del>		

# \*>TRC

	# # # # # #	2288									
PROJECT	NAME:	CEC V	Veadock LF: 20	)22 GW C	PR	EPARED		CHEC	KED		
PROJECT	NUMBER	R: 464096	6.0000.0000	BY:	JJ	DATE:	([) BY:	JK	DATE: \$-18-21		
SAMPLE	ID: Jan	, -Mil	18004	WELL DIAM	ETER: 🔽	2" 4"	6" OTHE	R			
WELL MAT	ERIAL:	✓ PVC	ss 🗆	IRON 🗌 GAL	VANIZED S	STEEL	ОТНЕ	R			
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗌 DI		LEACHATE	□ отн	ER			
PURC	GING	TIME:06	) U( DA	TE:5/10/22	s	AMPLE	TIME: Ow	34 DA	TES/10/3)		
PURGE METHOD	·	PUMP BAILER	PERISTALTIC F	UMP	PH: ORP:	<u>6-64</u> s 219.5 m		TIVITY: <u>(</u>	<u>f</u> umhos/cm		
DEPTH TO	WATER:	3,38	T/ PVC		TURBI	1 /5 //	NTU				
DEPTH TO	BOTTOM:	14.72	T/ PVC		<u>_</u> фио	NE SLI	GHT 🔲	MODERATE	□ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS TEMPERATURE: LOO COTHER:											
VOLUME REMOVED: LITERS GALLONS COLOR: ODOR: ODOR:											
COLOR:		164	ODO	DR: no r	. FILTRA	TE (0.45 um)	YES	<u> </u>			
TURBIDITY FILTRATE COLOR: FILTRATE ODOR: OC. SAMPLE: D. MS/MSD DUP-											
DISPOSAL METHOD: TI GROUND DIDING OTHER COMMENTS: D. A											
DISPOSAL METHOD: A GROUND DRUM OTHER COMMENTS: DO not working											
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE WATER CUMULATIVE PURGE VOLUME											
	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)		
Call	100	400	808	246.0	NM	9.0	14,6	1224	INITIAL		
deig		6.79	1640	2180		3.0	10.4	1250	e 1		
1604		6.63	(637	ગાઇ. ઇ		3.0	61	12.70			
ve 29		10.84	1644	2190		2.0	10.0	1785	1,5		
C634		6.84	1650	219.5	7	190	10.0	1245	)		
1-699						1 5 4			-2.4		
0.0									-3-		
·											
NC NC	TE: STAB	ILIZATION	I TEST IS COMPL	ETE WHEN 3 S	UCCESSIV	/E READINGS /	RE WITHIN T	HE FOLLOWIN	G LIMITS:		
pH: +/-	0.1	COND.: +/-	3 % ORP:	<b>+/- 10</b> D.	O.: +/- <b>0.3</b>	TURB: +/-	<b>10</b> % or	= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-		
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaOl-	I E-HO	CL F		
NUMBER	SIZE	TYPE	PRESERVATI	/E FILTERE	D NUME	BER SIZE	TYPE	PRESERVAT	VE FILTERED		
2	125	GASI	A		N				□ Y □ N		
1	كالتي	19	4		N				□ Y □ N		
	125	PI	4		N				П У П И		
1	125	70	B	□ Y D	N			***************************************	□ Y □ N		
اغ	الْا	19	B	□ Y Ø	<del></del>						
SHIPPING	METHOD:	lab N	TOP OSS DA	TE SHIPPED:	-1	(//)	AIRBILL	NUMBER: ~			
COC NUM	<del></del>	1000 131		GNATURE:	<del>-&gt;+</del>	H 1 1 / _	DATE SIG		11/1		
<u> </u>		. = = = = = =			7		<del>: l</del>		<del>''     </del>		

# **TRC**

PROJECT NAME: CEC Weadock LF: 2022 GW C	PREPARED	CHECKED
PROJECT NUMBER: 464096.0000.0000 BY:	JJ DATES (U)	BY: JR DATE:5-18-21
SAMPLE ID: Sow Ow - 18004 WELL DIAMETER: 2" 4" 6" OTHER		
WELL MATERIAL: PVC SS IRON GALVANIZED STEEL OTHER		
SAMPLE TYPE:		
PURGING TIME: UTO DATE: 5 (C )	SAMPLE TIME	107X DATE:510131
PURGE		
DEPTH TO WATER: 4,37 T/ PVC TURBIDITY: 20 NTU		
DEPTH TO BOTTOM: 14 8 T/ PVC		
WELL VOLUME: NA LITERS GALLONS TEMPERATURE: 4.3 °C OTHER:		
VOLUME REMOVED: 3 LITERS GALLONS	COLOR: CLOCK	ODOR: NON
COLOR: COLOR: NON- FILTRATE (0.45 um) YES ANO		
TURBIDITY  LINONE SLIGHT MODERATE VERY	GC SAMPLE: MS/MSD	FILTRATE ODOR:
DISPOSAL METHOD: J-GROUND   DRUM   OTHER   COMMENTS: Not working		
TIME PURGE PH CONDUCTIVITY ORP		PERATURE WATER CUMULATIVE LEVEL PURGE VOLUME
(ML/MIN) (SU) (umhos/cm) (mV)	( mg/L) (NTU)	(°C) (FEET) (GAL OR L)
0700 109 7.13 670 218		5.2 (4.3.3 INITIAL
0705 694 1555 219	30 9	(6 7.51)
0710 693 1547 216	20 9	.4 8.65 1
0715 642 1542 213	a.c   c	7.4 Glac 1, 1
5730 492 1546 213	V 20 9	1.3 q.U( 2
	<b>'</b>	-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.: +/-</td		
BÖTTLES FILLED PRESERVATIVE CODES A - NONE E	3 - HNO3 C - H2SO4 D	O - NaOH E - HCL F
NUMBER SIZE TYPE PRESERVATIVE FILTERED	NUMBER SIZE T	YPE PRESERVATIVE FILTERED
2 125 CHACO A DY 111	1	
1 250 BI A 11 X	1	□ Y □ N
1 1 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A	<b>v</b>	
1 125 DI B - 1	1	
	1	
SHIPPING METHOD: LAS DOWN OFF DATE SHIPPED: ( ) AIRBILL NUMBER:		
COC NUMBER: SIGNATURE: DATE SIGNED: \$\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}\frac{1}{1}\frac{1}\frac{1}\		

# TRC

				· ·										
PROJECT	NAME:	CEC V	Veadock LF: 20	)22 GW C	PŔ	EPARED			CHEC	KED				
PROJECT	NUMBER	R: 464096	5.0000.0000	BY:	JJ	DATE: 7	uls'	BY: J	K	DATE:5-18-23				
SAMPLE	D: MC	U 55	· .	WELL DIA	METER: 🗸	2"	6" 🗌	OTHER						
WELL MAT	ERIAL:	☑ PVC	ss 🗆	IRON 🗌 GAI	LVANIZED S	STEEL		OTHER						
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗆 DI		LEACHATE		OTHER						
PURC	SING	TIME:07	13 & DA	TE: 5/10/	3) S	AMPLE	TIME	181	3 D/	ATE:5/10/37				
PURGE	<b>V</b>	PUMP	PERISTALTIC F		PH: (	و کور s	u co	NDUCTI		91 umhos/cm				
METHOD	):	BAILER			ORP:	_ <u>رئي آ</u> س	V DO:		NM mg	J/L				
DEPTH TO			T/ PVC		TURBI	DITY: 5,C	NTU	J						
DEPTH TO	воттом	<u>lle38</u>	T/ PVC		<b>∄</b> -₩0		GHT	☐ MC	DDERATE	☐ VERY				
WELL VOL	UME:	NA	LITERS	GALLONS	TEMPE	RATURE: 4		°C 01	THER:					
VOLUME F			LITERS	GALLONS	COLO	R:	ew	OE	OOR:	nore				
COLOR:	<u> B1</u>	BU A	OD(	OR: <u>MON</u>	<u>ℓ</u> FILTRA	TE (0.45 um)	☐ YES	₃ <b>, ∉</b>	L NO					
TURBIDITY FILTRATE COLOR: FILTRATE ODOR: QC SAMPLE: MS/MSD DUP-														
□ NONE □ SLIGHT □ MODERATE □ VERY QC SAMPLE: □ MS/MSD □ DUP- □ DISPOSAL METHOD: □ GROUND □ DRUM □ OTHER COMMENTS: ○ Notworking														
DISPOSAL	METHOD	:JJL-GROUN	ND   DRUM	☐ OTHER	COMN	MENTS: (X	$\frac{n}{2}$	ot le	100 KK	ng l				
TIME	PURGE RATE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPI	ERATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME				
,	(ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)		(°C)	(FEET)	(GAL OR L)				
073 4	200	7.20	733	-52-1	NM	510	12	<i>'</i> 3	13.79	1				
0743		703	1464	ーレスン	l	હિઇ	9,	9	1381					
U748		6.98	1460	- 59.6		<b>રે</b> હ	9.	つ	(38)	2				
0753		697	1465	-59.7		19	9.	9	1381					
6756		4.96	1479	-428		9,0	9	E	1387					
0803		6.96	1487	- 4 <b>5</b> 8		60	9	4	1381					
0808		4.94		- 65.9		5.0		<u> </u>	1365					
0613		696	1495	- 65.5		5.0	<del></del>	.7	1385	~~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~				
ارتان					<u> </u>	9.0		· - /		<del> </del>				
					<del> </del>					+				
L					1	(E DEADINGS	<u> </u>	T. 1161 T. 15		LO LIBRITO				
<b>N</b> С pH: +/-			TEST IS COMPL 3 % ORP:		D.O.: +/- <b>0.3</b>									
BOTTLES	FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D-	NaOH	E-H	CL F				
NUMBER	SIZE	TYPE	PRESERVATI	/E FILTERE	ED NUME	BER SIZE	TYI	PE F	PRESERVAT	TIVE FILTERED				
٦	761	glass	A		N					OY ON				
Ĭ	250	Pi	A							□ Y □ N				
1	761	61	A	□ Y Q	N					O Y O N				
(	125	61	13		N					N D				
2	IL	PI	B		N				The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	□ Y □ N				
SHIPPING	METHOD:	lab (	Sop off DA	TE SHIPPED:	7 1	1/21	AIF	RBILL NU	JMBER:					
COC NUME	BER:			GNATURE:	3) 1	<i>11'')</i>	DA	TE SIGN	IED:	-11/12				
					$\overline{}$	T			<u>&gt;</u>	, , , , , , , , , , , , , , , , , , , ,				

	TR	
AT .	B B 47	- Children

PROJECT NAME:	CEC Weadock L	F: 2022 GW C	PREPAR	ED		CHECK	ED							
PROJECT NUMBER	R: 464096.0000.000	00 BY:	JJ DA	TE: Elub	BA: 2K	D	ATE: 5-18-22							
SAMPLE ID:	r· ら \	WELL DIAME	TER: 🗸 2" 🗌	] 4" 🗌 6" 🗌	OTHER									
WELL MATERIAL:	✓ PVC SS	☐ IRON ☐ GALV	ANIZED STEEL		OTHER									
SAMPLE TYPE:	☑ GW ☐ WW	SW DI	☐ LEACH	HATE [	] OTHER									
PURGING	TIME: COO W	DATE: 5 (10(3)	SAMPL		0906		E:5 10 35							
PURGE  METHOD:	PUMP PERISTAL BAILER	TIC PUMP	PH: 7.3		ONDUCTIVIT									
DEPTH TO WATER:			TURBIDITY:	9.0 N										
DEPTH TO BOTTOM	C. C. C. BVC		NONE	SLIGHT		ERATE	☐ VERY							
WELL VOLUME:	NA LITERS	GALLONS	TEMPERATU		_°С ОТН									
VOLUME REMOVED			COLOR:	Clear	ODO		one							
	Drownish			45 um)	<del></del>									
COLOR:		ODON. TOTAL												
TURBIDITY    FILTRATE COLOR:   FILTRATE ODOR:														
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: 130 Not WORNIE WATER CUMULATIVE														
	1 1 1 1 1 1 1 1 -		1			-								
0841 100	7.54 58	F -12-9	NM 5'	4 11	و ل	6.36	INITIAL							
0846	290 199	~ -77:7	le	0 1	1.0	7.18	<u>, 5`</u>							
0851	7.27 173	1 -853	1		0-7	7,46								
0896	7.26 123	1 . 65.3	٥	1.0 1	0.9	<b>%</b> ૫૦	1.7							
0901	7.25 173	6 - 85.1		1.0 1	1.0	865	2							
0906		4-850			11.0	4.25	7,5							
0911							3							
L.,	BILIZATION TEST IS CO	OMPLETE WHEN 3 SU	ICCESSIVE REA	ADINGS ARE W	ITHIN THE F	OLLOWING	LIMITS:							
pH: +/- <b>0.1</b>				URB: +/- <b>10 %</b>		_	ΓΕΜΡ.: +/-							
BOTTLES FILLED	PRESERVATIVE COI	DES A - NONE E	B - HNO3 C	- H2SO4 E	- NaOH	E - HCI	_ F							
NUMBER SIZE	TYPE PRESER	VATIVE FILTERED	NUMBER	SIZE T	YPE PR	ESERVATIV	/E FILTERED							
2 125	glass A		N				N C							
1 250	PIA		N				□ Y □ N							
1 125	pl A	□ Y B	N				N N Y							
( 125	PIB	口y便	N				□ Y □ N							
1			N				□ Y □ N							
SHIPPING METHOD	lab Drop of	DATE SHIPPED:	5/11/	))	AIRBILL NUM	IBER: -								
COC NUMBER:	1-0 1010	SIGNATURE:			DATE SIGNE	D: (	1/1/>-							
L			<i>→ X</i> =			≠	<del>, '                                     </del>							

# ?TRC

PROJECT NAME:	CEC V	Veadock LF: 20	)22 GW C		PRI	EPARED			CHEC	KED
PROJECT NUMB	ER: 46409	6.0000.0000	BY:		IJ	DATE:	<del>ıbı</del>	BY: 2	SIL	DATE: 5-18-22
SAMPLE ID: 30	·ce-mu	J-1800 9	WELL DIAM	ETER	ર: ☑	2" 🗌 4" 🔲	6" 🗌	OTHER		
WELL MATERIAL:	☑ PVC	□ss □	IRON ☐ GAL	VANIZ	ZED S	TEEL		OTHER		
SAMPLE TYPE:	☑ GW	□ ww □	SW 🗌 DI			LEACHATE		OTHER		
PURGING	TIME:0	124 DA	TES 10/32			AMPLE	TIME:	100		TE:5/10/37
PURGE E	✓ PUMP  BAILER	PERISTALTIC F	PUMP		H: NRP:	<u>६.७५</u> s ५७.७ m		NDUCTIV	/ITY: <u>しと</u> <mark>/ハ</mark> mg	
DEPTH TO WATER	₹ <del>8.33</del>	T/ PVC			URBI		NT	U		
DEPTH TO BOTTO	м: <u>(С. 3</u> 8	T/ PVC		_ [_	IOH	NE SLI	GHŢ	□ мо	DERATE	☐ VERY
WELL VOLUME:	NA	LITERS	GALLONS	ТІ	EMPE	RATURE:	18	_℃ от	HER:	
VOLUME REMOVE	:D:	. LITERS	GALLONS	С	OLOF	<sub>د (</sub> (او	CCV	OE	OR:	101V
COLOR:	LANG	OD OD	OR: MON	_ FI	LTRA	TE (0.45 um)	YE	s <b>5</b>	-NO	
		BIDITY		<del> </del>		TE COLOR:		FII	LTRATE ODG	)R:
		MODERATE	VERY			MPLE: MS			DUP-	
DISPOSAL METHO	D: X GROU	ND DRUM	OTHER		OMM	ENTS:	_D(	17 W	or kin	
TIME PURGE	I PH	CONDUCTIVITY	ORP	D.	О.	TURBIDITY	TEMP	ERATURE	WATER LEVEL	CUMULATIVE PURGE VOLUME
(ML/MIN	1	(umhos/cm)	(mV)	( m	g/L)	(NTU)		(°C)	(FEET)	(GAL OR L)
0924 164	1694	(80)	140	pr	4	988	()	۱. 4	ي ي	INITIAL
0939	(e-7)	1880	59.1			183	เอ	·.>	9.15	<i>i</i> , <i>i</i>
6934	しつく	1476	7 (e.			હિલ	13	. 7	9.33	1.
6939	6.75	1876	85.7			28	เว	(,)	9.40	1.5
0944	6.75		930			93	じ	ررك	લ્.५٢	J
6949	675	1862	970			18	17	۷.۶	C1.58	2.1
0954	6.75	1857	97.0			10	t.	2.9	9,00	3
0959	Ce-76		97:5			10		1.9	9 51	3.0
1004	6.76	1815	97.8	1	7	(0)	(	ર્. ૯	9.54	4
1009										4.5
NOTE: STA	ABILIZATION	TEST IS COMPL	ETE WHEN 3 S	UCCE	ESSIV	E READINGS A	ARE WI	THIN THE	FOLLOWIN	IG LIMITS:
pH: +/- <b>0.1</b>	COND.: +/-	3 % ORP:	+/- <b>10</b> D	.O.: +	/- 0.3	TURB: +/-	10 %	or </td <td>= 10</td> <td>TEMP.: +/-</td>	= 10	TEMP.: +/-
BOTTLES FILLED	PRESERV	ATIVE CODES	A - NONE	B - F	INO3	C - H2SO4	D	- NaOH	E - H(	CL F
NUMBER SIZE	TYPE	PRESERVATI	VE FILTERE	D I	NUMB	ER SIZE	TY	PE F	PRESERVAT	IVE FILTERED
2 125	GLACI	A		N						
250	PI	A		N						U Y U N
1125	PI	A		N						
129	01	B		N	****					□Y □N
2 ル	pi	B		N						□ Y □ N
SHIPPING METHO	D: lab D	rop off D	ATE SHIPPED:	1	111	752	AI	RBILL NU	MBER: -	
COC NUMBER:			GNATURE:	$\stackrel{\Rightarrow}{=}$	$\overset{\sim}{}$	10	D	ATE SIGN	IED:	111/1-
1	١ ــــــــــــــــــــــــــــــــــــ			_			- 1			<del></del>

	TRC
AST .	

PROJEC	T NAME:	CEC	Weadock LF: 2	2022 GW C	P	REPARED		CHE	CKED					
PROJEC	T NUMBE	R: 46409	96.0000.0000	BY	JJ	DATES	u()" BY:		DATE: 5-18-21					
SAMPLE	ID: ()	Ur 57	Rout	WELL DIA	METER:	2"	] 6"   OTI	HER						
WELL MA	ΓERIAL:	☑ PVC	ss 🗆	IRON 🗌 GA	LVANIZED	STEEL	□ оті	HER						
SAMPLE T	YPE:	☑ GW	□ ww □	SW 🗌 DI		] LEACHATE	□ оті	HER						
PUR	GING	TIME: 10	54 ( D	ATE: 5 \10	97	SAMPLE	TIME: []	05	DATE: S/10/2					
PURGE		PUMP	PERISTALTIC		PH:	707	SU CONDU	CTIVITY: 13	기선 umhos/cm					
METHO	L.	BAILER			ORP:	(OO r	nV DO:	_ <b>/</b> //^/m	ng/L					
		20.60	-		TUR	BIDITY: 3.8	<b>∇</b> NTU							
		1: <u>7</u> 0, tq	<del></del>		T N		_	MODERATE	☐ VERY					
WELL VOL		NA NA	LITERS	GALLONS		ERATURE:	<u>ઽ</u> ં.મ_ ∘c	OTHER: _						
VOLUME	REMOVE		LITERS	GALLONS		DR: C/WW /			none					
COLOR:		1001/		OR: OO O	_ FILTR	ATE (0.45 um)	YES	1 NO						
<b>∄</b> NONE	□ e₁		BIDITY			ATE COLOR:		FILTRATE OD	OR:					
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: DO not working														
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS: DO not working														
TIME PURGE PH CONDUCTIVITY ORP D.O. TURBIDITY TEMPERATURE WATER COLLEVEL PUR														
	(ML/MIN)	<del></del>	(umhos/cm)	(mV)	( mg/L)	(NTU)	(°C)	(FEET)	(GAL OR L)					
1045	100	7.35	1245	10/6.	NM	(1.0	21.6	८८५						
10 50		7.08	1293	102-3		(Q,	lle,c	してい	7, [.					
10 71		707	1293	100		4	159	1075	1 (					
1100		707	1296	99.5		4.	15-8	1118	1.7					
noi		רטר	1290	100	$\Psi$	3.85	15.9		9					
410	-							i V	2.6					
					***************************************									
						<u> </u>			13:4					
	******													
									<del> </del>					
		·	FST IS COMPI	ETE WHEN 3 S	IICCE88IV	/E DEADINGS A	DE WITHIAL ?		10.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.					
pH: +/-		COND.: +/-			O.: +/- <b>0.</b> 3			= 10</td <td>TEMP.: +/-</td>	TEMP.: +/-					
BOTTLES	FILLED	PRESERVA	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	D - NaOl	H E- H	CL F					
NUMBER	SIZE	TYPE	PRESERVATIV	/E FILTEREI	O NUME	BER SIZE	TYPE	PRESERVAT	IVE FILTERED					
2	las	9/457	A		N				U Y U N					
	250	10	A		N				□Y □N					
	(25	191	A		N									
(	127	101	B	□ Y 1 <u>7</u>	Ń		***************************************		OY ON					
2	ال	DI	B	□										
SHIPPING N	METHOD:	lab On		TE SHIPPED:	7/1	//>>	AIRBILL I	NUMBER:						
COC NUMB	ER:	<del></del>	-	NATURE:		, <i>, , , , , , , , , , , , , , , , , , </i>	DATE SIG	GNED:	1.11					
					1	<b>}</b>		T-	1/118					

# TRC

PROJECT NAME:	CEC V	Veadock LF: 20	022 GW C	PR	EPARED			CHEC	KED
PROJECT NUMBER	R: 464096	5.0000.0000	BY:	JJ	DATE: S/L	1/2	BY: 34	<u> </u>	DATE: \$-18-22
SAMPLE ID: 🔾	B -1	1	WELL DIAM	METER: [√]	2"		OTHER		
	√ <b>b</b> − 0		IRON □ GAI				OTHER		
	☑ · VO ☑ GW		sw <del>1 DI</del>		LEACHATE		OTHER		
			-J	<del></del>					<u> </u>
PURGING	TIME:	<u>-</u>	TE:	S	AMPLE		1135	<del></del>	TE:5/10/3)
METHOD:	PUMP BAILER	PERISTALTIC F	PUMP	PH: ORP:		U CO V DO:	NDUCTIVI	TY: <u>//</u> ) /\ mg	umhos/cm /L
DEPTH TO WATER:	7	T/ PVC		TURBI		NTU	ر		
DEPTH ТО <b>Р</b> ОТТОМ:		T/ FVC	+	□ No	NE 🗌 SLI	GHT	☐ MOI	DERATE	☐ VERY
WELL VOLUME:	NA	☐ LITERS	GALLONS	TEMPE	RATURE: 1	<u>八、</u>	°C OT⊦	IER:	
VOLUME REMOVED:		LITERS	☐ GALLONS	COLO	R: <u>U</u> 4	201	ODO	DR: (C	101
COLOR: C		OD	OR:	_ FILTRA	TE (0.45 um)	☐ YES		NO	
	TUR	BIDITY	<del></del>	FILTRA	TE COLOR:		FIL	TRATE ODG	OR:
☐ NONE ☐ SLI	GHT 🔲	MODERATE	☐ VERY	QC SA	MPLE: 🗌 MS	/MSD		DUP-	
DISPOSAL METHOD:	GROUN	ND 🗌 DRUM	OTHER	COMM	IENTS:				
TIME PURGE	PH	CONDUCTIVITY	ORP	D.O.	TURBIDITY	TEMPI	ERATURE	WATER	CUMULATIVE
RATE (ML/MIN)	(SU)	(umhos/cm)	(mV)	( mg/L)	(NTU)		(°C)	LEVEL (FEET)	PURGE VOLUME (GAL OR L)
	(5-5)	(	(,						INITIAL
			**************************************	<u> </u>		l			
									<u> </u>
				<u> </u>				<u> </u>	<u> </u>
						ļ	***************************************		<u> </u>
		(				<u> </u>		1	4
		w		ļ		<u> </u>			
						ļ			
NOTE: STAR	I IZATION "	TEST IS COMPL	FTE WHEN 3 S	SUCCESSIV	E READINGS	ARF WIT	THIN THE	FOLLOWIN	-'IG LIMITS:
	COND.: +/-			D.O.: +/- <b>0.3</b>					TEMP.: +/-
BOTTLES FILLED	PRESERV	ATIVE CODES	A - NONE	B - HNO3	C - H2SO4	1 D-	NaOH	E - H(	CL F
NUMBER SIZE	TYPE	PRESERVATI	VE FILTERE	ED NUME	BER SIZE	TY	PE PF	RESERVAT	IVE FILTERED
1 125	P	A		N					□ Y □ N
1 125	151	B	□ Y D	N					□ Y □ N
2 1	01	B	□ Y IÆ	N					☐ Y ☐ N
	<b></b>			N					□Y □N
				N		1			□Y □N
SHIPPING METHOD:	leb M	ec D	ATE SHIPPED:	<u> </u>	11/11	AIF	RBILL NUM	1BER: -	
COC NUMBER:	140 M		GNATURE:	->/	4 12 )	=	TE SIGNE		11/1-
GOO NOMBLIX.		31	O.A. (TOILE.	-	1		01014	<u> </u>	11(1)

# \*> TRC

PROJECT	NAME:	CEC W	/eadock LF: 20	22 GW C		PREI	PARED			CHEC	KED			
PROJECT	NUMBER	R: 464096	3.0000.0000		BY:	JJ	DATE:	um	BY: 3K		DATE:5-18-22			
SAMPLE	D: F1	B # C	) (	WELL C	IAMET	ER: 🗾 2'	"	6" 🗌	OTHER					
WELL MATI	ERIAL:	✓ PVC	□ss □	IRON 🔲	GALVAI	NIZED STI	EEL		OTHER					
SAMPLE TY	YPE:	☑ GW	□ ww 🗆	sw 🦈	DI	LE	EACHATE		OTHER					
PURG	SING	TIME:	DA <sup>-</sup>	TE:			MPLE	TIME:	1140		TE:3 (0/3)			
PURGE METHOD	. —	PUMP BAILER	PERISTALTIC P	UMP		PH:	<b>∕</b>		NDUCTIVI <u>(1)</u>					
DEPTH TO	WATER:		T/ <b>/</b> PVC	M		TURBIDI	TY: <u>~\ \</u>	NTU	J					
DEPTH TO	воттом:	<u> </u>	T/ FVC	<del>/                                    </del>		MONE	≣ □ sLi	GH <b>T</b>	□ мог	DERATE	☐ VERY			
WELL VOK	/	\NA	LITERS	GALLO	NS	TEMPER	ATURE: 1		°C OTH	IER:				
VOLUME F			LITERS	GALLO	NS	COLOR:	(10)		ODC	DR:	01			
COLOR		_	ODO	DR:			E (0.45 um)	T YES		NO NO				
33231		THE	BIDITY			FILTRATE			/	TRATE ODC	ng.			
□ NONE	☐ SLI		MODERATE	☐ VEF	RY		PLE: MS	/MSD		DUP-				
DISPOSAL	METHOD:	☐ GROUN	ID DRUM	OTHER		СОММЕ	NTS:							
DISPOSAL METHOD: GROUND DRUM OTHER COMMENTS:  TIME PURGE PH CONDUCTIVITY ORP D.O. TURRIDITY TEMPERATURE WATER CUMULATIVE														
TIIVIE	RATE (ML/MIN)	(SU)	(umhos/cm)	(mV)		mg/L)	(NTU)		(°C)	LEVEL (FEET)	PURGE VOLUME (GAL OR L)			
	(IVIL/IVIIIV)	(30)	(umnos/cm)	(1117)		ilig/L)	(1410)	'	. 0)	(,,	INITIAL			
				<del></del>										
							,							
				************************										
- 41														
							***************************************	<b></b>						
						-								
								ļ						
·				,				<u> </u>		<u> </u>				
NC	TE: STAB	ILIZATION 1	TEST IS COMPL	ETE WHEN	3 SUC	CESSIVE	READINGS A	ARE WIT	THIN THE	FOLLOWIN	IG LIMITS:			
pH: +/-	0.1	COND.: +/-	3 % ORP:	+/- 10	D.O.:	+/- 0.3	TURB: +/-	10 %	or =</td <td>10</td> <td>TEMP.: +/-</td>	10	TEMP.: +/-			
BOTTLES	S FILLED	PRESERV	ATIVE CODES	A - NONE	В-	· HNO3	C - H2SO4	D -	NaOH	E - HO	CL F			
NUMBER	SIZE	TYPE	PRESERVATI	VE FILTI	ERED	NUMBE	R SIZE	TYI	PE PF	RESERVAT	IVE FILTERED			
	761	7(	A	□ Y	M						□Y □N			
1	76)	Pi	B		N						□ Y □ N			
t					□ N					******************	UY UN			
					□ N	<u> </u>					OY ON			
					□ N	<b> </b>		<del> </del>						
SHIPPING	METHOD:	lab bro	-0e D	ATE SHIPPE		<u></u>	(/\>	ΔΙ	RBILL NUM	MBER: -				
ļ		Jab 1500	<del> </del>		_U.	<u> </u>	10)				4.71			
COC NUM	BER:		SI	GNATURE:		$\langle \rangle$		DA	TE SIGNE	.D: 5 /	!// <b>)</b>			

eurofins Environment Testing America MICHIGAN 190 **Chain of Custody Record** Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

	Sampler:	Lab PM: Brooke Krie M	Carrier Tracking No(s):	COC No: 240-94784-33306.1
Cilent Information	2	E-Mail:	State of Origin:	Page:
Cirent Contact: Jacob Krenz:	シスク グング アンバ	E-mail. Kris.Brooks@et.eurofinsus.com		Page 1 of 2
Company: TRC Environmental Corporation.		Analysis	Analysis Requested	Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			eservation Cod - HCL
City: Ann Arbor	TAT Requested (days):	3.6		- NaOH - Zn Acetate
State, Zp: Mi, 48108-7080	Compliance Project: A Yes A No	3 2 122		E - NMIC AGG P - NAZOGS E - NAHSO4 Q - NAZSO3 F - M6OH R - NAZSZO3
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	Po# TBD	: (Q)		G - Amchlor H - Ascorbic Acid
Email: JKrenz@trccompanies.com	WO#	(40) g):	Sid	I - Ice J - Di Water K - FDTA
Project Name: Karn/Weadock CCR JCW Ash Pond	Project #. 24024154	EPC	Ule304	
Site:	:XSOW#:	7558 (S) (S)	55161	Other
	0		egwniyjeto	Coorist Instructions (Myto.
Sample Identification	Sample Date Time G=grab)	BT-Tissue, A-Air) ILS Go		
JCW-MW-18001	1	water N 14 F F		
JCW-MW-18004		water AU TH	(2) (A)	S. Constant
JCW-MW-18005	) 703	water AC + f		
JCW-MW-18006	2/4/2x 1373 6	water ピットナ		
MW-50	2) rosa (1912	Water NV (-C		
MW-51	5 1913 1917 G	Water ピルドド		
MW-52	5/4/27 1070 10	water CAT-		
MW-53	न्।।। ८६।३।	Water Urff		
MW-53R	3/9/3/ 1/434 6	Water NV T		28
MW-54R	9 2161 415/5	water いんよ ホ		
MW-55	र् । प्राक्षेत्र (८) व	water Mr F F		:
Possible Hazard Identification	Doison B Haknown Badiological		Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client  Disposal By Lab  Archive ForMont	hs
ested: I, II, III, IV, Other (specify)			uirements:	
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:	
Relinquished by:	Date Mill 92	く	4	33 COMPANY COMPANY CO
Relinquished by:	Date/Time:	Company Received by:	Date/Time: 4	
Relinquished by:	Date/Time:	Company Received by:	Date/Time:	Сомрапу
Custody Seals Intact: Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	Other Remarks:	
∆ Yes ∆ NO				Ver 06/08/2021

																				ρq	2	90	f:	31		
	Page l of		QA REQUIREMENT:	☐ NPDES	INI 🛭	☐ ISO 17025	☐ 10 CFR 50 APP. B	☐ INTERNAL INFO		REMARKS											-				#: 01542	Cal. Due Date: 6-5-22
		_ ا	ded)	-																					M&TE#:	Cal. Di
		FSTET	e is Nee																						% 	o <b>3</b>
	Š	ANAI VSIS REOITESTED	(Attach List if More Space is Needed)																						Kes C	Temperature: <del>S.2 - 6.0</del> °C <b>EB o Sil 2 L</b>
	SERVICES	SISAI	ist if M						Vinite		×	×	×	×	×	×	×	×	×	×	×	×	ſS:		Received on Ice? Myes [	4:3
	ERV	ANA	Attach I						suo	inA 2GT	×	× ×	×	×	×	×	×	× ×	×	× ×	×	×	COMMENTS:		eived or	peratur
	XX S. 251		T				ı	tals	al Me	othe Tot	×	×	×	×	×	×	×	×	×	×	×	×	COJ		Rec	Ten
X(	<b>)RATORY</b> (517) 788-1251						SRS	ATIVE	Н	MeO HCI																
10	<b>)RA</b> (517)		gister				CONTAINERS	PRESERVATIVE	, l	N <sup>g</sup> O: H <sup>r</sup> 2C											1		-			
Ţ	AB(		rold Re				Ő			onoM	5 4 1	5 4 1	5 4 1	5 4 1	5 4 1	5 4 1	4	4	4	4	4	5				
	7 <b>− L</b> ∏ 492	:#OM	ER: Ha		⊠ OTHER				# IVG	.0.1.			7,		7,			**								
CHAIN OF CUSTODY	Y COMPANY – LA L ST., JACKSON, MI 49201	SAP CC or WO#:	REQUESTER: Harold Register	·	☐ STANDARD	phone:	X = Other	L = Sludge	WP = Wipe WT = General Waste	O/LOCATION													RECEIVED BY:		RECEIVED BY:	
CHA	CONSUMERS ENERGY COMPANY – LABORATORY 135 WEST TRAIL ST., JACKSON, MI 49201 · (517) 788-1251	PROJECT NUMBER:	22-0441	TURNAROUND TIME REQUIRED:	□ 24 HR □ 48 HR □ 3 DAYS	email:	MATRIX CODES: GW = Groundwater	WW = Wastewater S W = Water / Aqueous Liquid A	S = Soil / General Solid V O = Oil	FIELD SAMPLE ID	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	ME:	260	IME:	
	CON									TAM	GW	GW	GW	ВW	GW	GW	ĞΨ	СW	МÐ	СW	GW	ВW	DATE/TIME	t////	DATE/TIME	
·							iter		LECTION	TIME	inor.	7,30	(00%	1339	いる	S	ن <i>ح0ا</i>	1109	MisH	1315	7330	5.011				
	<b>Energy</b> Count on Us <sup>©</sup>	STOMER:	orewater Wells			Caleb Batts	Harold Register	TRC	SAMPLE COLLECTION	DATE '	5/4/2)	slic/s	र्वाञा	5/4/2	5/9/22	S 6 31	5/9/23	८८१५५	5 19125	5/9/35	5/w/3>	5/10/27	] (			_
	Consumers Energy Counton	SAMPLING SITE / CUSTOMER:	Q2-2022 Weadock Porewater Wells	SAMPLING TEAM:		SEND REPORT TO:	COPY TO:		LAB	SAMPLE ID	22-0441-01	-02	-03	-04	-05	90-	-07	80-	60-	-10	-11	-12	RELINQUISHED BY:		RELINQUISHED BY	<b>ر</b>

		•																	 	ρg_	30	of 31	
	Page 2 of 2	OA REOTHREMENT.	Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Contro	□ NPDES	INI 🛭	□ ISO 17025	☐ 10 CFR 50 APP. B	☐ INTERNAL INFO	□ OTHER	REMARKS													015402
			ded)																 				M&TE#:_ Cal. Due D
		ANAL YSIS REQUESTED	(Attach List if More Space is Needed)																				S C
	Ñ	REQU	ore Spac																				Received on Ice? LYes   No Temperature: 4.0-5.6 °C
	TCE	TYSIS	ist if M						Viinile		×	×	×	×	×			·				i Si	lce? [
	ERV	ANA	Attach I						suo	inA EQT	×	×	×	×	×	×	×					COMMENTS:	eived on
	Y S]		٢					tals	aM la		×	×	×	×	×	×	×					Ö	Rec
7	ORATORY • (517) 788-1251						RS	ATIVE	Н	MeC MeC									 				
	(517)		ister				CONTAINERS	PRESERVATIVE	H tC	N <sup>g</sup> O													
L	\B0		ld Reg				CON		6	НИС Иопо	4	4	4 1	3 1	3 1		1		 				
	- L/	/O#:	R: Harc		☑ OTHER				LVF #	T.O.T	5	3	5	4	4	7	. 7						
N OF CUSTODY	C <b>OMPANY</b> F. JACKSON, M	SAP CC or WO#:	REQUESTER: Harold Register		STANDARD	phone:	Other	Judge	WP = Wipe WT = General Waste	/LOCATION										-		RECEIVED BY:	RECHIVED BY:
CHAIN	CONSUMERS ENERGY COMPANY – LABORATORY SERVICES 135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251	PROJECT NUMBER:	22-0441	TURNAROUND TIME REQUIRED:	□ 24 HR □ 3 DAYS □	il:	RIX CODES:  GW = Groundwater  OX = C	WW = Wastewater SL = S $W = Water / Aqueous Liquid A = Ai$	S = Soil / General Solid WP = O = Oil WT =	FIELD SAMPLE ID/I	MW-58	DUP-JCW-LF-01	DUP-JCW-LF-02	JCW-MW-18001 MS	JCW-MW-18001 MSD	FB-01	EB-01			17.4		3830	
	ISNC	PRC		IDI		email:	MA.			TAM	GW	GW	GW	GW	GW	W	W					DATE/TIME:	DATE/TIME
	ŏ						1			·-	_	1	9									AD /	77 / 17 DA
	, v	ļ	"				la la		LECTIC	TIME	135	Į	}	5005	2960	1140	1(35				<u> </u>	١, ر	
	<b>Energy</b> Count on Us <sup>©</sup>	STOMER:	orewater Well:			Caleb Batts	Harold Register	TRC	SAMPLE COLLECTION	DATE	5/9/31	<6/8/5	18/6/28	519133	sigla	5/10/3	-Cloil-						
	<b>Consumers Energy</b> Count on l	SAMPLING SITE / CUSTOMER:	Q2-2022 Weadock Porewater Wells	SAMPLING TEAM:		SEND REPORT TO:	COPY TO:		LAB	SAMPLE ID	22-0441-13	-14	-15	-16	-17	-18	-19					RELINQUISHED BY:	RELINQUISHED BY
		SAM	02-2	SAM		SEN				Š												RELI	RELI

		<b>,</b>			····										 ····	 	 	······································	ρg	71 of	31	
	Page of	OA BEOIMPEMENT.	CA NECOINEMENT:	☐ NPDES	INI 🗵	□ ISO 17025	☐ 10 CFR 50 APP. B	☐ INTERNAL INFO	□ OTHER	REMARKS					-						707	Cai. Due Date: 6-3-22
ŧ.			ded)													 					M&TE	Cal. Du
		ANAL YSIS REQUESTED	(Attach List if More Space is Needed)													 					Š D	ပ္စ
	S	S REQU	Aore Spa						.,,												Received on Ice? Yes 🗆 No	Temperature: <b>S.1 - 6.0</b> °C
	TC1	TYSI	ist if N						yiinile		×	×	×	×						ું સુ	l Ice?	5.5
:	3RV	ANA	ttach L						suo	inA SQT	×	×	×	×		 				COMMENTS	ived on	eratur
	Y SI		₹)					zisi	aM la		×	×	×	×	 					COI	Rece	Tem
	ORATORY • (517) 788-1251							IVE		O <sub>5</sub> M oiliO												
	<b>AT</b> (7)		er.				CONTAINERS	PRESERVATIVE		HCI N <sup>®</sup> O												
0	OR (5]		Regist				ONTA	PRESE	٤(	OS <sup>7</sup> H ONH		-	-									
	.AB		arold ]				Ö	<u> </u>	LAL#	TOT Mon	5 4	5 4	5 4	5 4		 						
	( — ] /II 49:	#0M	ER: H		⊠ OTHER																	
IN OF CUSTODY	<b>COMPANY</b> ST., JACKSON, N	SAP CC or WO#:	REQUESTER: Harold Register	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	☐ STANDARD 🖾	phone:	= Other	= Sludge Air	WP = Wipe WT = General Waste	ID / LOCATION							,			RECEIVED BY:	ECEIVED BY:	
CHAI	CONSUMERS ENERGY COMPANY – LABORATORY SERVICES 135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251	PROJECT NUMBER:	22-0442	TURNAROUND TIME REQUIRED:	□ 24 HR □ 48 HR □ 3 DAYS	email:	AATRIX CODES:  GW = Groundwater OX =	WW = Wastewater W = Water / Aqueous Liquid A =	S = Soil / General Solid WP O = Oil WT	FIELD SAMPLE ID,	JCW-MW-18004	OW-53	OW-54	OW-55						ME.	ME:	
	NO	-					4			TAM	GW	GW	GW	GW	:					DATE/TIME:	DATE/TIME	
	J						ter		ECTION	TIME	5730	(1213	(UP)	11150								
	<b>Energy</b> Count on Us <sup>©</sup>	STOMER:	SD			Caleb Batts	Harold Register	TRC	SAMPLE COLLECTION	DATE	5/10/33	5/9/3>	16/6/5	Slotas						h		
	Consumers Energy Count on U	SAMPLING SITE / CUSTOMER:	Q2-2022 Weadock ASD	SAMPLING TEAM:		SEND REPORT TO:	COPY TO:	·	LAB	SAMPLE ID	22-0442-01	-02	-03	-04						RELINQUISHED BY:	RELINQUISHED BY:	)
	ı	SAMP	Q2-20	SAMP		SENE				SA	2									RELIN	RELIN	



# Appendix G Alternate Source Demonstration Supporting Information



#### A CMS Energy Company

Date: July 25, 2022

To: Operating Record

From: Harold D. Register, Jr., P.E.

RE: Alternate Source Demonstration Professional Engineer Certification, §257.94(e)2

DE Karn Lined Impoundment 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 2021 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.

Signature

July 25, 2022

**Date of Certification** 

Harold D. Register, Jr., P.E.

Name

6201056266

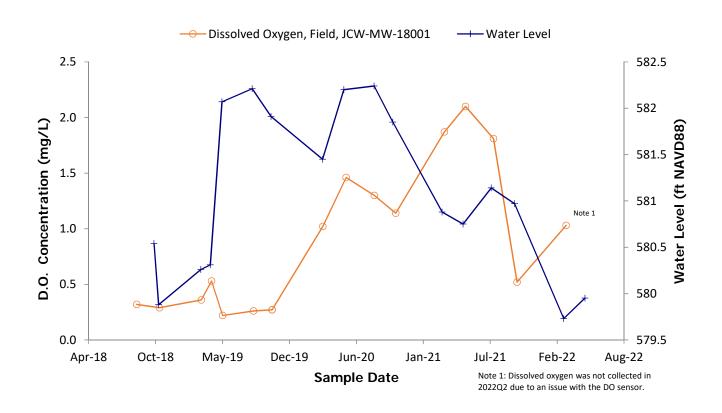
Professional Engineer Certification Number



#### References

TRC (July 2022). <u>First Semi-Annual/Second Quarter 2022 Hydrogeological Monitoring Report,</u> JC Weadock Landfill CCR Unit, Essexville, Michigan

Figure G1: Time Series Plots for Sulfate at JCW-MW-18001 ASD



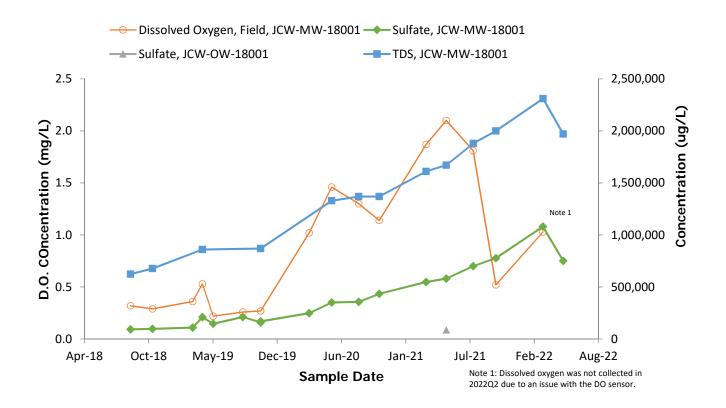


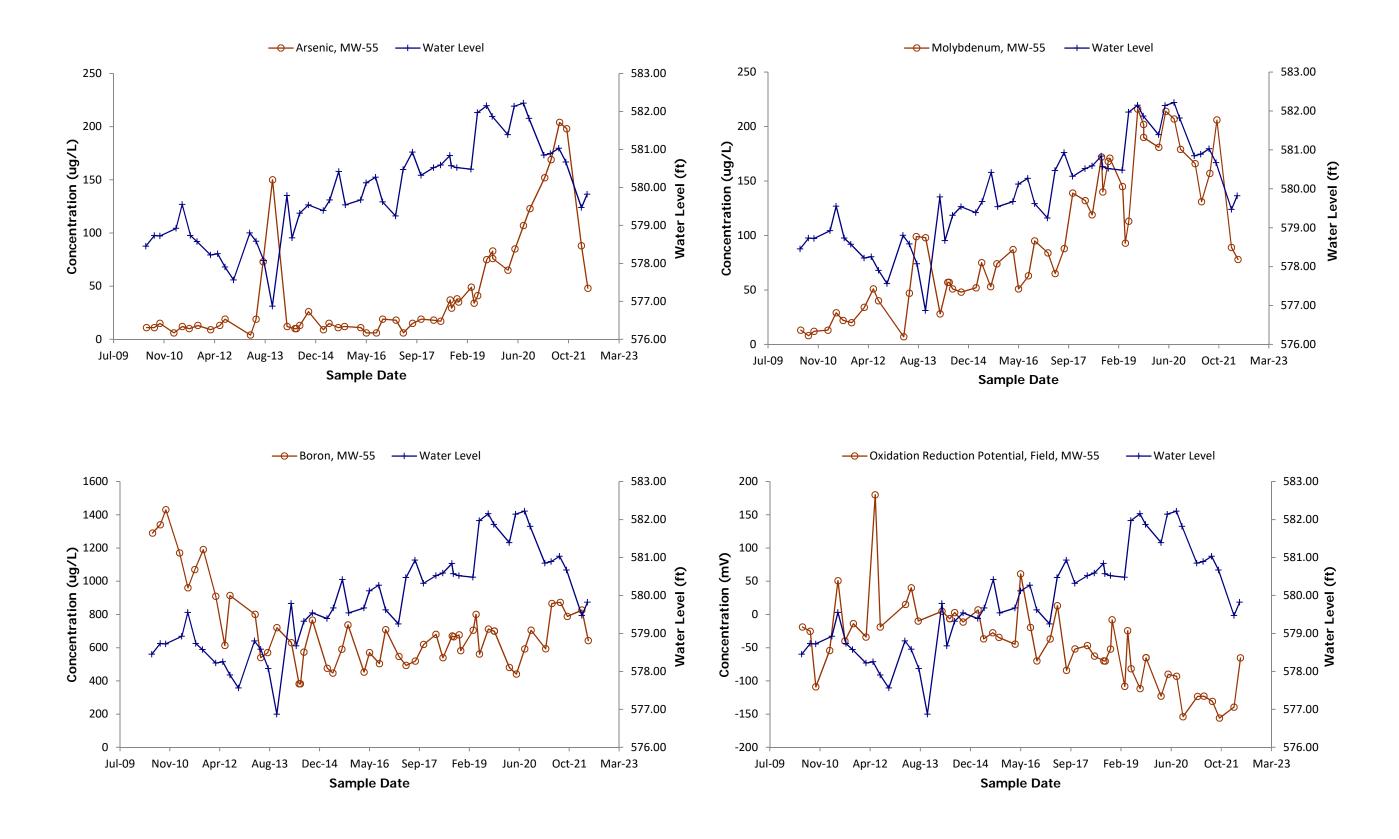
Table G2
Summary of Groundwater Sampling Results Near MW-55
JC Weadock Landfill – Hydrogeological Monitoring Program
Essexville, Michigan

Constituent		Arsenic	Boron	Molybdenum	Oxidation Reduction Potential, Field	
Unit		ug/L	ug/L	ug/L	mV	
Outside Slurry Wall						
MW-55	8/3/2021	204	873	157	-131.0	
	10/12/2021	198	788	206	-156.0	
	3/7/2022	88	826	89	-139.5	
	5/10/2022	48	642	78	-65.5	
Inside Slurry Wall						
OW-55	8/3/2021	15	1,890	< 5	-82.1	
	10/12/2021	10	2,300	< 5	-147.0	
	3/7/2022	6	2,090	< 5	-120.5	
	5/10/2022	14	2,050	< 5	-85.0	
JCW-OW-18004	8/3/2021	1	801	< 5	148.3	
	10/12/2021	1	857	< 5	-20.0	
	3/7/2022	1	705	< 5	-65.8	
	5/10/2022	< 1	815	< 5	213.0	
LH-104	5/11/2021	29	12,200	59	39.9	
	8/3/2021	21	9,410	10	-27.8	
	10/7/2021	26	11,200	40	-119.6	

#### Notes:

ug/L - micrograms per liter; mV - millivolts

Figure G2: Time Series Plots for MW-55 ASD





**Date:** July 27, 2022

**To:** J.R. Register, Consumers Energy

From: Darby Litz, TRC

Project No.: 464096.0000.0000 Phase 2 Task 2, 464096.0001.0000 Phase 2 Task 2

**Subject:** First Semiannual 2022 Nature and Extent Data Summary, JC Weadock, Consumers

Energy, Essexville, Michigan

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 or more downgradient monitoring well(s) at statistically significant levels exceeding the Groundwater Protection Standards (GWPSs) at the Weadock Landfill and beryllium and lithium were present in one or more downgradient monitoring well(s) at statistically significant levels exceeding the GWPSs at the Weadock Bottom Ash Pond<sup>2</sup>.

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)<sup>3</sup> 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 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.

<sup>&</sup>lt;sup>1</sup> TRC. 2019. Statistical Evaluation of Initial Assessment Monitoring Sampling Event, JC Weadock Landfill, Consumers Energy Company, Essexville, Michigan. January 14.

<sup>&</sup>lt;sup>2</sup> TRC. 2019. Statistical Evaluation of Initial Assessment Monitoring Sampling Event, JC Weadock Bottom Ash Pond, Consumers Energy Company, Essexville, Michigan. January 14.

<sup>&</sup>lt;sup>3</sup> TRC. 2019. Assessment of Corrective Measures – JC Weadock Bottom Ash Pond and Landfill Coal Combustion Residual Units. Prepared for Consumers Energy Company. September.

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.

As discussed in the ACM, the nature and extent of contamination (e.g. 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 exceed 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 distribution of arsenic and beryllium relative to the Weadock Landfill and Weadock Bottom Ash Pond in the shallow water-bearing unit as compared to the GWPS is presented in Figure 1. Lithium was previously present at statistically significant levels above the GWPS; however, concentrations have decreased such that in the first semiannual event of 2022, lithium was no longer present in groundwater above the GWPS. Three categories were assigned to groundwater data collected from November 2018 to May 2022, as follows:

- White No Exceedances: all concentrations were below the GWPS
- Yellow Two or More Exceedances: individual observations above the GWPS<sup>4</sup>
- Orange Statistically Significant GWPS Exceedances<sup>5</sup>

2

<sup>&</sup>lt;sup>4</sup> Although an exceedance is defined as a single detection above the GWPS, confidence intervals will be used to determine compliance per the CCR Rule. Compliance with the GWPSs established under § 257.95(h) will be achieved by demonstrating that concentrations of constituents listed in Appendix IV to this part have not exceeded the GWPSs for a period of three consecutive years using the statistical procedures and performance standards in § 257.93(f) and (g)

<sup>&</sup>lt;sup>5</sup> Lower confidence limit is above the GWPS based upon most recent assessment monitoring statistical evaluation.

As shown on Figure 1, the following is a summary of the RCRA Appendix IV nature and extent evaluation<sup>6</sup> organized by constituent:

#### Arsenic

Although the lower confidence limits of arsenic did not exceed the GWPS of 21 ug/L at the Weadock Bottom Ash Pond during the statistical evaluation of the May 2022 semiannual data, the observed upper confidence limit is above the GWPS at one well near the Weadock Bottom Ash Pond (JCW-MW-15007). During the statistical evaluation of the April 2018 through May 2020 semiannual events, monitoring well JCW-MW-15010 also exhibited an upper confidence limit at or above the GWPS for arsenic; however, since sluicing to the Weadock Bottom Ash Pond ceased in April 2016, concentrations of arsenic in JCW-MW-15010 appear to exhibit a downward trend and the arsenic concentrations at JCW-MW-15010 were below the GWPS from April 2018 to May 2021 and in May 2022, and the upper confidence limit in May 2022 remained below the GWPS. The influence of the source removal combined with changes in redox geochemistry impacted by the cessation of sluice water loading to the Weadock Bottom Ash Pond is still being evaluated as additional data collection events are completed.

Additionally, arsenic concentrations have at times exceeded the GWPS in three groundwater monitoring wells located along the Weadock Landfill perimeter (MW-53R, MW-55, and JCW-MW-18006). 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)<sup>7</sup>. The basis for this ASD is summarized below and updated time series plots in support of this ASD are included in the 2022 Semiannual Groundwater Monitoring Report and Second Quarter 2022 Hydrogeological Monitoring Report (22Q2 HMP Report)<sup>8</sup>.

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 Report. Additionally, Table G2 of the 22Q2 HMP Report shows concentrations of arsenic, boron, and molybdenum within the landfill (OW-55, JCW-OW-18004 and LH-104) are noticeably different than arsenic and molybdenum concentrations observed in MW-55. Arsenic and molybdenum concentrations are generally much lower inside the slurry wall and boron concentrations are much higher.

<sup>&</sup>lt;sup>6</sup> Comparison and discussion based on constituents that triggered corrective measures under the RCRA CCR program.

<sup>&</sup>lt;sup>7</sup>TRC. 2020. 2019 Annual Groundwater Monitoring Report – JC Weadock Power Plant Landfill CCR Unit. Prepared for Consumers Energy Company. January.

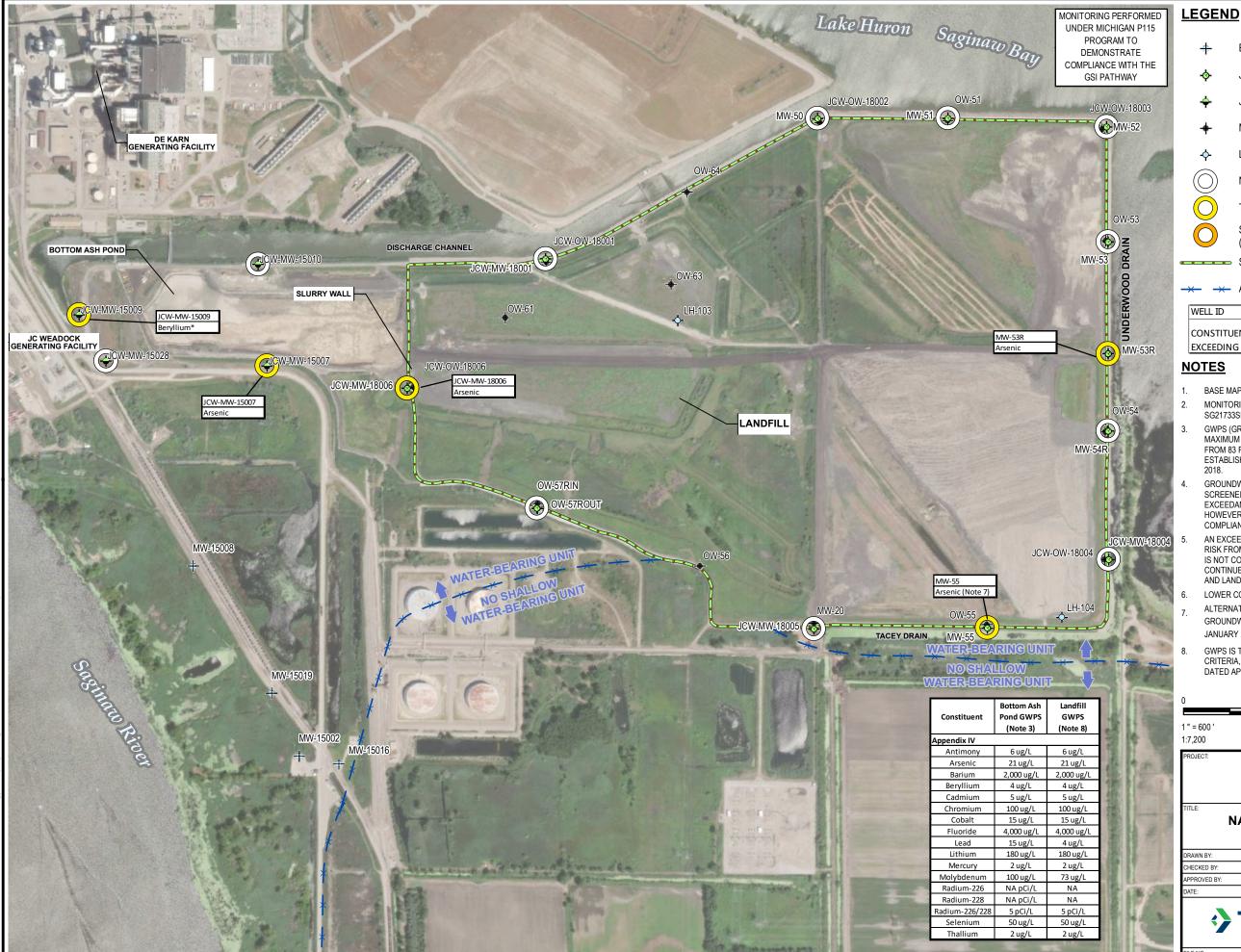
<sup>&</sup>lt;sup>8</sup> TRC. 2022. 2022 Semiannual Groundwater Monitoring Report and Second Quarter 2022 Hydrogeological Monitoring Report – JC Weadock Solid Waste Disposal Area. July.

- Conservative Tracer Boron is a metalloid known to be present in coal ash and can be used as a conservative tracer in groundwater to indicate whether elevated concentrations of constituents (i.e. arsenic) are consistent with coal ash. Concentrations of boron in Leachate Headwell LH-104 are significantly higher than concentrations observed at any of the other location sampled as a part of this ASD. Additionally, boron concentrations at MW-55 have decreased since 2010, as evidenced by the time series plots in Appendix G of the 22Q2 HMP Report. A downward trend in concentration for boron is strong evidence 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 for MW-55, as shown in Appendix G of the 22Q2 HMP Report are trending upwards and have increased over 4-ft since 2010. The oxidation-reduction potential (ORP) at MW-55 is generally lower (i.e., more reducing) than other wells along the southern and eastern portion of the landfill perimeter. 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 an increased solubility of arsenic and molybdenum.

#### Beryllium and Lithium

Beryllium and lithium were present at statistically significant levels above their respective GWPSs at JCW-MW-15009 at the Weadock Bottom Ash Pond when the groundwater monitoring program started in December 2015. Since sluicing to the Weadock Bottom Ash Pond ceased in April 2016, concentrations of beryllium and lithium appear to exhibit a downward trend. The influence of the bottom ash sluice water loading or changes in redox geochemistry impacted by the cessation of sluice water loading to the Weadock Bottom Ash Pond is still being evaluated as additional data collection events are completed after the source removal activity was completed and certified in August 2020. Lithium and beryllium concentrations have remained below the GWPS at other monitoring wells in the groundwater monitoring system and beryllium and lithium concentrations in JCW-MW-15009 have been below the GWPS for the past five and seven semiannual sampling events, respectively.

# **Figure**



- BACKGROUND MONITORING WELL
- JCW LANDFILL MONITORING WELL
- JCW BOTTOM ASH POND MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- LEACHATE HEADWELL
- NO EXCEEDANCES
- TWO OR MORE EXCEEDANCES (NOTES 4 & 5)
  - STATISCTICALLY SIGNIFICANT GWPS EXCEEDANCE
- (NOTE 6)

SLURRY WALL (APPROXIMATE)

→ APPROXIMATE WATER-BEARING UNIT BOUNDARY

CONSTITUENT(S) EXCEEDING GWPS

\* GWPS EXCEEDANCE TRIGGERING ASSESSMENT OF CORRECTIVE MEASURES PURSUANT TO §257.96

- BASE MAP IMAGERY FROM ESRI WORLD IMAGERY, 2020.
- MONITORING WELL AND SLURRY WALL LOCATIONS PROVIDED BY CEC; SG21733SHT2 REVB.DWG DATED 11/21/2018
- GWPS (GROUNDWATER PROTECTION STANDARD) IS THE HIGHER OF THE MAXIMUM CONTAMINANT LEVEL (MCL)/REGIONAL SCREENING LEVEL FROM 83 FR 36435 (RSL) AND UPPER TOLERANCE LIMIT (UTL) AS ESTABLISHED IN TRC'S TECHNICAL MEMORANDUM DATED OCTOBER 15,
- GROUNDWATER DATA FROM NOVEMBER 2018 TO MAY 2022 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.
- 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 BOTTOM ASH POND AND LANDFILL REMEDY SELECTION.
- LOWER CONFIDENCE LIMIT IS ABOVE GWPS.
- ALTERNATE SOURCE DEMONSTRATION INCLUDED IN 2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT (TRC,
- 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.



**CONSUMERS ENERGY COMPANY** JC WEADOCK POWER PLANT **ESSEXVILLE, MICHIGAN** 

#### **NATURE AND EXTENT SUMMARY GWPS EXCEEDANCES**

DRAWN BY:	A. FOJTIK	PROJ. NO.: 418426
CHECKED BY:	K. LOWERY	
APPROVED BY:	D. LITZ	FIGURE 1
DATE:	JULY 2022	



708 Heartland Trail, Suite 3000 Madison, WI 5371 Phone: 608.826.3600

418426-ExceedancesNE\_GWPS\_062022.mxd