2022 Annual Groundwater Monitoring and Corrective Action Report

Former JR Whiting Power Plant
Pond 1&2 and Pond 6

Erie, Michigan

January 2023

Prepared For:

Consumers Energy

Prepared By:

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1.0 Program Summary

Coal Combustion Residuals (CCR) are regulated under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule) (USEPA, April 2015, as amended). Standards for groundwater monitoring and corrective action codified in the CCR Rule (40 CFR 257.90-98), apply to the Consumers Energy Company (Consumers Energy) Pond 1&2 and Pond 6 at the former JR Whiting (JRW) Power Plant Site. Pursuant to the CCR Rule, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e). On behalf of Consumers Energy, TRC has prepared this Annual Groundwater Monitoring Report for JRW Pond 1&2 and Pond 6 to cover the period of January 1, 2022 to December 31, 2022. The reporting schedules for Pond 1&2 and Pond 6 have been aligned to be due no later than January 31 of each year.

This 2022 Pond 1&2 and Pond 6 Annual Report was prepared in accordance with the requirements of §257.90(e) and presents the monitoring results and the statistical evaluation of the detection monitoring constituents (Appendix III to Part 257 of the CCR Rule) for the April and October 2022 semiannual groundwater monitoring events for Pond 1&2 and Pond 6. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify statistically significant increases (SSIs) in detection monitoring constituents to determine if concentrations in detection monitoring well samples exceed background levels.

No SSIs over background limits attributable to Pond 1&2 or Pond 6 were identified for any of the Appendix III constituents during the 2022 monitoring events. Pond 1&2 and Pond 6 remained in detection monitoring through the period covered by this report. As such, Consumers Energy will continue with the detection monitoring program at the JRW Pond 1&2 and Pond 6 in conformance with §257.90 - §257.94.

2.0 Groundwater Monitoring

The 2022 semiannual monitoring events were completed in April and October 2022 to comply with both the CCR Rule and the Michigan Department of Environment, Great Lakes, and Energy (EGLE)-approved monitoring program established for Pond 1&2 and Pond 6 in early 2020. Given the congruencies between the two programs, data collected and evaluated under both programs are presented together in two semiannual reports to document the 2022 monitoring activities.

No monitoring wells were installed or decommissioned in 2022. Key actions in 2022 included performing detection monitoring for Pond 1&2 and Pond 6, conducting verification sampling during the first semiannual monitoring event, and an alternate source demonstration in July 2022 that attributes boron concentrations to natural variability in groundwater at two monitoring locations. No problems were encountered and thus no actions were needed to resolve problems. Key activities projected for 2023 include semi-annual detection monitoring,

2.1 First Semiannual Monitoring Event

A summary of the first semiannual groundwater monitoring event is provided in Appendix A.

2.2 Second Semiannual Monitoring Event

A summary of the second semiannual groundwater monitoring event is provided in Appendix B.

3.0 Corrective Action

There were no corrective actions needed or performed for either Pond 1&2 or Pond 6 within the calendar year 2022. No SSIs were recorded for the 2022 monitoring period that were attributable to either Pond 1&2 or Pond 6; therefore, Consumers Energy will continue with the detection monitoring program at the JRW Pond 1&2 and Pond 6 CCR unit in conformance with §257.90 - §257.94.

Appendix A
First Semiannual Monitoring Report

July 28, 2022

Brett Coulter, CPG, District Geologist
EGLE, Materials Management Division
State Office Building
301 East Louis Glick Highway
Jackson, MI 49201

TRANSMITTAL OF GROUNDWATER MONITORING RESULTS FOR JR WHITING SOLID WASTE DISPOSAL AREA

Dear Mr. Coulter,

Please find attached the First Semiannual 2022 Groundwater Monitoring Report for the JR Whiting Solid Waste Disposal Area, Facility ID 397664, prepared pursuant to the May 2020 Hydrogeological Monitoring Plan.

JR Whiting was following the groundwater monitoring waiver approved on September 2, 2009 until the federal Resource Conservation and Recovery Act (RCRA) coal combustion residuals (CCR) rule required groundwater monitoring at JR Whiting Pond 1&2 and then at Pond 6, beginning around 2016. Since then, in December 2018, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Project Act, also known as Part 115 of PA 451 of 1994, as amended, to incorporate requirements of the federal CCR Rule. In 2019, Consumers Energy submitted a revised JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Plant, Erie, Michigan (2020 HMP) (TRC, May 2020 Revision) that was finalized and approved by the Michigan Department of Environment, Great Lakes, and Energy in May 2020. The revised HMP harmonizes both the CCR Rule and state of Michigan requirements. This submittal was prepared in accordance with the July 5, 2013 OWMRP-115-29 communication under the revised HMP.

Please contact me if you have any questions regarding this transmittal.

Sincerely,

Michelle A. Marion
Sr. Engineer, Consumers Energy Environmental Services
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Email: michelle.marion@cmsenergy.com

cc Larry Bean, EGLE (via email)
Gary Schwerin, EGLE (via email)

First Semiannual 2022 Groundwater Monitoring Report

Former JR Whiting Power Plant Pond 1&2 and Pond 6

Erie, Michigan

July 2022

Prepared For:

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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 257.90-98) apply to the Consumers Energy Company (Consumers Energy) Ponds 1 and 2 (closed surface impoundment monitored as Pond 1&2 using a multiunit groundwater monitoring system) and Pond 6 (closed inactive surface impoundment) at the former JR Whiting (JRW) Power Plant Site (the Site). Prior to the CCR Rule, from about 2009 to 2016, JR Whiting followed the approved groundwater monitoring waiver.

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. On August 8, 2019 Consumers Energy submitted a revised *JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Power Plant, Erie, Michigan* (2020 HMP) (TRC, May 2020 Revision) to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to comply with the requirements of Part 115, Rule 299.4905, and the CCR Rule. The HMP was approved by the EGLE on May 11, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This JR Whiting First Semiannual 2022 Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to present groundwater monitoring data collected from the JR Whiting Pond 1&2 and Pond 6 during the second calendar quarter of 2022. This report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the July 5, 2013 Michigan Department of Environmental Quality - Office of Waste Management and Radiological Protection (MDEQ-OWMRP), 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 Monitoring Submittals. All references herein to the EGLE are inclusive of the MDEQ. Groundwater sampling, analysis, and information contained in this report was prepared in adherence to the 2020 HMP.

1.2 Program Summary

Historically groundwater monitoring at JRW was performed under the HMP last revised on November 26, 1997 until the groundwater monitoring waiver was approved on September 2, 2009. It was then performed pursuant to the CCR Rule until implementation of the 2020 HMP. In the *First Semiannual 2021 Groundwater Monitoring Report* for the JRW Pond 1&2 and Pond 6 (First Semiannual 2021 Report) (TRC, July 2021), Consumers Energy reported that no potential statistically significant increases (SSIs) were noted during the second 2021 semiannual detection monitoring event. Therefore, Consumers Energy continued detection monitoring in the first half of 2022 at Pond 1&2 and Pond 6 pursuant to §257.94 of the CCR

Rule, and the HMP.

This First Semiannual 2022 Report presents the monitoring results and the statistical evaluation of the detection monitoring constituents (Section 11511a(3)(c) of Part 115) for the April 2022 semiannual groundwater monitoring event for Pond 1&2 and Pond 6. Detection monitoring was performed in accordance with the 2020 HMP. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify SSIs of detection monitoring constituents compared to background levels.

1.3 Site Overview

The JR Whiting Plant was a coal-fired power generation facility located in Erie, Michigan, on the western shore of Lake Erie (Figure 1). The plant began producing electricity in 1952 from Units 1 and 2, with Unit 3 beginning operation in 1953. The plant ceased operation in April 2016. Figure 1 is the site location map showing the facility and the surrounding area. Site features are shown on Figure 2.

The JR Whiting Ash Disposal Area is licensed under Michigan Part 115 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended.

Pond 1&2 is located to the east of the plant, north of the discharge canal, south of Erie Road, and west of Lake Erie and constructed in native clay soil. It was historically used for wet ash sluicing. In 2019, it received its final cover system constructed pursuant to 40 CFR 257.102(a); the Pond 1&2 Closure Construction Quality Assurance (CQA) Plan dated August 31, 2017; the Part 115 Administrative Rules; and Pond 1&2 Closure Plan submitted to the EGLE on December 18, 2017. The closure of Pond 1&2 was certified by the EGLE in a letter dated August 27, 2020.

Pond 6 is located to the north of the plant and was constructed in native clay soil. It was an inactive surface impoundment at the time the CCR Rule became effective on October 19, 2015 and was capped with final cover certified pursuant to the CCR Rule on December 5, 2017 and certified by the EGLE on August 24, 2018.

1.4 Geology/Hydrogeology

Pond 1&2 and Pond 6 are located adjacent to Lake Erie. The subsurface materials encountered at the JR Whiting site are predominately clay-rich till. The surficial CCR fill material is underlain by approximately 40 to 50 feet of laterally extensive clay-rich till that acts as a natural hydraulic barrier across the site. Limestone bedrock is present beneath the till and is considered the uppermost aquifer at the site.

Groundwater present within the uppermost aquifer is typically encountered at Pond 1&2 and Pond 6 around 70 to 80 feet below ground surface (ft bgs), approximately 510 to 520 feet above mean sea level (AMSL), in the limestone (beneath the till). The uppermost aquifer is confined and protected from CCR constituents by the 40 to 50 foot-thick overlying clay-rich aquitard which interfaces with the limestone at the elevation range of 510 to 520 ft. Potentiometric surface elevation data from groundwater within the CCR monitoring wells represents the levels

in which groundwater rises under hydrostatic pressure within each well and exhibit an extremely low hydraulic gradient across the site with no consistent or discernible flow direction.

2.0 Groundwater Monitoring

2.1 Monitoring Well Network

A groundwater monitoring system has been established for Pond 1&2 and Pond 6, which established the monitoring well locations for detection monitoring. The detection monitoring well network for Pond 1&2 and Pond 6 currently consists of six monitoring wells for each CCR unit that are screened in the uppermost aquifer. Monitoring well locations are shown on Figure 2.

As discussed in the HMP, intrawell statistical methods for JR Whiting were selected based on the geology and hydrogeology at the Site (primarily the presence of clay/hydraulic barrier, no apparent flow direction and lack of flow potential across the aquifer), in addition to other supporting lines of evidence that the aquifer is unaffected by the CCR unit (such as the consistency in concentrations of water quality data and similarities in concentrations in background and downgradient wells).

An intrawell statistical approach requires that each of the downgradient wells doubles as the background and compliance well, where data from each individual well during a detection monitoring event is compared to a statistical limit developed using the background dataset from that same well. Monitoring wells JRW-MW-15001 through JRW-MW-15006 are located around the perimeter of Pond 1&2 and monitoring wells JRW-MW-16001 through JRW-MW-16006 are located around the perimeter of the JRW Pond 6. These monitoring wells provide data on both background and downgradient groundwater quality that has not been affected by the CCR unit (a total of six background/downgradient monitoring wells for each pond).

As shown on Figure 2, monitoring wells JRW-MW-16007 through JRW-MW-16009 are used for water level measurements only. These wells were initially installed as potential background monitoring wells during the initial stages of characterizing the site. However, based on further hydrogeological characterization of the uppermost aquifer, an intrawell statistical approach was selected which does not rely on JRW-MW-16007 through JRW-MW-16009 for statistical evaluation.

No monitoring wells have been installed or decommissioned since the previous monitoring event.

2.2 April 2022 Groundwater Monitoring

Consumers Energy Laboratory Services personnel performed gauging and sampling of monitoring wells associated with Pond 1&2 and Pond 6 on April 6, 2022. Groundwater monitoring was performed in accordance with the HMP. Groundwater samples collected during the April 2022 event were submitted to Consumers Energy Laboratory Services in Jackson, Michigan, for analysis of the following metals and inorganic indicator constituents:

Section 11511a(3)(c) – Detection Monitoring Constituents
Boron
Calcium
Chloride
Fluoride
Iron
pH
Sulfate
Total Dissolved Solids (TDS)

Static water level measurements were collected at all locations after equilibration to atmospheric pressure. The depth to water was measured according to ASTM D 4750, "Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well" and recorded to the nearest 0.01 foot. Static water elevation data are summarized in Table 1.

Groundwater samples were collected using a peristaltic pump or submersible pump in accordance with low flow sampling protocol and were not field filtered to allow for total metals analysis. Groundwater field parameters included dissolved oxygen, oxidation reduction potential, specific conductivity, temperature, and turbidity and are summarized on Table 2. All samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Consumers Energy followed chain of custody procedures to document the sample handling.

Consumers Energy collected quality assurance/quality control (QA/QC) samples from both CCR units, Pond 1&2 and Pond 6, during the April 2022 groundwater sampling event. The QA/QC samples per CCR unit consisted of one field blank, one equipment blank, one field duplicate (JRW-MW-15005 at Pond 1&2 and JHC-MW-16004 at Pond 6), and one field matrix spike/matrix spike duplicate (MS/MSD) sample collected from JRW-MW-15001 at Pond 1&2, and JHC-MW-16003 at Pond 6.

Groundwater analytical results from the first semiannual 2022 monitoring event are summarized in Table 3 (Pond 1&2) and Table 4 (Pond 6). The laboratory analytical reports are included in Appendix B. Field records are included in Appendix C.

2.2.1 Data Quality Review

Data from each round 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 CCR monitoring program. Data quality reviews are summarized in Appendix A.

2.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the background sampling events showed that the hydraulic gradient for groundwater within the uppermost aquifer is often so low, groundwater flow across Pond 1&2 and Pond 6 is frequently incalculable and often stagnant.

There are minor differences in hydraulic head across the monitoring wells (ranging from zero up to 0.15 feet across Pond 1&2 and up to 0.24 feet across Pond 6 from event to event from November 2016 through April 2022), indicating that the potentiometric surface is flat the majority of the time. In the few instances since November 2016 where a slight gradient was observed and calculable, the direction of the flow potential is highly variable event to event and has shown flow directions slightly to the northwest, east, and northeast from Pond 1&2 and slightly to the south, west, and northeast from Pond 6.

The most pronounced groundwater gradient between November 2016 and April 2022 at Pond 1&2 was observed on December 19, 2016, which showed a slight horizontal gradient of approximately 0.00016 to the northwest across Pond 1&2. For Pond 6, the most pronounced potentiometric head differential of 0.24 feet was observed on February 28, 2018 between JRW-MW-16001 on the north edge of Pond 6 and JRW-MW-16004 on the south edge of the Pond 6 CCR unit. Although, when considering the potentiometric surface elevation data from all of the Pond 6 CCR unit wells, the general groundwater flow direction inferred across the pond at that time is to the southwest, in order to be conservative, the maximum head difference was used to calculate the maximum groundwater flow velocity at the Pond 6 CCR unit throughout the background monitoring period. This results in a very slight horizontal gradient of approximately 0.000099 ft/ft to the south.

Pond 1&2

Although there was no clear flow direction when looking at water levels across the Pond 1&2 well network, the maximum groundwater gradient inferred on April 6, 2022 was calculated using well pair JRW-MW-15003/JRW-MW-15002. The head difference across Pond 1&2 ranged from 0.01 to 0.07 feet between monitoring wells, with the maximum head difference showing a slight horizontal gradient of approximately 0.00014 ft/ft. Using the highest hydraulic conductivity measured at the Pond 1&2 monitoring wells of 20 feet/day (ARCADIS, 2016), and an assumed effective porosity of 0.1, this results in a maximum inferred groundwater flow rate of approximately 0.027 feet/day (approximately 10 feet/year). However, the actual gradient is much lower when considering the rest of the monitoring wells across Pond 1&2 and the lack of discernable flow direction. The Pond 1&2 groundwater potentiometric surface elevations measured across the Site during the April 2022 sampling event are provided on Table 1 and are summarized in plan view on Figure 3.

The extremely low gradient and lack of general flow direction is similar to that identified in previous monitoring rounds (since the background sampling events commenced in December 2016) and continues to demonstrate that the downgradient compliance wells are appropriately positioned to detect the presence of detection monitoring constituents that could potentially migrate from Pond 1&2.

Pond 6

Although there was no clear flow direction when looking at water levels across the Pond 6 well network, the maximum groundwater gradient inferred on April 6, 2022 was calculated using well pair JRW-MW-16003/JRW-MW-16002. The head difference across Pond 6 ranged from 0.01 to 0.07 feet between monitoring wells, with the maximum head difference showing a slight horizontal gradient of approximately 0.000090 ft/ft. Using the highest hydraulic conductivity measured at the Pond 6 CCR unit monitoring wells (11.9 feet/day from the 2016 TRC well installation report) and an assumed effective porosity of 0.1, this results in a maximum inferred groundwater flow rate of approximately 0.011 feet/day (approximately 3.9 feet/year). Groundwater potentiometric surface elevations measured across the Site during the April 2022 sampling event are provided on Table 1 and are summarized in plan view on Figure 3.

The extremely low gradient and/or lack of a consistent or discernable general flow direction is similar to that identified in previous monitoring rounds since the background sampling events commenced in November 2016 and continues to demonstrate that the downgradient compliance wells are appropriately positioned to detect the presence of detection monitoring constituents that could potentially migrate from the JRW Pond 6.

3.0 Statistical Evaluation

Detection monitoring is continuing at JR Whiting Pond 1&2 and Pond 6 in accordance with the HMP. The following section summarizes the statistical approach applied to assess the first semiannual 2022 groundwater data in accordance with the detection monitoring program.

3.1 Establishing Background Limits

Pond 1&2

Per the HMP, background limits were established for the detection monitoring constituents using data collected from each of the six established detection monitoring wells (JRW-MW-15001 through JRW-MW-15006). The background limits for each monitoring well have been calculated using thirteen rounds of data collected from November 2016 through March 2019 as presented in detail in the 2019 Annual Report. These background limits will continue to be used throughout the detection monitoring program to determine whether groundwater has been impacted from Pond 1&2 by comparing concentrations in the detection monitoring wells to their respective background limits for each detection monitoring constituent, with the exception of iron. Iron was incorporated into the monitoring program as part of the 2020 HMP. Background limits for iron will be calculated once a minimum of eight background data points have been collected from each monitoring location.

Pond 6

Per the HMP, background limits were established for the detection monitoring constituents following the twelfth round of background monitoring using data collected from each of the six established detection monitoring wells (JRW-MW-16001 through JRW-MW-16006). The statistical evaluation of the background data is presented in the Pond 6 July 2019 Annual Report. The detection monitoring background limits for each monitoring well will be used throughout the detection monitoring period to determine whether groundwater has been impacted from Pond 6 by comparing concentrations in the detection monitoring wells to their respective background limits for each detection monitoring constituent, with the exception of iron. Iron was incorporated into to the monitoring program as part of the 2020 HMP. Background limits for iron will be calculated once a minimum of eight background data points have been collected from each monitoring location.

3.2 Data Comparison to Background Limits – Pond 1&2 First 2022 Semiannual Event (April 2022)

The concentrations of the constituents in each of the detection monitoring wells (JRW-MW-15001 through JRW-MW-15006) were compared to their respective statistical background limits calculated from the background data collected from each individual well (i.e., monitoring data from JRW-MW-15001 is compared to the background limit developed using the background dataset from JRW-MW-15001, and so forth). The comparisons are presented on Table 3.

Based on the statistical evaluation of the April 2022 detection monitoring parameters, a resample for the following parameters were collected in accordance with the HMP:

- Boron at JRW-MW-15002 and JRW-MW-15003; and
- Calcium at JRW-MW-15005.

The initial observation of a constituent concentration above the established background limits does not necessarily constitute an SSI. Per the Stats Plan, if there is an exceedance of a prediction limit for one or more of the constituents, the well(s) of concern can be resampled within 30 days of the completion of the initial statistical analysis for verification purposes. There were no SSIs compared to background for chloride, fluoride, sulfate, or TDS.

3.3 Verification Resampling for the First 2022 Semiannual Event

Verification resampling is performed per the HMP (Stats Plan) and the USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance (Unified Guidance, USEPA, 2009) to achieve performance standards as specified by Part 115 Rule 299.4908 and §257.93(g) in the CCR Rule. Per the Stats Plan, if there is an exceedance of a prediction limit for one or more of the parameters, the well(s) of concern will be resampled within 30 days of the completion of the initial statistical analysis. Only constituents that initially exceed their statistical limit (i.e., have no previously recorded SSIs) will be analyzed for verification purposes.

Verification samples were collected on May 20, 2022 by Consumers Energy Trail Street personnel for boron analysis at monitoring well JRW-MW-15002 and JRW-MW-15003, and for calcium analysis at monitoring well JRW-MW-15005 in accordance with the HMP. A summary of the groundwater analytical data collected during the verification resampling event is provided on Table 2 (field data) and Table 3 (analytical data compared to background). The associated data quality review is included in Appendix A.

The JRW-MW-15005 calcium verification result is within the prediction limits; therefore, no SSI exists from the April 2022 event for calcium in accordance with the HMP and the Unified Guidance.

The May 2022 verification sampling confirmed the SSI slightly above the prediction limit for boron at monitoring wells JRW-MW-15002 and JRW-MW-15003. Therefore, in accordance with the HMP and the Unified Guidance, if the verification sample remains statistically significant, then statistical significance will be considered, and, per the HMP, the 14-day notification will be made. This report serves as the 14-day notification for the SSI that occurred for boron at monitoring wells JRW-MW-15002 and JRW-MW-15003. If an SSI over background levels for one or more of the detection monitoring parameters is determined, a 30-day demonstration period will be initiated upon determining the increase to identify if the apparent increase was attributable to an error in sampling, analysis, statistical evaluation, impact from an off-site source, or natural variability in groundwater quality in accordance with Rule 299.4440(9). .

In response to the potential SSI for boron, an Alternate Source Demonstration (ASD) is also included in this report for EGLE approval. The ASD was prepared by TRC in the form of a technical memorandum dated July 28, 2022 with the subject: *Alternate Source Demonstration: April 2022 Detection Monitoring Event* (April 2022 ASD) to evaluate the SSI and demonstrate

that the SSI is attributable to natural variation within the uppermost aquifer that has not yet been captured in the background data set. The April 2022 ASD is attached as Appendix D. Based on the multiple lines of evidence presented in the ASD, the SSI observed at JRW-MW-15002 and JRW-MW-15003 cannot be attributed to Pond 1&2.

As no SSIs were found attributable to Pond 1&2, detection monitoring will be continued at the in accordance with the HMP. Per the EGLE prescribed submittal format, a statistical exceedances summary is included as Table 5 and reflects the results of the first 2022 semiannual monitoring event.

3.4 Data Comparison to Background Limits – Pond 6 First 2022 Semiannual Event (April 2022)

The data comparisons of monitoring wells JRW-MW-16001 through JRW-MW-16006 for the April 2022 groundwater monitoring event are presented on Table 4.

There were no SSIs compared to background for any of the constituents. As no SSIs were found, detection monitoring will be continued at the Pond 6 CCR unit in accordance with the HMP. Per the EGLE prescribed submittal format, a statistical exceedances summary is included as Table 5 and reflects that no statistical exceedances have occurred for the first 2022 semiannual monitoring event.

4.0 Conclusions and Recommendations

As no SSIs were found attributable to Pond 1&2 or Pond 6 during the April 2022 monitoring event, Consumers Energy will continue with the detection monitoring program in conformance with the HMP. No corrective actions were needed or performed for either Pond 1&2 or Pond 6. The next semiannual monitoring event at the JR Whiting Pond 1&2 and Pond 6 CCR units is scheduled for the fourth calendar quarter of 2022.

5.0 References

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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.

Tables

Table 1

Potentiometric Groundwater Elevation Summary – April 2022

JR Whiting Pond 1 & 2 and Pond 6

Erie, Michigan

Well Location	Ground Surface Elevation (ft)	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Depth (ft BGS)			Screen Interval Elevation (ft)			April 6, 2022	
										Depth to Water (ft BTOC)	Potentiometric Groundwater Elevation (ft)
Static Water Level Monitoring Wells											
JRW-MW-16007	579.47	582.31	Limestone	68.0	to	78.0	511.5	to	501.5	5.23	577.09
JRW-MW-16008	579.95	582.83	Limestone	68.0	to	73.0	512.0	to	507.0	5.75	577.09
JRW-MW-16009	579.90	582.60	Limestone	69.0	to	79.0	510.9	to	500.9	5.51	577.08
Pond 1 & 2											
JRW-MW-15001(1)	590	581.39	Limestone	78.0	to	88.0	512.7	to	502.7	4.27	577.12
JRW-MW-15002(1)	590	590.17	Limestone	81.0	to	91.0	511.3	to	501.3	13.07	577.10
JRW-MW-15003(1)	590	587.23	Limestone	81.0	to	91.0	510.4	to	500.4	10.06	577.17
JRW-MW-15004(1)	590	589.32	Limestone	86.0	to	96.0	506.5	to	496.5	12.21	577.11
JRW-MW-15005(1)	590	588.28	Limestone	86.0	to	96.0	508.3	to	498.3	11.13	577.15
JRW-MW-15006(1)	590	580.48	Limestone	81.0	to	91.0	511.0	to	501.0	3.37	577.11
Pond 6											
JRW-MW-16001	589.19	592.33	Limestone	71.0	to	81.0	518.2	to	508.2	15.26	577.07
JRW-MW-16002	585.78	588.69	Limestone	81.0	to	91.0	504.8	to	494.8	11.66	577.03
JRW-MW-16003	586.19	589.01	Limestone	73.0	to	83.0	513.2	to	503.2	11.91	577.10
JRW-MW-16004	586.48	589.34	Limestone	75.0	to	85.0	511.5	to	501.5	12.25	577.09
JRW-MW-16005	589.29	592.14	Limestone	78.0	to	88.0	511.3	to	501.3	15.05	577.09
JRW-MW-16006	588.26	591.04	Limestone	79.0	to	89.0	509.3	to	499.26	13.95	577.09

Notes:

Top of casing elevation survey was conducted by Rowe Professional Services Company in September 2019.

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.

ft BGS: Feet below ground surface.

NM = Not measured

(1) Screen interval depth below ground surface for Pond 1&2 monitoring wells approximated using an estimated final capped ground surface elevation of 590 feet above mean sea level. Screen interval elevations were measured using the original survey conducted by Sheridan Surveying Co. November 2015 at the time of monitoring well installation.

Table 2
Summary of Field Parameter Results: April and May 2022
JR Whiting Pond 1 & 2 and Pond 6
Erie, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Pond 1 & 2							
JRW-MW-15001	4/6/2022	0.34	-134.8	7.5	1,101	11.5	5.49
JRW-MW-15002	4/6/2022	0.30	-165.7	7.6	1,130	11.6	3.91
	5/20/2022 (1)	0.30	-162.5	7.7	1,131	16.0	4.55
JRW-MW-15003	4/6/2022	0.38	-117.7	7.7	1,004	12.1	4.92
	5/20/2022 (1)	2.32	-79.9	7.7	1,004	16.5	4.96
JRW-MW-15004	4/6/2022	1.31	35.3	7.5	968	11.3	3.91
JRW-MW-15005	4/6/2022	2.60	41.2	7.6	888	12.5	5.96
	5/20/2022 (1)	2.39	98.2	7.7	893	16.4	4.61
JRW-MW-15006	4/6/2022	6.35	26.2	7.6	992	11.4	6.43
Pond 6							
JRW-MW-16001	4/6/2022	0.32	-130.8	8.0	757	11.7	2.67
JRW-MW-16002	4/6/2022	0.28	-136.4	7.9	982	11.2	2.72
JRW-MW-16003	4/6/2022	0.27	-127.5	7.7	991	11.6	2.37
JRW-MW-16004	4/6/2022	0.29	-126.9	7.7	1,144	11.8	2.21
JRW-MW-16005	4/6/2022	0.23	-170.1	7.7	841	12.2	0.80
JRW-MW-16006	4/6/2022	0.25	-175.5	7.6	811	11.7	3.43

Notes:
mg/L - Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit.
(1) Results shown for verification sampling performed on May 20, 2022.

Table 3
Comparison of Groundwater Monitoring Parameter Results to Background Limits – April and May 2022
JR Whiting Pond 1 & 2
Erie, Michigan

Sample Location:		JRW-MW-15001		JRW-MW-15002			JRW-MW-15003			JRW-MW-15004		JRW-MW-15005			JRW-MW-15006	
Sample Date:		4/6/2022	PL	4/6/2022	5/20/2022	PL	4/6/2022	5/20/2022	PL	4/6/2022	PL	4/6/2022	5/20/2022	PL	4/6/2022	PL
Constituent	Unit	Data		Data			Data			Data		Data			Data	
Appendix III																
Boron	ug/L	224	240	**235**	**224**	220	**251**	**232**	230	260	270	213	--	270	242	250
Calcium	mg/L	149	180	132	--	180	123	--	160	129	140	**122**	120	120	134	140
Chloride	mg/L	43.9	55	39.5	--	56	41.7	--	55	44.7	56	31.1	--	46	41.4	53
Fluoride	ug/L	< 1,000	1,600	< 1,000	--	1,900	< 1,000	--	1,800	< 1,000	1,800	< 1,000	--	1,700	< 1,000	1,700
pH, Field	su	7.5	6.8 - 8.2	7.6	--	7.2 - 7.9	7.7	--	7.3 - 8.3	7.5	7.0 - 8.0	7.6	--	7.3 - 8.6	7.6	7.0 - 9.0
Sulfate	mg/L	374	470	399	--	500	341	--	440	326	390	295	--	350	336	410
Total Dissolved Solids	mg/L	783	1,000	786	--	1,100	702	--	940	674	880	618	--	840	699	920
Part 115 Parameters																
Iron	ug/L	1,110	n<8	779	--	n<8	526	--	n<8	104	n<8	419	--	n<8	450	n<8

Notes:
ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
All metals were analyzed as total unless otherwise specified.
Bold font indicates an exceedance of the Prediction Limit (PL).
RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).

Table 4
Comparison of Groundwater Monitoring Parameter Results to Background Limits – April 2022
JR Whiting Pond 6
Erie, Michigan

Sample Location:		JRW-MW-16001		JRW-MW-16002		JRW-MW-16003		JRW-MW-16004		JRW-MW-16005		JRW-MW-16006	
Sample Date:		4/6/2022	PL	4/6/2022	PL	4/6/2022	PL	4/6/2022	PL	4/6/2022	PL	4/6/2022	PL
Constituent	Unit	Data		Data		Data		Data		Data		Data	
Appendix III													
Boron	ug/L	172	203	199	209	240	257	225	262	208	244	188	226
Calcium	mg/L	99	111	143	149	131	156	159	181	122	182	112	117
Chloride	mg/L	18.4	23.6	20.3	25.4	26.7	32.4	36.4	43.7	22.9	29.4	27.2	38.6
Fluoride	ug/L	< 1,000	2,300	< 1,000	1,400	< 1,000	1,600	< 1,000	1,700	< 1,000	1,800	< 1,000	2,200
pH, Field	su	8.0	7.5 - 8.9	7.9	7.5 - 8.3	7.7	7.4 - 7.9	7.7	7.4 - 8.2	7.7	7.0 - 8.0	7.6	7.5 - 8.2
Sulfate	mg/L	248	278	388	426	384	470	449	507	308	498	36.1	399
Total Dissolved Solids	mg/L	514	770	738	832	731	1,040	853	1,110	642	1,030	563	904
Part 115 Parameters													
Iron	ug/L	147	n<8	243	n<8	495	n<8	518	n<8	409	n<8	226	n<8

Notes:
ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
All metals were analyzed as total unless otherwise specified.
Bold font indicates an exceedance of the Prediction Limit (PL).

Table 5
Summary of Statistical Exceedances – April 2022
JR Whiting Pond 1 & 2 and Pond 6
Erie, Michigan

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

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

Facility: JR Whiting – WDS# 397664

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	2 Qtr. 2022 (**bold** >201)	4 Qtr. 2021 (**bold** >201)	2 Qtr. 2021 (**bold** >201)	4 Qtr. 2020 (**bold** >201)
JRW-MW-15002	JR Whiting Pond 1 & 2	Boron	500	220	224(1)	204	187	174
JRW-MW-15003	JR Whiting Pond 1 & 2	Boron	500	230	232(1)	216	203	191

NOTES:
(1) Second quarter 2022 prediction limit exceedances addressed through the Alternate Source Demonstration: April 2022 Detection Monitoring Event Former JR Whiting Power Plant Pond 1&2.

Figures

BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 3,000 6,000 FEET

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com
TRC - GIS

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	A. ADAIR
CHECKED BY:	B. YELEN
APPROVED BY:	S. HOLMSTROM
DATE:	JULY 2022
PROJ. NO.:	464089
FILE:	464089-001-001slm.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\464089-001-001slm.mxd -- Saved By: AADAIR on 6/7/2022, 15:05:07 PM

LEGEND

- MONITORING WELL (STATIC WATER LEVEL ONLY)
- CCR UNIT MONITORING WELL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 03/2021.
2. STATIC WATER ONLY WELL LOCATIONS SURVEYED BY SHERIDAN SURVEYING CO. ON 11/19/2015.
3. PONDS 1 & 2 WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 11/27 /2019.

N

0 500 1,000 Feet

1 " = 500 '

1:6,000

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE PLAN
WITH CCR MONITORING WELL LOCATIONS

DRAWN BY:	A. ADAIR	PROJ NO.:	464089
CHECKED BY:	B. YELEN		
APPROVED BY:	S. HOLMSTROM		**FIGURE 2**
DATE:	July 2022		

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FILE NO.: 464089-001-002_SP.mxd

Plot Date: 1/4/2023, 17:19:16 PM by MHORN -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\464089-001-002_SP.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

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LEGEND

- MONITORING WELL (STATIC WATER LEVEL ONLY)
- CCR UNIT MONITORING WELL

LABEL FORMAT

MONITORING WELL ID
GROUNDWATER ELEVATION FT (MEASUREMENT DATE)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 03/2021.
2. WELL LOCATIONS SURVEYED BY SHERIDAN SURVEYING CO. ON 11/19/2015.
3. PONDS 1 & 2 WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 11/27/2019.
4. MONITORING WELL TOP OF CASING SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 7/14/2020. VERTICAL DATUM IS NAVD88.

N

0 500 1,000 Feet

1 " = 500 '
1:6,000

PROJECT:
CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC ELEVATION SUMMARY APRIL 2022

DRAWN BY:	A. ADAIR	PROJ NO.:	464089
CHECKED BY:	B. YELEN		
APPROVED BY:	S. HOLMSTROM		**FIGURE 3**
DATE:	JULY 2022		

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FILE NO.: 464089-001-003_GWP.mxd

TRC - GIS
Plot Date: 6/7/2022, 15:40:10 PM by AADAIR -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\464089-001-003_GWP.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

Appendix A
Data Quality Reviews

Pond 1 & 2

Laboratory Data Quality Review
Groundwater Sampling Event April 2022
Consumers Energy JR Whiting Pond 1 & 2

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the April 2022 groundwater monitoring sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by CE Laboratory Services, located in Jackson, Michigan. The laboratory analytical results were reported in laboratory project number 22-0324.

During the April 2022 sampling event, a groundwater sample was collected from each of the following wells:

- JRW-MW-15001
- JRW-MW-15002
- JRW-MW-15003
- JRW-MW-15004
- JRW-MW-15005
- JRW-MW-15006

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

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

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

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund 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 equipment blanks and field blanks. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- 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 the laboratory. 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.

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.

Findings

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable, with the exceptions noted below. The discussion that follows describes the QA/QC results and evaluation.

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 constituents as well as iron will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.
- When the data are evaluated through a detection monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One equipment blank (EB-01) and one field blank (FB-01) were collected. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample JRW-MW-15006 for total metals and anions. 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 MS/MSD recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- The field duplicate pair samples were DUP-01/JRW-MW-15005. All criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The nondetect RL for TDS (10 mg/L) in samples EB-01 and FB-01 was above the RL specified in the Sampling and Analysis Plan (1.0 mg/L).

Laboratory Data Quality Review
Verification Groundwater Sampling Event May 2022
Consumers Energy JR Whiting Pond 1 & 2

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the May 2022 groundwater monitoring sampling event. Samples were analyzed for total metals by CE Laboratory Services, located in Jackson, Michigan. The laboratory analytical results were reported in laboratory project number 22-0530.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

- JRW-MW-15002
- JRW-MW-15003
- JRW-MW-15005

Each sample was analyzed for the following constituents:

Analyte Group	Method
Total Metals (Boron, Calcium, Iron)	SW-846 6020B

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

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund 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 the laboratory. 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 total metals.

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.

Findings

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable, with the exceptions noted below. The discussion that follows describes the QA/QC results and evaluation.

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 constituents as well as iron will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.
- When the data are evaluated through a detection monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One equipment blank (EB-01) and one field blank (FB-01) were collected. Target analytes were not detected in these blank samples.
- The field duplicate pair samples were DUP-01/JRW-MW-15003 for boron and DUP-02/JRW-MW-15005 for calcium. All criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Pond 6

Laboratory Data Quality Review
Groundwater Sampling Event April 2022
Consumers Energy JR Whiting Pond 6

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the April 2022 groundwater monitoring sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by CE Laboratory Services, located in Jackson, Michigan. The laboratory analytical results were reported in laboratory project number 22-0325.

During the April 2022 sampling event, a groundwater sample was collected from each of the following wells:

- JRW-MW-16001
- JRW-MW-16002
- JRW-MW-16003
- JRW-MW-16004
- JRW-MW-16005
- JRW-MW-16006

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

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

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

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund 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 equipment blanks and field blanks. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- 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 the laboratory. 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.

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.

Findings

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable, with the exceptions noted below. The discussion that follows describes the QA/QC results and evaluation.

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 constituents as well as iron will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.
- When the data are evaluated through a detection monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One equipment blank (EB-02) and one field blank (FB-02) were collected. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample JRW-MW-16003 for total metals and anions. 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 MS/MSD recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- The field duplicate pair samples were DUP-02/JRW-MW-16004. All criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The nondetect RL for TDS (10 mg/L) in samples EB-02 and FB-02 was above the RL specified in the Sampling and Analysis Plan (1.0 mg/L).

Appendix B
Laboratory Reports

Pond 1 & 2

Consumers Energy
Count on Us®
Laboratory Services
A CENTURY OF EXCELLENCE

135 W. Trail St.
Jackson, MI 49201

phone 517-788-1251
fax 517-788-2533

To: MAMarion, P22-118

From: EBlaj, T-258

Date: April 24, 2022

Subject: RCRA GROUNDWATER MONITORING – JR WHITING POND 1 & 2 – 2022 Q1

CC: Sarah Holmstrom, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0324

CE Laboratory Services conducted groundwater monitoring at JR Whiting, Pond 1 & 2 on 04/06/2022, for the 1st Semiannual monitoring requirement, and 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 04/06/2022.

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

ilac-MRA A2LA ACCREDITED Certificate #1097.04

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, 22nd Edition, 2012.

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: JR Whiting Complex
Work Order ID: JRW RCRA GW Monitoring - Pond 1&2 - April 2022
Date Received: 4/6/2022
Chemistry Project: 22-0324

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0324-01	JRW-MW-15001	Groundwater	04/06/2022 11:46 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-02	JRW-MW-15002	Groundwater	04/06/2022 04:50 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-03	JRW-MW-15003	Groundwater	04/06/2022 03:45 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-04	JRW-MW-15004	Groundwater	04/06/2022 02:48 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-05	JRW-MW-15005	Groundwater	04/06/2022 01:45 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-06	JRW-MW-15006	Groundwater	04/06/2022 12:49 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-07	DUP-01	Groundwater	04/06/2022 12:00 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-08	EB-01	Groundwater	04/06/2022 05:00 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-09	FB-01	Groundwater	04/06/2022 05:01 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-10	JRW-MW-15006 Field MS	Groundwater	04/06/2022 12:49 PM	JRW RCRA GW Monitoring - Pond 1&2
22-0324-11	JRW-MW-15006 FIeld MSD	Groundwater	04/06/2022 12:49 PM	JRW RCRA GW Monitoring - Pond 1&2

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15001**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-01	Collect Time:	11:46 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	224		ug/L	20	04/15/2022	AB22-0415-04
Calcium	149000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	1110		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	43900		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	374000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-01-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	783		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15002**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-02	Collect Time:	04:50 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	235		ug/L	20	04/15/2022	AB22-0415-04
Calcium	132000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	779		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	39500		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	399000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-02-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	786		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15003**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-03	Collect Time:	03:45 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	251		ug/L	20	04/15/2022	AB22-0415-04
Calcium	123000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	526		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	41700		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	341000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-03-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	702		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15004**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-04	Collect Time:	02:48 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	260		ug/L	20	04/15/2022	AB22-0415-04
Calcium	129000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	104		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-04-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	44700		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	326000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-04-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	674		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15005**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-05	Collect Time:	01:45 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	213		ug/L	20	04/15/2022	AB22-0415-04
Calcium	122000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	419		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-05-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	31100		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	295000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-05-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	618		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15006**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-06	Collect Time:	12:49 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	242		ug/L	20	04/15/2022	AB22-0415-04
Calcium	134000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	450		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-06-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	41400		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	336000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-06-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	699		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**DUP-01**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-07	Collect Time:	12:00 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	211		ug/L	20	04/15/2022	AB22-0415-04
Calcium	125000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	411		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-07-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	31000		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	290000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-07-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	613		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**EB-01**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-08	Collect Time:	05:00 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	04/15/2022	AB22-0415-04
Calcium	ND		ug/L	1000	04/15/2022	AB22-0415-04
Iron	ND		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-08-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	ND		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-08-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site: **JRW RCRA GW Monitoring - Pond 1&2**
Field Sample ID: **FB-01**
Lab Sample ID: 22-0324-09
Matrix: Groundwater

Laboratory Project: **22-0324**
Collect Date: 04/06/2022
Collect Time: 05:01 PM

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	04/15/2022	AB22-0415-04
Calcium	ND		ug/L	1000	04/15/2022	AB22-0415-04
Iron	ND		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-09-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	ND		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0324-09-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15006 Field MS**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-10	Collect Time:	12:49 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	110		%	20	04/15/2022	AB22-0415-04
Calcium	117		%	1000	04/15/2022	AB22-0415-04
Iron	101		%	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-10-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	117		%	1000	04/11/2022	AB22-0412-01
Fluoride	88		%	1000	04/11/2022	AB22-0412-01
Sulfate	103		%	1000	04/12/2022	AB22-0412-01

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0324**
Field Sample ID:	**JRW-MW-15006 FIeld MSD**	Collect Date:	04/06/2022
Lab Sample ID:	22-0324-11	Collect Time:	12:49 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0324-11-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	103		%	20	04/15/2022	AB22-0415-04
Calcium	125		%	1000	04/15/2022	AB22-0415-04
Iron	120		%	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0324-11-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	117		%	1000	04/11/2022	AB22-0412-01
Fluoride	87		%	1000	04/11/2022	AB22-0412-01
Sulfate	103		%	1000	04/12/2022	AB22-0412-01

Data Qualifiers	Exception Summary
	No exceptions occured.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0324

Inspection Date: 04-07-22 **Inspection By:** CVH / KDR

Sample Origin/Project Name: JRW Q2-2022 POND 1 + 2

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) CVH / KDR - consumers

Tracking Number: _____ Shipping Form Attached: Yes _____ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler (1) Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 3.5 - 5.5 °c Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration DI5402, 6-3-22

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	22				
24 mL vial (glass)					
250~~500~~ mL (plastic)	9				
Other _____					

Pg. 2 of 2 not needed

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Page _____ of _____

SAMPLING SITE / CUSTOMER: JRW Pond 1&2 GW Monitoring – April 2022

PROJECT NUMBER: **22-0324**

SAP CC or WO#:

REQUESTER: Michelle Marion

SAMPLING TEAM: CET

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Michelle Marion — email: — phone:

COPY TO: TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	TDS	REMARKS
22-0324-01	4-6-22	1146	GW	JRW-MW-15001	3	2	1						x	x	x	
-02		1650	GW	JRW-MW-15002	3	2	1						x	x	x	
-03		1545	GW	JRW-MW-15003	3	2	1						x	x	x	
-04		1448	GW	JRW-MW-15004	3	2	1						x	x	x	
-05		1345	GW	JRW-MW-15005	3	2	1						x	x	x	
-06		1249	GW	JRW-MW-15006	3	2	1						x	x	x	
-07		1345	GW	DUP-01	3	2	1						x	x	x	
-08		1700	W	EB-01	3	2	1						x	x	x	
-09		1701	W	FB-01	3	2	1						x	x	x	
-10		1249	GW	JRW-MW-15006 MS	2	1	1						x	x		
-11		1249	GW	JRW-MW-15006 MSD	2	1	1						x	x		

RELINQUISHED BY: CET — DATE/TIME: 4-6-22 2000 — RECEIVED BY:

RELINQUISHED BY: — DATE/TIME: — RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No — M&TE #: 015402

Temperature: 3.5-5.5 °C — Cal. Due Date: 06/03/22

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

To: MAMarion, P22-118

From: EBlaj, T-258

Date: June 03, 2022

Subject: RCRA GROUNDWATER MONITORING – POND 1&2 VERIFICATION SAMPLES

CC: Sarah Holmstrom, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 20-0589

CE Laboratory Services conducted groundwater monitoring at JR Whiting Pond 1&2 on 05/20/2022, for the 1st Semiannual monitoring requirement, and as specified in the Sampling and Analysis Plan for the site. Only JRW-MW-15002, JRW-MW-15003, and JRW-MW-15005 were sampled in order to verify/confirm selected analytes. The samples were received by the Chemistry department of Laboratory Services for analysis on 05/20/2022.

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

ilac-MRA A2LA ACCREDITED Certificate #1097.04

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

I. Sample Receipt

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

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: JR Whiting Complex
Work Order ID: JRW RCRA GW Monitoring - Pond 1&2 Verification Samples
Date Received: 5/20/2022
Chemistry Project: 22-0530

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0530-01	JRW-MW-15002	Groundwater	05/20/2022 11:17 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0530-02	JRW-MW-15003	Groundwater	05/20/2022 10:25 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0530-03	JRW-MW-15005	Groundwater	05/20/2022 09:23 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0530-04	DUP-01	Groundwater	05/20/2022 12:00 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0530-05	DUP-02	Groundwater	05/20/2022 12:00 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0530-06	EB-01	Groundwater	05/20/2022 11:20 AM	JRW RCRA GW Monitoring - Pond 1&2
22-0530-07	FB-01	Groundwater	05/20/2022 11:19 AM	JRW RCRA GW Monitoring - Pond 1&2

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Analytical Report

Report Date: 06/03/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0530**
Field Sample ID:	**JRW-MW-15002**	Collect Date:	05/20/2022
Lab Sample ID:	22-0530-01	Collect Time:	11:17 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	224		ug/L	20	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0530**
Field Sample ID:	**JRW-MW-15003**	Collect Date:	05/20/2022
Lab Sample ID:	22-0530-02	Collect Time:	10:25 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	232		ug/L	20	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0530**
Field Sample ID:	**JRW-MW-15005**	Collect Date:	05/20/2022
Lab Sample ID:	22-0530-03	Collect Time:	09:23 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Calcium	120000		ug/L	1000	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0530**
Field Sample ID:	**DUP-01**	Collect Date:	05/20/2022
Lab Sample ID:	22-0530-04	Collect Time:	12:00 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	233		ug/L	20	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0530**
Field Sample ID:	**DUP-02**	Collect Date:	05/20/2022
Lab Sample ID:	22-0530-05	Collect Time:	12:00 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Calcium	118000		ug/L	1000	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-0530**
Field Sample ID:	**EB-01**	Collect Date:	05/20/2022
Lab Sample ID:	22-0530-06	Collect Time:	11:20 AM
Matrix:	Water		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	05/26/2022	AB22-0526-03
Calcium	ND		ug/L	1000	05/26/2022	AB22-0526-03
Iron	ND		ug/L	20	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Sample Site: **JRW RCRA GW Monitoring - Pond 1&2**
Field Sample ID: **FB-01**
Lab Sample ID: 22-0530-07
Matrix: Water

Laboratory Project: **22-0530**
Collect Date: 05/20/2022
Collect Time: 11:19 AM

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0530-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	05/26/2022	AB22-0526-03
Calcium	ND		ug/L	1000	05/26/2022	AB22-0526-03
Iron	ND		ug/L	20	05/26/2022	AB22-0526-03

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Analytical Report

Report Date: 06/03/22

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0530

Inspection Date: 05/20/2022 **Inspection By:** CVH

Sample Origin/Project Name: JRWhiting Re-Sample

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) CET - CONSUMERS

Tracking Number: _____ Shipping Form Attached: Yes _____ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler (1) Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 4.0 - 6.0 °C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015484 | 10.12.22

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	7				
24 mL vial (glass)					
500 mL (plastic)					
Other _____					

 PG-292 not needed

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Page 1 of 1

SAMPLING SITE / CUSTOMER: JRW Pond 1&2 GW Monitoring – May 2022 Verif.

PROJECT NUMBER: 22-0530

SAP CC or WO#:

REQUESTER: Michelle Marion

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Michelle Marion — email: — phone:

COPY TO: TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	REMARKS
22-0530-01	5-20-22	1117	GW	JRW-MW-15002	1		1						x	
-02		1025	GW	JRW-MW-15003	1		1						x	
-03		0923	GW	JRW-MW-15005	1		1						x	
-04		—	GW	DUP-01	1		1						x	
-05		—	GW	DUP-02	1		1						x	
-06		1120	W	EB-01	1		1						x	
-07		~~1119~~ 1119	W	FB-01	1		1						x	

RELINQUISHED BY: [signature] DATE/TIME: 5-20-22 1345 RECEIVED BY: [signature]

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

Received on Ice? ☒ Yes ☐ No M&TE #: 015484

Temperature: 4.0-4.0 °C Cal. Due Date: 10-12-22

Pond 6

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

To: MAMarion, P22-118

From: EBlaj, T-258

Date: April 24, 2022

Subject: RCRA GROUNDWATER MONITORING – JR WHITING POND 6 – 2022 Q1

CC: Sarah Holmstrom, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0325

CE Laboratory Services conducted groundwater monitoring at JR Whiting, Pond 6, on 04/06/2022, for the 1st Semiannual monitoring requirement, and as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis in the Chemistry department of Laboratory Services on 04/06/2022.

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

ilac-MRA A2LA ACCREDITED Certificate #1097.04

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

I. Sample Receipt

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

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

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

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LRB	Laboratory Reagent Blank (also referred to as Method Blank)
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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
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D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: JR Whiting Complex
Work Order ID: JRW RCRA GW Monitoring - Pond 6 - April 2022
Date Received: 4/6/2022
Chemistry Project: 22-0325

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0325-01	JRW-MW-16001	Groundwater	04/06/2022 05:36 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-02	JRW-MW-16002	Groundwater	04/06/2022 02:11 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-03	JRW-MW-16003	Groundwater	04/06/2022 01:11 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-04	JRW-MW-16004	Groundwater	04/06/2022 12:31 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-05	JRW-MW-16005	Groundwater	04/06/2022 05:15 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-06	JRW-MW-16006	Groundwater	04/06/2022 04:31 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-07	DUP-02	Groundwater	04/06/2022 12:00 AM	JRW RCRA GW Monitoring - Pond 6
22-0325-08	EB-02	Groundwater	04/06/2022 05:45 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-09	FB-02	Groundwater	04/06/2022 04:42 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-10	JRW-MW-16003 Field MS	Groundwater	04/06/2022 01:11 PM	JRW RCRA GW Monitoring - Pond 6
22-0325-11	JRW-MW-16003 FIeld MSD	Groundwater	04/06/2022 01:11 PM	JRW RCRA GW Monitoring - Pond 6

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16001**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-01	Collect Time:	05:36 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	172		ug/L	20	04/15/2022	AB22-0415-04
Calcium	99000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	147		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	18400		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	248000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-01-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	514		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16002**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-02	Collect Time:	02:11 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	199		ug/L	20	04/15/2022	AB22-0415-04
Calcium	143000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	243		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	20300		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	388000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-02-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	738		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16003**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-03	Collect Time:	01:11 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	240		ug/L	20	04/15/2022	AB22-0415-04
Calcium	131000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	495		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	26700		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	384000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-03-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	731		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16004**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-04	Collect Time:	12:31 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	225		ug/L	20	04/15/2022	AB22-0415-04
Calcium	159000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	518		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-04-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	36400		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	449000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-04-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	853		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16005**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-05	Collect Time:	05:15 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	208		ug/L	20	04/15/2022	AB22-0415-04
Calcium	122000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	409		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-05-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	22900		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	308000		ug/L	1000	04/12/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-05-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	642		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16006**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-06	Collect Time:	04:31 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	188		ug/L	20	04/15/2022	AB22-0415-04
Calcium	112000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	226		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-06-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	27200		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	36100		ug/L	1000	04/13/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-06-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	563		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**DUP-02**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-07	Collect Time:	12:00 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	219		ug/L	20	04/15/2022	AB22-0415-04
Calcium	154000		ug/L	1000	04/15/2022	AB22-0415-04
Iron	542		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-07-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	35700		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	445000		ug/L	1000	04/13/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-07-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	867		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**EB-02**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-08	Collect Time:	05:45 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	04/15/2022	AB22-0415-04
Calcium	ND		ug/L	1000	04/15/2022	AB22-0415-04
Iron	ND		ug/L	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-08-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	ND		ug/L	1000	04/13/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-08-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**FB-02**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-09	Collect Time:	04:42 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	04/15/2022	AB22-0415-04
Calcium	ND		ug/L	1000	04/15/2022	AB22-0415-04
Iron	ND		ug/L	20	04/22/2022	AB22-0415-04

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

Aliquot: 22-0325-09-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Fluoride	ND		ug/L	1000	04/11/2022	AB22-0412-01
Sulfate	ND		ug/L	1000	04/13/2022	AB22-0412-01

Total Dissolved Solids by SM 2540C

Aliquot: 22-0325-09-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	04/07/2022	AB22-0407-16

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16003 Field MS**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-10	Collect Time:	01:11 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	120		%	20	04/15/2022	AB22-0415-04
Calcium	100		%	1000	04/15/2022	AB22-0415-04
Iron	107		%	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-10-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	102		%	1000	04/11/2022	AB22-0412-01
Fluoride	85		%	1000	04/11/2022	AB22-0412-01
Sulfate	101		%	1000	04/13/2022	AB22-0412-01

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Analytical Report

Report Date: 04/24/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-0325**
Field Sample ID:	**JRW-MW-16003 FIeld MSD**	Collect Date:	04/06/2022
Lab Sample ID:	22-0325-11	Collect Time:	01:11 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-0325-11-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	114		%	20	04/15/2022	AB22-0415-04
Calcium	97		%	1000	04/15/2022	AB22-0415-04
Iron	110		%	20	04/15/2022	AB22-0415-04

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

Aliquot: 22-0325-11-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	103		%	1000	04/11/2022	AB22-0412-01
Fluoride	88		%	1000	04/11/2022	AB22-0412-01
Sulfate	100		%	1000	04/13/2022	AB22-0412-01

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Analytical Report

Report Date: 04/24/22

Data Qualifiers	Exception Summary
	No exceptions occured.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0325

Inspection Date: 04-07-22 **Inspection By:** CLH | KDR

Sample Origin/Project Name: JRW Q2-2022 PONDS

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) CLH | KDR - CONSUMERS

Tracking Number: _____ Shipping Form Attached: Yes _____ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler (1) Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1.8 - 5.2°C Samples Received on Ice: Yes Y No _____

M&TE # and Expiration CIS402 6.3.22

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	22				
24 mL vial (glass)					
250 ~~500~~ mL (plastic)	9				
Other _____					

PFAS not needed

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Page 1 of 1

SAMPLING SITE / CUSTOMER: JRW Pond 6 GW Monitoring – April 2022

PROJECT NUMBER: 22-0325

SAP CC or WO#:

REQUESTER: Michelle Marion

SAMPLING TEAM: CLH/ KDR

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Michelle Marion — email: — phone:

COPY TO: TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	REMARKS
22-0325-01	4/6/22	1736	GW	JRW-MW-16001	3	2	1						x	x	x	
-02	4/6/22	1411	GW	JRW-MW-16002	3	2	1						x	x	x	
-03	4/6/22	1311	GW	JRW-MW-16003	3	2	1						x	x	x	
-04	4/6/22	1231	GW	JRW-MW-16004	3	2	1						x	x	x	
-05	4/6/22	1715	GW	JRW-MW-16005	3	2	1						x	x	x	
-06	4/6/22	1631	GW	JRW-MW-16006	3	2	1						x	x	x	
-07	4/6/22	—	GW	DUP-02	3	2	1						x	x	x	
-08	4/6/22	1745	W	EB-02	3	2	1						x	x	x	
-09	4/6/22	1642	W	FB-02	3	2	1						x	x	x	
-10	4/6/22	1311	GW	JRW-MW-16003 MS	2	1	1						x	x		
-11	4/6/22	1311	GW	JRW-MW-16003 MSD	2	1	1						x	x		

RELINQUISHED BY: Caleb Hannew — DATE/TIME: 4.6.22 2000 — RECEIVED BY:

RELINQUISHED BY: — DATE/TIME: — RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No — M&TE #: 015402

Temperature: 1.8-5.2 °C — Cal. Due Date: 6.8.22

Appendix C
Field Notes

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WATER LEVEL DATA

Site: JR Whiting
Project No: 22-0324 Pond 1 & 2 Reviewed by:
Analyst: CET Review Date: 04-18-22
Date: 4-6-22
Method:
Tape ID: Solinst S/N: 379857

Well ID	Time	DTW Trial 1 (ft)	DTW Trial 2 (ft)	DTB (ft)	Remarks
JRW MW-15001	1050	4.27	4.27	81.68	
JRW MW-15002	0955	13.07	13.07	91.99	
JRW MW-15003	1003	10.06	10.06	90.00	
JRW MW-15004	1010	12.21	12.21	96.17	
JRW MW-15005	1017	11.13	11.13	93.36	
JRW MW-15006	1035	3.37	3.37	~~64.44~~ 82.70 4-6-22	
JRW MW-16001					marked TOC
JRW MW-16002					marked TOC
JRW MW-16003					marked TOC
JRW MW-16004					marked TOC
JRW MW-16005					marked TOC
JRW MW-16006					marked TOC
JRW MW-16007					marked TOC
JRW MW-16008					marked TOC
JRW MW-16009					marked TOC

NOTES: *TOC reference point*
DTW = Depth to Water
DTB = Depth to Bottom

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Sonde ID	20G
Start Date	4.6.22
Project #	22-0324, 22-0325
Site	JR Whiting Q2-2022
Reviewed By & Date	04-18-2022

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 20G101513
Sonde Brand	YSI ProDSS S/N 20G101574
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 20H100646
Turbidity Probe	YSI ProDSS S/N 20G104758
pH With ORP	YSI ProDSS S/N 20G105177
Conductivity & Temperature Probe	YSI ProDSS S/N 20G104783

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	21380101	9-13-22	3.99					3.97
7.0	GFS # 1639	21380102	9-24-23	6.98					6.99
10.0	GFS # 1645	21340232	8-28-23	10.04					10.03
			Initials & Date:	4-5-22					CLH 4.7.22

- Are the calibration values within ±0.10 of the standard? (Y) or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
228 (mV)	GFS	21430188	8-19-22	226.2					226.8
			Initials & Date:	4-5-22					CLH 4.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	98.0					98.1
			Initials & Date:	4-5-22					CLH 4-18-22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2) EM 040722
- Are the calibration values within 90-110%? (Y) or N (if no, recalibration is required)

Sonde ID	20G	Project # :	22-0324 22-0325
Start Date	4.6.2022		
Reviewed By & Date:	04-18-2022	Site:	JR whiting Q2.2022

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1421	GFS	21280049	7.12.22	1438					1431
			Initials & Date:	CH 4-5-22					CH 4.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within range of the standard? (Y) or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.00					0.03
10.0 (± 1.0 NTUs)	Hach 2659949	✓	✓	N/A	✓	✓	N/A	✓	✓
40.0 (± 4.0 NTUs)	Hach 2746356	A0294	10-2022	42.54					41.01
			Initials & Date:	CH 4-5-22					CH 4.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS Chemicals			pH 9.0 Check	GFS Chemicals		
pH 7.0	GFS Chemicals						
pH 10.0	GFS Chemicals						
Sp. Conductivity	GFS Chemicals						
40.0 Turbidity	GFS Chemicals						
10.0 Turbidity	GFS Chemicals						

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID MW 15001 Date 4-6-22 Control Number 22-0324-01

Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 379857

QC SAMPLE: ☒ ~~MS/MSD~~ 4-6-22 ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☑ 20G

Depth-to-water T/PVC (ft) 4.27 Depth-To-Bottom T/PVC (ft) 81.68 Completed by CES

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1103							200	4.35	
1105	7.25	11.0	1093	8.8	0.97	71.3	200	4.35	6.01
1110	7.26	11.0	1097	7.2	0.79	1.8	200	4.35	6.57
1115	7.29	11.0	1099	6.2	0.68	-43.7	200	4.35	6.85
1120	7.38	11.2	1100	4.5	0.49	-93.7	200	4.35	5.06
1125	7.43	11.2	1100	4.1	0.45	-107.9	200	4.35	5.76
1130	7.47	11.3	1101	3.5	0.38	-120.3	200	4.35	5.95
1135	7.49	11.3	1101	3.4	0.37	-126.8	200	4.35	5.46
1140	7.51	11.5	1101	3.2	0.35	-131.7	200	4.35	5.52
1145	7.52	11.5	1101	3.2	0.34	-134.8	200	4.35	5.49
1146									
1150									

Total Pump Time (min): 47 Total Purge Volume (gal) : ≈ 2.5 gal Reviewed by: JT

Weather: low 50s windy cloudy light rain Review Date: 04-18-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125ml	HDPE	B	N					
1	〃	〃	A	〃					
1	250mL	〃	〃	〃					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

Laboratory Services

Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID MW-1500Z Date 4-6-22 Control Number 22-0324-02
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel
Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer
Depth to Water Tape: Solinst S/N: 379857

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☑ 20G

Depth-to-water T/PVC (ft) 13.07 Depth-To-Bottom T/PVC (ft) 91.99 Completed by CET

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
				Stablization parameters for the last three readings					
1607							200	13.10	
1609	7.73	11.7	824	24.5	2.58	-11.8	200	13.10	2.15
1614	7.53	11.6	866	9.0	0.96	-57.0	200	13.10	2.04
1619	7.47	11.6	1000	5.5	0.60	-90.5	200	13.10	2.54
1624	7.52	11.6	1107	3.7	0.40	-129.3	200	13.10	2.37
1629	7.55	11.6	1119	3.5	0.37	-139.7	200	13.10	3.10
1634	7.58	11.5	1126	3.1	0.34	-150.4	200	13.10	3.41
1639	7.59	11.6	1127	2.9	0.32	-157.3	200	13.10	3.19
1644	7.60	11.6	1129	2.8	0.31	-162.1	200	13.10	3.43
1649	7.60	11.6	1130	2.8	0.30	-165.7	200	13.10	3.91
1650									
1655									

Total Pump Time (min): 48 Total Purge Volume (gal): ≈ 2.5 gal Reviewed by: JT
Weather: low 50's windy cloudy light rain Review Date: 04-18-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - ____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	1L	"	A	"					
1	250mL	"	A	"					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID MW-15003 Date 4-6-22 Control Number 22-0324-03

Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 379857

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☑ 20G

Depth-to-water T/PVC (ft) 10.06 Depth-To-Bottom T/PVC (ft) 90.00 Completed by CET

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
				Stablization parameters for the last three readings					
1502							200	10.07	
1504	7.68	11.6	1000	44.6	4.77	58.6	200	10.08	6.67
1509	7.64	11.8	1003	15.5	1.66	-64.4	200	10.10	5.26
1514	7.64	11.8	1004	8.6	0.92	-85.7	200	10.10	5.10
1519 1524 cimg.22	7.65	11.9	1004	5.7	0.61	-99.9	200	10.10	4.29
1529	7.65	12.0	1003	5.2	0.56	-104.9	200	10.60	4.68
1529	7.66	12.0	1003	4.4	0.47	-110.6	200	10.60	4.73
1534	7.67	12.0	1004	3.7	0.40	-117.6	200	10.60	4.77
1539	7.67	12.1	1003	3.6	0.39	-117.0	200	10.60	4.93
1544	7.67	12.1	1004	3.5	0.38	-117.7	200	10.60	4.92
1545									
1549									

Total Pump Time (min): 47 Total Purge Volume (gal) : ≈ 2 gal Reviewed by:

Weather: low 50's windy cloudy light rain Review Date: 04-18-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	1	1	A	1					
1	250mL	1	1	1					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID MW 1800M Date 4.6.22 Control Number 22-0324-04
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel
Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer
Depth to Water Tape: Solinst S/N: 379857

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☑ 20G

Depth-to-water T/PVC (ft) 12.21 Depth-To-Bottom T/PVC (ft) 96.17 Completed by CG

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
			Stablization parameters for the last three readings						
1400							200	12.21	
1402	7.30	11.1	969	34.8	3.78	71.0	200	12.21	4.18
1407	7.40	11.0	970	27.0	2.97	62.2	200	12.21	3.31
1412	7.46	11.1	969	24.4	2.67	52.0	200	12.21	4.55
1417	7.47	11.1	969	22.8	2.49	44.9	200	12.21	3.75
1422	7.49	11.3	969	20.1	2.19	40.7	200	12.21	4.70
1427	7.50	11.2	969	17.5	1.92	39.7	200	12.21	3.91
1432	7.50	11.2	969	16.2	1.77	38.3	200	12.21	4.16
1437	7.50	11.3	968	13.4	1.46	36.8	200	12.21	4.09
1442	7.50	11.3	969	13.1	1.30	35.7	200	12.21	4.27
1447	7.50	11.3	968	13.0	1.31	35.3	200	12.21	3.91
1448									
1452									

Total Pump Time (min): 52 Total Purge Volume (gal): ≈ 2.5, 4 Reviewed by:
Weather: low 50's windy cloudy light rain Review Date: 04-18-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	D						
1	〃	〃	A						
1	250mL	〃	〃						

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID MW-1500S Date 4-6-22 Control Number 22-032H-05

Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 379857

QC SAMPLE: ☐ MS/MSD ☑ DUP 01 Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☑ 20G

Depth-to-water T/PVC (ft) 11.13 Depth-To-Bottom T/PVC (ft) 93.36 Completed by CET

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1317							200	11.20	
1319	7.33	12.3	893	33.5	3.55	60.3	200	11.21	7.07
1324	7.43	12.4	889	28.3	3.01	49.6	200	11.21	7.43
1329	7.53	12.5	889	26.5	2.82	43.1	200	11.21	6.91
1334	7.56	12.5	889	25.8	2.74	42.4	200	11.21	6.32
1339	7.58	12.5	888	25.1	2.67	41.3	200	11.21	5.91
1344	7.59	12.5	888	24.5	2.60	42.2	200	11.21	5.86
1345									
1351									

Total Pump Time (min): 34 Total Purge Volume (gal): ≈ 1.5 gal Reviewed by: JF

Weather: low 50's windy cloudy light rain Review Date: 04-18-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	D	N					
2	1L	〃	A	〃					
2	250mL	〃	I	〃					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID MW-1506 Date 4-6-22 Control Number 22-0324-06
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel
Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer
Depth to Water Tape: S/N: 379857
QC SAMPLE: ☑ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☑ 20G
Depth-to-water T/PVC (ft) 7.37 Depth-To-Bottom T/PVC (ft) 82.70 Completed by CFT

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1221							200	3.40	
1223	7.43	11.3	1003	67.3	7.34	24.3	200	3.43	7.61
1224	7.46	11.3	992	65.3	7.14	9.3	200	3.43	6.73
1233	7.42	11.5	991	64.2	6.98	13.5	200	3.43	6.04
1238	7.51	11.5	992	62.4	6.79	19.0	200	3.43	6.61
1243	7.55	11.5	992	59.5	6.47	23.0	200	3.43	6.51
1248	7.57	11.4	992	57.5	6.35	26.2	200	3.43	6.43
1249									
1300									

Total Pump Time (min): 39 Total Purge Volume (gal) : ~ 2gal Reviewed by:
Weather: low 50s windy cloudy light rain Review Date: 04-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125mL	HDPE	B	N					
3	1	1	A	1					
3	250mL	1	1	1					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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WATER LEVEL DATA

Site: JR Whiting
Project No: 22-0324, 0325 (Pond 6) **Reviewed by:** JF
Analyst: CLH, KDR **Review Date:** 04-18-22
Date: 4.6.22
Method: Electronic Tape
Tape ID: GeoTech **S/N:** 1005

Well ID	Time	DTW Trial 1 (ft)	DTW Trial 2 (ft)	DTB (ft)	Remarks
JRW MW-15001					
JRW MW-15002					
JRW MW-15003					
JRW MW-15004					
JRW MW-15005					
JRW MW-15006					
JRW MW-16001	1041	15.26	15.26	84.00	marked TOC
JRW MW-16002	1046	11.44	11.44	94.45	marked TOC
JRW MW-16003	1051	11.91	11.91	86.02	marked TOC
JRW MW-16004	1058	12.25	12.25	88.85	marked TOC
JRW MW-16005	1034	15.05	15.05	91.41	marked TOC
JRW MW-16006	1031	13.95	13.95	91.70	marked TOC
JRW MW-16007	0940	5.23	5.23	81.01	marked TOC
JRW MW-16008	0946	5.75	5.75	~~76.33~~ CLH 04/06/22 75.97	marked TOC
JRW MW-16009	0952	5.51	5.51	81.91	marked TOC

NOTES: *TOC reference point*
DTW = Depth to Water
DTB = Depth to Bottom

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Sonde ID	21G
Start Date	4.6.2022
Project #	J1 22-0324, 22-0325
Site	JR Whiting Q2-2022
Reviewed By & Date	04-18-2022

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 21G102278
Sonde Brand	YSI ProDSS S/N 21G105848
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 21G101534
Turbidity Probe	YSI ProDSS S/N 21G101646
pH With ORP	YSI ProDSS S/N 21H101604
Conductivity & Temperature Probe	YSI ProDSS S/N 21G101888

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	21380101	9-13-23	3.97					4.02
7.0	GFS # 1639	21380102	9.24.23	7.02					7.01
10.0	GFS # 1645	21340292		10.00					10.01
			Initials & Date:	4.5.22					CLH 4.7.22

- Are the calibration values within ±0.10 of the standard? (Y) or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
228 (mV)	GFS	21430186	8/19/22	226.0					226.0
			Initials & Date:	4.5.22					CLH 4.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre-Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	95.8					95.9
			Initials & Date:	4.5.22					CLH 4.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within 90-110%? (Y) or N (if no, recalibration is required)

Sonde ID	21G	Project #: 22-0324, 22-0325
Start Date	4.6.22	
Reviewed By & Date:	04-18-2022	Site: JR Whiting Q2.2022

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1429 ~~GFS~~ CH 4.5.22	GFS	21250049	7-12-22	1389					1391
			Initials & Date:	CH 4-5-22					CH 4.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within range of the standard? (Y) or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	-0.20					-0.09
10.0 (± 1.0 NTUs)	Hach 2659949			N/A			N/A		
40.0 (± 4.0 NTUs)	Hach 2746356	A0294	10-2022	40.96					41.00
			Initials & Date:	CH 4-5-22					~~CH~~ 04.7.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS Chemicals			pH 9.0 Check	GFS Chemicals		
pH 7.0	GFS Chemicals						
pH 10.0	GFS Chemicals						
Sp. Conductivity	GFS Chemicals						
40.0 Turbidity	GFS Chemicals						
10.0 Turbidity	GFS Chemicals						

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID JRW MW-16001 Date 4/6/22 Control Number 22-0325-01
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☐ 20G 21G

Depth-to-water T/PVC (ft) 15.26 Depth-To-Bottom T/PVC (ft) 84.00 Completed by CLH, KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
				Stablization parameters for the last three readings					
1425	Started pump						160	15.26	
1430	11.67	11.8	1165	39.8	4.30	-105.-109.2	160	15.33	
1435	High volume purge to high pH								
1440									
1445	High volume purge to high pH							15.50	
1450									
1455	High volume purge due to high pH					purged 4 gal		15.51	
1500									
1505	High volume purge					purged 5 gal			
1720	7.99	11.7	761	3.1	0.34	-121.6	232	15.33	3.55
1725	7.98	11.7	760	3.1	0.33	-127.8	232	15.33	3.39
1730	8.00	11.7	758	3.0	0.33	-125.5	232	15.33	2.60
1735	8.02	11.7	757	3.0	0.32	-130.8	232	15.33	2.67
1736	Collected sample								

Total Pump Time (min): 191 Total Purge Volume (gal) : >20 Reviewed by: JF

Weather: 51°F windy, cloudy, light rain Review Date: 04-18-22

Comments: pH= 7.5-8.9

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	HDPE	A	N					
1	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID JRW MW-16002 Date 4/6/22 Control Number 22-0325-02
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☐ 20G (216)

Depth-to-water T/PVC (ft) 11.65 Depth-To-Bottom T/PVC (ft) 44.45 Completed by CLH, KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1330	Started pump							11.65	
1345	8.00	11.3	948	3.6	0.40	-127.1	188	11.73	4.88
1350	7.94	11.3	967	3.6	0.39	-127.5	188	#11.74	3.31
1355	7.91	11.3	976	3.0	0.32	-131.0	188	11.75	2.79
1400	7.89	11.3	980	2.7	0.30	-133.9	188	11.75	2.47
1405	7.88	11.2	981	2.6	0.28	-135.6	188	11.75	2.72
1410	7.88	11.2	982	2.5	0.28	-136.4	188	11.75	
1411	Collected sample								

Total Pump Time (min): 41 Total Purge Volume (gal) : 1.5 Reviewed by: JF
Weather: 52°F windy, cloudy, light rain Review Date: 04-18-22

Comments: pH = 7.5 - 8.3

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	HDPE	A	N					
1	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID JRW-MW-16003 Date 4/6/22 Control Number 22-0325-03, -10, -11
Location J.R Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE: ☑ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☐ 20G (21G)

Depth-to-water T/PVC (ft) 11.88 Depth-To-Bottom T/PVC (ft) 86.02 Completed by CLH, KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1242	Started pump						184	11.92	
1250	7.72	11.6	993	3.4	0.37	-121.2	184	11.94	3.72
1255	7.70	11.6	994	3.3	0.35	-123.3	184	11.92	3.96
1300	7.69	11.7	993	2.7	0.29	-125.5	184	11.93	1.83
1305	7.68	11.7	992	2.6	0.28	-126.2	184	11.93	2.68
1310	7.69	11.6	991	2.5	0.27	-127.5	184	11.93	2.37
1311	Collected sample								

Total Pump Time (min): 29 Total Purge Volume (gal) : 1.5 Reviewed by: JF
Weather: 52°F Cloudy, windy, light rain Review Date: 04-18-22

Comments: pH = 7.4-7.9

Bottles Filled					Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____				
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
3	125 mL	HDPE	B	N					
3	125mL	HDPE	A	N					
1	250 mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID JRW MW-16004 Date 4.6.22 Control Number 22-0325-04, -07
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE: ☐ MS/MSD ☑ DUP 02 Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☐ 20G (21G)

Depth-to-water T/PVC (ft) 12.25 Depth-To-Bottom T/PVC (ft) 88.85 Completed by WH | KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1107	Started pump						260	12.25	
1125	9.25	11.9	896	67.90	7.30	+88.80	260	12.30	3.15
1130	High volume purge to lower pH value								
1135									
1140	Purged 2.2 gallons ; pH = 9.95					DTW=	12.36		
1145									
1150	Purged Total 4.0 gallons; pH = 8.16						268		
1155	7.78	12.00	1142	5.60	0.54	-122.90	268	12.30	6.82
1200	7.73	11.90	1142	4.60	0.49	-124.40	268	12.30	3.32
1205	7.72	11.80	1144	3.90	0.42	-125.10	268	12.30	3.09
1210	7.72	11.80	1144	3.40	0.37	-125.80	268	12.30	3.02
1215	7.71	11.80	1143	3.10	0.34	-126.10	268	12.30	2.34
1220	7.69	11.90	1144	2.90	0.31	-126.50	268	12.30	2.46
1225	7.69	11.90	1143	2.80	0.30	-126.90	268	12.30	2.33
1230	7.69	11.80	1144	2.70	0.29	-126.90	268	12.30	2.21

Total Pump Time (min): 84 Total Purge Volume (gal) : 5.5 Reviewed by:

Weather: 51°F, cloudy, windy Review Date: 04-18-22

Comments: Collected sample at 12:31 pH= 7.4 ~ 8.2

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	B	N					
2	125mL	HDPE	A	N					
2	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW MW-16005 Date 4/6/22 Control Number 22-0325-05
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☐ 20G (216)

Depth-to-water T/PVC (ft) 15.64 Depth-To-Bottom T/PVC (ft) 41.41 Completed by CLH, KJDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1640	Started pump						248	15.04	
1645	7.71	12.0	888	4.0	0.43	-159.4	248	15.04	3.32
1650	7.72	12.0	888	2.8	0.31	-166.7	248	15.04	4.81
1655	7.73	12.1	891	2.5	0.27	-168.8	248	15.04	1.03
1700	7.73	12.2	892	2.4	0.25	-169.4	248	15.04	0.67
1705	7.73	12.2	892	2.2	0.24	-170.5	248	15.04	0.89
1710	7.73	12.2	891	2.2	0.23	-170.1	248	15.04	0.80
1715	Collected sample						248	15.04	

Total Pump Time (min): 35 Total Purge Volume (gal) : 2.1 Reviewed by: JF
Weather: 50°F windy, cloudy, light rain Review Date: 04-18-22

Comments: Collected field blank at 1642 pH = 7.3-8.0

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	HDPE	A	N					
1	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW MW-16006 Date 4/6/22 Control Number 22-0325-06
Location JR whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Geotech S/N: 1005

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 11M ☐ 15H ☐ 19M ☐ 20G (21G)

Depth-to-water T/PVC (ft) 13.93 Depth-To-Bottom T/PVC (ft) 41.70 Completed by CLH/KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1535	Started pump						200	13.93	
1540	8.62	11.8	794	12.5	1.30	30.8	–	14.01	2.81
– High volume purge to lower pH value purged 1 gal									
1550	7.69	11.8	793	3.3	0.35	-6.9	200	14.01	2.65
1555	7.59	11.7	793	3.0	0.32	-65.9	200	14.01	2.72
1600	7.55	11.7	795	2.9	0.31	-101.5	200	14.01	2.63
1605	7.54	11.7	797	2.8	0.30	-124.7	200	14.01	2.92
1610	7.54	11.7	800	2.7	0.29	-140.6	200	14.01	2.82
1615	7.56	11.7	803	2.6	0.28	-153.5	200	14.01	2.91
1620	7.58	11.6	806	2.2	0.24	-165.8	200	14.01	3.23
1625	7.60	11.6	809	2.3	0.25	-172.4	200	14.01	3.36
1630	7.61	11.7	811	2.3	0.25	~~-15~~ -175.5	200	14.01	3.43
1631	Collected sample								

Total Pump Time (min): 55 Total Purge Volume (gal) : 9.5 Reviewed by:

Weather: 50°F windy, cloudy, Rain Review Date: 04-18-22

Comments: pH = 7.5 – 8.2

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	HDPE	A	N					
1	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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WATER LEVEL DATA

Site: JR Whiting

Project No: 22-0530

Analyst: CGT **Reviewed by:**

Date: 5-20-22 **Review Date:** 05-23-2022

Method: Electronic Tape

Tape ID: Solinst **S/N:** 379851

Well ID	Time	DTW Trial 1 (ft)	DTW Trial 2 (ft)	DTB (ft)	Remarks
JRW MW-15001					
JRW MW-15002	1038	13.07	13.07	91.90	
JRW MW-15003	0936	10.07	10.07	89.91	
JRW MW-15004					
JRW MW-15005	0849	11.03	11.03	93.30	
JRW MW-15006					
JRW MW-16001					
JRW MW-16002					
JRW MW-16003					
JRW MW-16004					
JRW MW-16005					
JRW MW-16006					
JRW MW-16007					
JRW MW-16008					
JRW MW-16009					

NOTES: *TOC reference point*
DTW = Depth to Water
DTB = Depth to Bottom

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID MW-15002 Date 5-20-22 Control Number 22-0530-01
Location JRW Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 379851

QC SAMPLE: ☐ **MS/MSD** ☐ **DUP**____ **Sonde ID:** ☐ 11M ☐ 19H ☑ 20M ☐ 21G

Depth-to-water T/PVC (ft) 13.07 Depth-To-Bottom T/PVC (ft) 91.90 Completed by CET

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1039							200	13.10	
1041	7.73	15.3	1134	7.5	0.74	-79.1	200	13.10	9.17
1046	7.44	15.3	1134	5.7	0.57	-100.7	200	13.10	8.62
1051	7.55	15.3	1136	4.6	0.45	-122.8	200	13.10	6.18
1056	7.63	15.5	1137	3.7	0.36	-142.7	200	13.10	5.00
1101	7.65	15.8	1135	3.4	0.34	-150.5	200	13.10	4.97
1106	7.67	15.5	1136	3.2	0.32	-155.9	200	13.10	4.42
1111	7.67	15.8	1135	3.1	0.31	-160.1	200	13.10	4.59
1116	7.68	16.0	1131	3.1	0.30	-162.5	200	13.10	4.55
1117									
1118									

Total Pump Time (min): 39 Total Purge Volume (gal) : ≈ 2 gal Reviewed by:
Weather: 72°F · Partly Sunny 10 mph wind Review Date: 05-23-2022

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID MW-15003 Date 5-20-22 Control Number 22-0530-02
Location JRW Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 379851

QC SAMPLE: ☐ MS/MSD ☑ DUP 01 **Sonde ID:** ☐ 11M ☐ 19H ☑ 20M ☐ 21G

Depth-to-water T/PVC (ft) 10.07 Depth-To-Bottom T/PVC (ft) 89.91 Completed by CEF

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
0937							200	10.11	
0939	7.99	15.7	1000	66.4	6.55	89.4	200	10.11	5.16
0944	7.83	16.0	1001	63.0	6.20	85.7	200	10.11	6.10
0949	7.78	15.9	1002	61.0	6.00	78.0	200	10.11	6.05
0954	7.74	15.8	1003	45.6	4.50	8.1	200	10.11	5.96
0959	7.73	15.4	1003	34.6	3.80	-25.8	200	10.11	5.82
1004	7.71	15.9	1005	28.4	2.79	-51.4	200	10.11	6.01
1009	7.71	16.0	1003	26.4	2.61	-63.1	200	10.11	5.62
1014	7.71	16.2	1003	25.1	2.45	-75.9	200	10.11	5.17
1019	7.72	16.5	1002	25.6	2.49	-77.8	200	10.11	5.13
1024	7.72	16.5	1004	24.9	2.32	-79.9	200	10.11	4.96
1025									
1027									

Total Pump Time (min): 50 Total Purge Volume (gal) : ≈ 2.5 gal Reviewed by:
Weather: 71°F Cloudy, Wind 13 mph of 20:21 Review Date: 05-23-2022

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	B						

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID MW-15005 Date 5-20-22 Control Number 22-0530-03

Location JRW Well Material: ☐ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 379851

QC SAMPLE: ☐ MS/MSD ☑ DUP-02 Sonde ID: ☐ 11M ☐ 19H ☑ 20M ☐ 21G

Depth-to-water T/PVC (ft) 11.03 Depth-To-Bottom T/PVC (ft) 93.30 Completed by CES

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
0850							200	11.07	
0852	8.34	16.1	880	32.7	3.19	114.0	200	11.12	4.97
0857	7.75	16.0	893	27.7	2.73	126.2	200	11.12	4.35
0902	7.70	15.9	892	26.2	2.58	119.9	200	11.12	4.69
0907	7.69	16.1	893	25.3	2.48	111.1	200	11.12	5.47
0912	7.69	16.3	893	24.7	2.42	103.8	200	11.12	4.99
0917	7.69	16.2	893	24.8	2.43	100.0	200	11.12	4.60
0922	7.69	16.4	893	24.4	2.39	98.2	200	11.12	4.61
0923									
0925									

Total Pump Time (min): 35 Total Purge Volume (gal) : ≈ 1.75 gal Reviewed by:

Weather: 69° Cloudy, low winds Review Date: 05-23-2022

Comments:

Bottles Filled					Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____				
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	05-20-22 B	N					

* *Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Sonde ID	**20G**
Start Date	5-2022
Project #	22-0530
Site	JR Whiting
Reviewed By & Date	05-23-2022

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 20G101513
Sonde Brand	YSI ProDSS S/N 20G101574
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 20H100646
Turbidity Probe	YSI ProDSS S/N 20G104758
pH With ORP	YSI ProDSS S/N 20G105177
Conductivity & Temperature Probe	YSI ProDSS S/N 20G104783

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	213Y0101	9.13.23	4.03					4.09
7.0	GFS # 1639	2135Y0102	9.24.23	6.98					6.99
10.0	GFS # 1645	213Y0232	8.23.23	9.97					10.01
			Initials & Date:	5-18-22					5-20-22

- Are the calibration values within ±0.10 of the standard? (Y) or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
____ (mV)	GFS	21430187	8-19-22	224.8					227.3
			Initials & Date:	5-18-22					5-20-22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	94.8					95.1
			Initials & Date:	5-18-22					

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within 90-110%? (Y) or N (if no, recalibration is required)

Sonde ID	20G	Project # :
Start Date	5-20-22	22-0530
Reviewed By & Date:	05.23.2022	Site: JR Whiting

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1413	GFS	21250049	7-12-22	1417					1423
			Initials & Date:	CR 5-18-22					LS 5.20.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within range of the standard? (Y) or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.04					0.04
10.0 (± 1.0 NTUs)	Hach 2659949	"	"	N/A	"	"	N/A	"	"
40.0 (± 4.0 NTUs)	Hach 2746356	A1081	Mar 2023	39.17					41.63
			Initials & Date:	CR 5-18-22					LS 5.20.22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS Chemicals			pH 9.0 Check	GFS Chemicals		
pH 7.0	GFS Chemicals						
pH 10.0	GFS Chemicals						
Sp. Conductivity	GFS Chemicals						
40.0 Turbidity	GFS Chemicals						
10.0 Turbidity	GFS Chemicals						

Appendix D
July 2022 Alternate Source Demonstration

Consumers Energy
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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
Former JR Whiting Power Plant, Ponds 1 and 2

Professional Engineer Certification Statement [40 CFR 257.94(e)2]

I hereby certify that the alternative source demonstration presented within this document for the JR Whiting Ponds 1 and 2 CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Harold D. Register

Signature

July 25, 2022

Date of Certification

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

Name

6201056266

Professional Engineer Certification Number

ENCLOSURES

TRC (July 2022). "*Alternate Source Demonstration: April 2022 Detection Monitoring Event, Former JR Whiting Power Plant Ponds 1 and 2, Erie, Michigan*"

1540 Eisenhower Pl.
Ann Arbor, MI 48108
T 734.971.7080
TRCcompanies.com

July 28, 2022

Michelle Marion, Consumers Energy Company
Harold D. Register, Jr., P.E., Consumers Energy Company
Environmental Services – Landfill Operations Compliance
Consumers Energy Company
1945 W. Parnall Road
Jackson, MI 49201

Subject: Alternate Source Demonstration: April 2022 Detection Monitoring Event
Former JR Whiting Power Plant Ponds 1 and 2, Erie, Michigan

Dear Ms. Marion and Mr. Register:

TRC was retained by Consumers Energy Company (Consumers Energy) to conduct routine groundwater monitoring activities at the JR Whiting (JRW) Ponds 1 and 2 coal combustion residual (CCR) unit (closed surface impoundment monitored as Pond 1&2 using a multiunit groundwater monitoring system), located in Erie, Michigan (the Site). Routine groundwater monitoring at the JRW Pond 1&2 is conducted in accordance with the Michigan Department of Environment, Great Lakes, and Energy (EGLE)-approved *JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Power Plant, Erie, Michigan (2020 HMP) (TRC, May 2020 Revision)* and the United States Environmental Protection Agency (USEPA) final rule for the regulation and management of CCR under the Resource Conservation and Recovery Act (RCRA), as amended (the CCR Rule) (USEPA, April 2015).

As discussed in the *First Semiannual 2022 Groundwater Monitoring Report* for the Site (TRC, July 2022), the statistical evaluation of the April 2022 detection monitoring indicator parameters at Pond 1&2 indicated potential statistically significant increases (SSIs) for:

- Boron at JRW-MW-15002 and JRW-MW-15003; and
- Calcium at JRW-MW-15005.

Verification resampling for the April 2022 event was conducted on May 20, 2022. The verification result for calcium at JRW-MW-15005 (120 mg/L) was equal to the prediction limit (PL) of 120 mg/L, consequently the initial potential SSIs for calcium at JRW-MW-15005 was not confirmed. Therefore, in accordance with the *Groundwater Statistical Evaluation Plan – Former JR Whiting Power Plant, Pond 1&2 and Pond 6* (Stats Plan) (TRC, February 2020) and the *USEPA's Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009), the initial exceedance was not statistically significant, and no SSI was recorded for calcium at JRW-MW-15005. The verification results showed boron at JRW-MW-15002 (224 mg/L) was above the PL (220 mg/L) and boron at JRW-MW-15003 (232 mg/L) was above the PL (230 mg/L), which confirmed the initial SSIs (Table 1).

In accordance with §257.94(e)(2) and the HMP, Consumers Energy may demonstrate that a source other than the CCR unit caused the SSIs or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. This Alternate Source Demonstration

(ASD) has been prepared to address the aforementioned boron SSIs identified in the April 2022 detection monitoring event. The results of this ASD show that the boron SSIs at JRW-MW-15002 and JRW-MW-15003 are attributable to natural variability and are not due to a release from Pond 1&2.

Background

The JR Whiting Plant was a coal-fired power generation facility located in Erie, Michigan, on the western shore of Lake Erie (Figure 1). The plant began producing electricity in 1952 from Units 1 and 2, with Unit 3 beginning operation in 1953. The plant ceased operation in April 2016. The JR Whiting Ash Disposal Area is licensed under Michigan Part 115 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended. Figure 1 is a site location map showing the facility and the surrounding area. Site features are shown on Figure 2.

Pond 1&2 is located to the east of the plant, north of the discharge canal, south of Erie Road, and west of Lake Erie and constructed in native clay soil. It was historically used for wet ash sluicing. In 2019, it received its final cover system constructed pursuant to 40 CFR 257.102(a); the Pond 1&2 Closure Construction Quality Assurance (CQA) Plan dated August 31, 2017; the Part 115 Administrative Rules; and Pond 1&2 Closure Plan submitted to the EGLE on December 18, 2017. The closure of Pond 1&2 was certified by the EGLE in a letter dated August 27, 2020.

The subsurface materials encountered at the JR Whiting site are predominately clay-rich till. The surficial CCR fill material is underlain by approximately 40 to 50 feet of laterally extensive clay-rich till that acts as a natural hydraulic barrier across the Site. Limestone bedrock is present beneath the till and is considered the uppermost aquifer at the Site. Groundwater present within the uppermost aquifer is typically encountered at Pond 1&2around 70 to 80 feet below ground surface (ft bgs), approximately 510 to 520 feet above mean sea level (AMSL) in the limestone (beneath the till). The uppermost aquifer is confined and protected from CCR constituents by the 40 to 50 foot-thick overlying clay-rich aquitard which interfaces with the limestone at the elevation range of 510 to 520 ft. Potentiometric surface elevation data from groundwater within the CCR monitoring wells represents the levels in which groundwater rises under hydrostatic pressure within each well and exhibit an extremely low hydraulic gradient across the Site with no consistent or discernible flow direction.

There are minor differences in hydraulic head across the monitoring wells (ranging from zero up to 0.13 feet across Pond 1&2 from event to event from November 2016 through April 2022), indicating that the potentiometric surface is flat the majority of the time. Given that the hydraulic gradient is often so low, groundwater flow across Pond 1&2 is frequently incalculable and often stagnant. The most pronounced groundwater gradient between November 2016 and April 2022 was observed in December 19, 2016, which showed a slight horizontal gradient of approximately 0.00016 to the northwest across Pond 1&2.

As a result of site-specific geologic and hydrogeologic conditions, there is no hydraulic connection between Pond 1&2 and the uppermost aquifer, and downward migration of CCR leachate is not expected. Please refer to the 2017, 2018, 2019, 2020, and 2021 Annual Report for further details regarding site-specific hydrogeology, groundwater potentiometric surface data, and groundwater analytical results (TRC, January 2018, January 2019, January 2020, January 2021, and January 2022). Following the establishment of the HMP, the January 2021 and January 2022 annual reports contain the semiannual monitoring reports submitted to the EGLE.

The detection monitoring well network for Pond 1&2 currently consists of six monitoring wells that are screened in the uppermost aquifer as documented in the October 17, 2017, Groundwater Monitoring System Certification, 257.91(f) (CEC, 2017). The monitoring well locations are shown in Figure 2.

Alternate Source Demonstration

As discussed above, verification resampling for boron at JRW-MW-15002 and JRW-MW-15003, and for calcium at JRW-MW-15005, was performed as recommended per the Stats Plan and the Unified Guidance, to achieve performance standards as specified in the HMP and by §257.93(g) in the CCR Rule. The May 2022 verification resampling confirmed the boron exceedances at JRW-MW-15002 and JRW-MW-15003 (Table 1). The following discussion presents the ASD for the confirmed prediction limit exceedances.

Boron at JRW-MW-15002 and JRW-MW-15005

The boron SSIs in the groundwater at JRW-MW-15002 and JRW-MW-15003, shown on Table 1, are due to natural variation groundwater quality and not the release of CCR constituents from Pond 1&2. The lines of evidence provided in support of this conclusion are as follows:

- **Limited background sampling timeline to capture natural variability** – As mentioned above, potentiometric data show that groundwater flow is very low and often stagnant with no apparent groundwater flow direction. Due to the limitations on CCR Rule implementation timelines, the background data collection monitoring events for JR Whiting were timed at a frequency of one to two months apart to ensure the collection of the eight background samples prior to October 17, 2017. Background data are included in the 2017 Annual Groundwater Monitoring Report (TRC, January 2018). Additional semiannual data were incorporated into the background dataset in March 2019, however, given that groundwater flow is so low with no consistent flow direction, temporal variability is still limited.

  Conservatively high groundwater flow rates of 1.8 ft/yr to 12.8 ft/yr have been estimated using the maximum head difference in the monitoring wells each semiannual sampling event performed in November 2017 through October 2021 even though there was no clear discernable flow direction. As discussed in the semiannual reports, the potentiometric surface elevation is generally flat across the pond the majority of the time. Based on this frequency and the general lack of groundwater flow at the Site, limited temporal variability is represented in the background data set at this Site. The short duration of the background sampling events limits the ability of the statistical analysis to capture the natural temporal trends in the groundwater quality at JRW in addition to a relatively short period of semiannual groundwater monitoring (5 years) when considering the low groundwater flow rates. Using the aforementioned conservatively high groundwater flow rates, and assuming groundwater was moving in a consistent direction (although it is not), indicates that groundwater travel within those five years potentially ranged from 9 ft to 64 ft. Given that the flow direction is non-existent or inconsistent, the travel time is actually much lower.

  This limited temporal variability can only be corrected with the collection of additional groundwater data, and the inclusion of the additional data in the background data set updated in the future, as long as data continue to show no impacts from the CCR unit.

- **Hydraulic isolation and time of travel analysis** – The clay formation immediately beneath Pond 1&2 provides a natural hydraulic barrier that prevents vertical migration of CCR constituents to the underlying limestone aquifer. Permeameter tests completed on eight samples of the Site clay produced hydraulic conductivity values ranging from 5.5 x 10^{-9} cm/s to 2.23 x 10^{-8} cm/s (TRC,

December 2018). The vertical extent of the clay layer beneath the CCR unit is shown in cross sections A-A' and C-C' respectively (Figures 3 through 5). As presented in detail in the Natural Clay Liner Equivalency Evaluation Report prepared by TRC, the conservatively calculated time of travel for water from the base of the JRW Pond 1&2 to migrate through approximately 35 feet of clay to the underlying uppermost aquifer, is approximately 1,900 years (TRC, December 2018). The JRW Power Plant operated for 64 years between 1952 and ended in 2016. Based on the calculated travel time of 1,900 years and the lack of hydraulic connection between Pond 1&2 and the uppermost aquifer, leachate could not have migrated to the upper aquifer within the operational or post-operational period.

- **Pond 1&2 is capped and closed** – Pond 1&2 has been closed in place with final cover established in 2019, the cap is maintained to eliminate potential for future migration from infiltration within the Pond 1&2 footprint and groundwater detection monitoring continues to be performed post-closure. As detailed in the Consumers Energy provided notice of the intent to initiate closure of Pond 1&2 on November 14, 2017. CCR was placed to design grade and the pond was closed with an engineered cap in 2019 and documented in the J.R. Whiting Generating Facility, Ponds 1 and 2 Construction Documentation Report (Golder, July 2020). The closure was performed in general accordance with the EGLE approved J.R. Whiting Generating Facility, Ponds 1-2 Closure Plan dated December 18, 2017 (Golder, December 2017) and certified closed by the EGLE on August 27, 2020. Although the underlying native clay provides a natural hydraulic barrier to prevent downward migration from leachate within the CCR unit, the closure of Pond 1&2 further eliminates that potential.
- **Spatial variability in groundwater quality** – Boron concentrations observed at JRW-MW-15002 and JRW-MW-15003 are within the historical ranges at Pond 1&2. The boron concentrations observed in the Pond 1&2 well network between 2017 and 2022 ranged from 166 mg/L to 282 mg/L. The boron concentrations observed at JRW-MW-15002 (224 mg/L) and JRW-MW-15003 (232 mg/L) during the May 2022 verification event are only slightly above their respective prediction limits and are well within the range of 163 mg/L to 282 mg/L observed across the entire monitoring network (Figure 6 and Figure 7).
- **Temporal variability in groundwater quality** – Natural variability in groundwater concentrations is expected due to heterogeneity that occurs within an aquifer system over time. Variability often occurs seasonally or periodically and can occur due to a variety of reasons such as variations in groundwater recharge and interactions between bedrock material and groundwater. Temporal variability has been observed historically in groundwater at the JRW Site, including the boron dataset collected across the Pond 1&2 monitoring well network. A time-series plot is included as Figure 7 that illustrates this variability in boron concentrations measured over time since groundwater monitoring began in 2016 and shows that the variability is generally consistent across the entire Pond 1&2 well network. Periods of increasing concentrations are followed by periods of decreasing concentrations that occur similarly at all of the monitoring wells with no apparent trend of overall increasing or decreasing concentration over time (Figure 7), indicating a natural change over time. This periodic change occurs beyond the Pond 1&2 monitoring network. As shown on Figure 8, a similar change in boron over time is observed at the Pond 6 monitoring well network located to the north of Pond 1&2 (Figure 2). The fact that the boron concentrations are changing consistently across the Site and are within the range of concentrations historically observed across the site, indicates natural variability as the reason for the exceedances of boron at JRW-MW-15002 and JRW-MW-15003.
- **No other SSIs identified** – All other detection monitoring constituents in groundwater at JRW-MW-15002 and JRW-MW-15003, and the other remaining Pond 1&2 wells, were below or within their

respective prediction limits (Table 1). The lack of SSIs observed for other detection monitoring constituents further demonstrates that the April 2022 boron concentrations observed at JRW-MW-15002 and JRW-MW-15003 are not related to the CCR unit and the aquifer is unaffected from Pond 1&2 leachate.

Conclusions and Recommendations

Based on the multiple lines of evidence presented above, the boron SSIs observed at JRW-MW-15002 and JRW-MW-15003 in the April 2022 semiannual sampling event cannot be attributed to the JRW Pond 1&2 CCR unit. The information provided in this report serves as the ASD for Pond 1&2, was prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule and demonstrates that the boron SSIs identified during the semiannual detection monitoring event performed in April 2022 are not due to a release of CCR leachate into the groundwater. Therefore, based on the information provided in this ASD, CEC will continue detection monitoring as per 40 CFR 257.94 at the Pond 1&2 CCR unit.

In addition, it is recommended that the statistical limits for the Appendix III parameters at the JRW Pond 1 & 2 monitoring well network be updated to include additional semiannual monitoring data and incorporate the additional temporal variability observed since 2019.

Sincerely,

TRC

Sarah B. Holmstrom, P.G.
Project Manager/Sr. Hydrogeologist

Brian Yelen
Project Geologist

Attachments

Table 1	Comparison of Groundwater Monitoring Parameter Results to Background Limits – April and May 2022
Figure 1	Site Location Map
Figure 2	Site Plan with CCR Monitoring Well Locations
Figure 3	Site Plan with Monitoring Well Locations
Figure 4	Generalized Geologic Cross Section A-A’
Figure 5	Generalized Geologic Cross Sections B-B’ and C-C’
Figure 6	Boron Time-Series Plot – JR Whiting Monitoring Wells: JHW-MW-15002 and JRW-MW-15003
Figure 7	Boron Time Series Plot – JR Whiting Pond 1 & 2
Figure 8	Boron Time-Series Plot – JR Whiting Pond 1 & 2 and Pond 6
Attachment 1	References

Tables

Table 1
Comparison of Groundwater Monitoring Parameter Results to Background Limits – April and May 2022
JR Whiting Pond 1 & 2
Erie, Michigan

Sample Location:		JRW-MW-15001		JRW-MW-15002			JRW-MW-15003			JRW-MW-15004		JRW-MW-15005			JRW-MW-15006	
Sample Date:		4/6/2022	PL	4/6/2022	5/20/2022	PL	4/6/2022	5/20/2022	PL	4/6/2022	PL	4/6/2022	5/20/2022	PL	4/6/2022	PL
Constituent	Unit	Data		Data			Data			Data		Data			Data	
Appendix III																
Boron	ug/L	224	240	**235**	**224**	220	**251**	**232**	230	260	270	213	--	270	242	250
Calcium	mg/L	149	180	132	--	180	123	--	160	129	140	**122**	120	120	134	140
Chloride	mg/L	43.9	55	39.5	--	56	41.7	--	55	44.7	56	31.1	--	46	41.4	53
Fluoride	ug/L	< 1,000	1,600	< 1,000	--	1,900	< 1,000	--	1,800	< 1,000	1,800	< 1,000	--	1,700	< 1,000	1,700
pH, Field	su	7.5	6.8 - 8.2	7.6	--	7.2 - 7.9	7.7	--	7.3 - 8.3	7.5	7.0 - 8.0	7.6	--	7.3 - 8.6	7.6	7.0 - 9.0
Sulfate	mg/L	374	470	399	--	500	341	--	440	326	390	295	--	350	336	410
Total Dissolved Solids	mg/L	783	1,000	786	--	1,100	702	--	940	674	880	618	--	840	699	920
Part 115 Parameters																
Iron	ug/L	1,110	n<8	779	--	n<8	526	--	n<8	104	n<8	419	--	n<8	450	n<8

Notes:
ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
All metals were analyzed as total unless otherwise specified.
Bold font indicates an exceedance of the Prediction Limit (PL).
RESULT Shading and bold font indicates a confirmed exceedance of the Prediction Limit (PL).

Figures

BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 3,000 6,000 FEET

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com
TRC - GIS

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	A. ADAIR
CHECKED BY:	B. YELEN
APPROVED BY:	S. HOLMSTROM
DATE:	JULY 2022
PROJ. NO.:	464089
FILE:	464089-001-001slm.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\464089-001-001slm.mxd -- Saved By: AADAIR on 6/7/2022, 15:05:07 PM

LEGEND

- MONITORING WELL (STATIC WATER LEVEL ONLY)
- CCR UNIT MONITORING WELL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 03/2021.
2. STATIC WATER ONLY WELL LOCATIONS SURVEYED BY SHERIDAN SURVEYING CO. ON 11/19/2015.
3. PONDS 1 & 2 WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 11/27 /2019.

N

0 500 1,000 Feet

1 " = 500 '

1:6,000

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE PLAN
WITH CCR MONITORING WELL LOCATIONS

DRAWN BY:	A. ADAIR	PROJ NO.:	464089
CHECKED BY:	B. YELEN		
APPROVED BY:	S. HOLMSTROM		**FIGURE 2**
DATE:	JULY 2022		

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FILE NO.: 464089-001-002_SP.mxd

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Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

LEGEND

- MONITORING WELL (STATIC WATER LEVEL ONLY)
- CCR UNIT MONITORING WELL
- CROSS SECTION LOCATION

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, 4/12/2017.
2. WELL LOCATIONS SURVEYED BY SHERIDAN SURVEYING CO. ON 11/19/2015 AND 11/30/2016.

N

0 500 1,000 Feet

1 " = 500 '

1:6,000

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE PLAN WITH MONITORING WELL LOCATIONS

DRAWN BY:	S. MAJOR	PROJ NO.:	332751-001
CHECKED BY:	S. HOLMSTROM		
APPROVED BY:	V. BUENING		**FIGURE 3**
DATE:	MAY 2019		

TRC
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Phone: 734.971.7080
www.trcsolutions.com

FILE NO.: 332751-001-005.mxd

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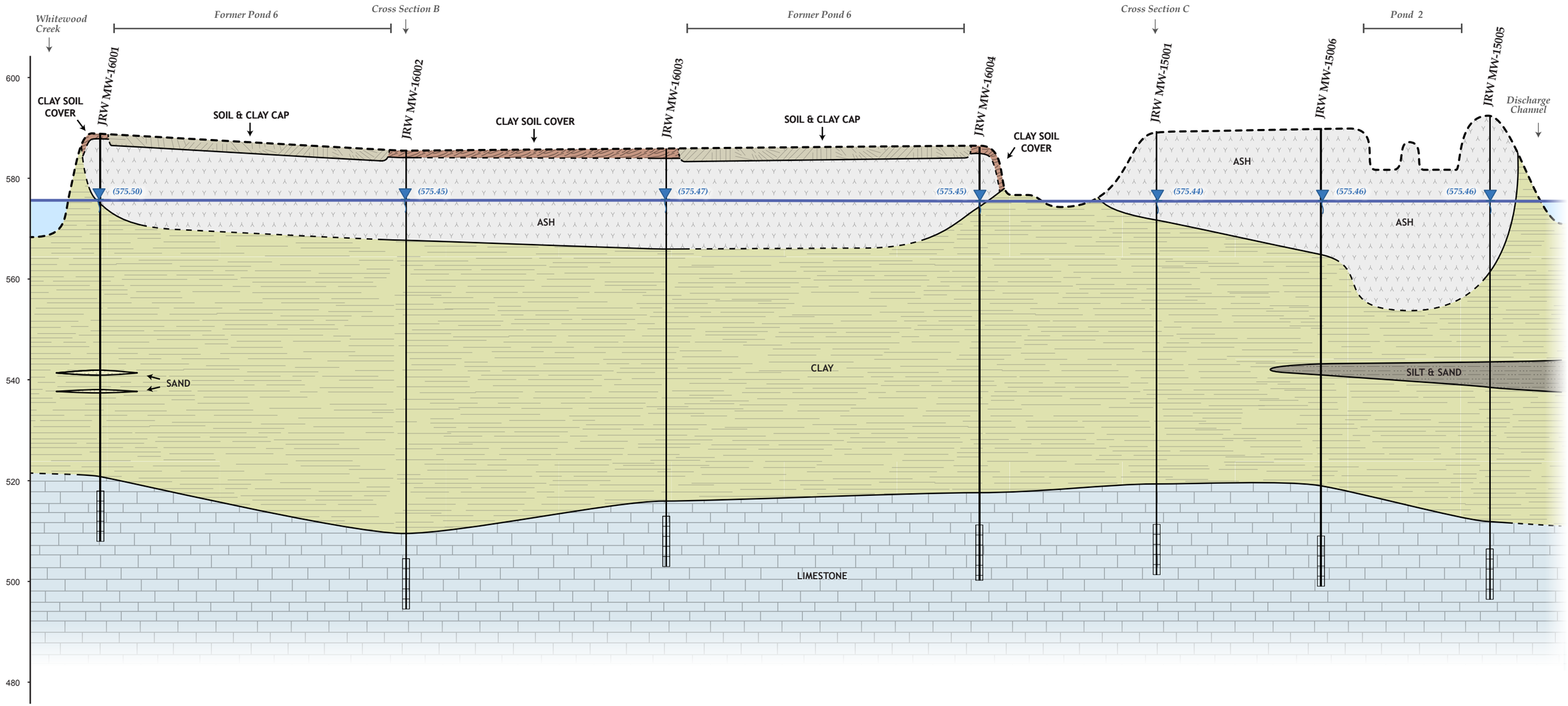
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

TRC - GIS

Generalized Geologic Cross Section

A
(North)

A′
(South)



LEGEND

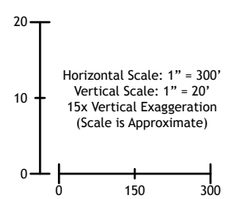
- GROUND SURFACE PROFILE, DASHED WHERE INFERRED
- STRATIGRAPHIC BOUNDARY, DASHED WHERE INFERRED
- APPROXIMATE CONFINED GROUNDWATER POTENTIOMETRIC ELEVATION (JULY 31, 2017)

SOIL UNIT LITHOLOGY

- SOIL & CLAY CAP
- CLAY SOIL COVER
- ASH
- CLAY
- LIMESTONE
- SILT & SAND
- SAND
- WELL BOREHOLE
- WELL SCREEN

NOTES

1. FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.
2. CROSS SECTION BASED UPON INFORMATION FROM ASH POND MATERIAL CHARACTERIZATION (GOLDER, 2016), SUMMARY OF MONITORING WELL DESIGN, INSTALLATION, AND DEVELOPMENT (ARCADIS, 2016), AND 2016 MONITORING WELL DESIGN, INSTALLATION, DEVELOPMENT, AND DECOMISSIONING (TRC, 2016).



PROJECT:
CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:
GENERALIZED GEOLOGIC CROSS SECTION A-A'

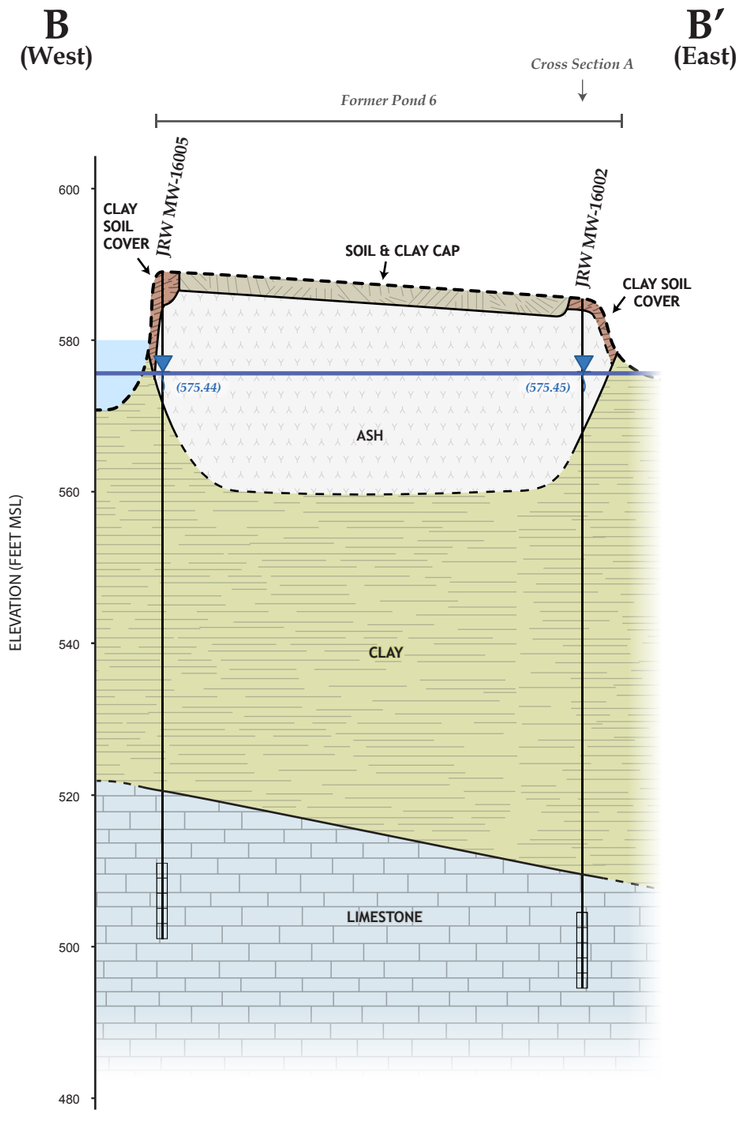
DRAWN BY:	S.MAJOR	PROJ NO.:	332751
CHECKED BY:	S. HOLMSTROM		
APPROVED BY:	V. BUENING		**FIGURE 4**
DATE:	MAY 2019		

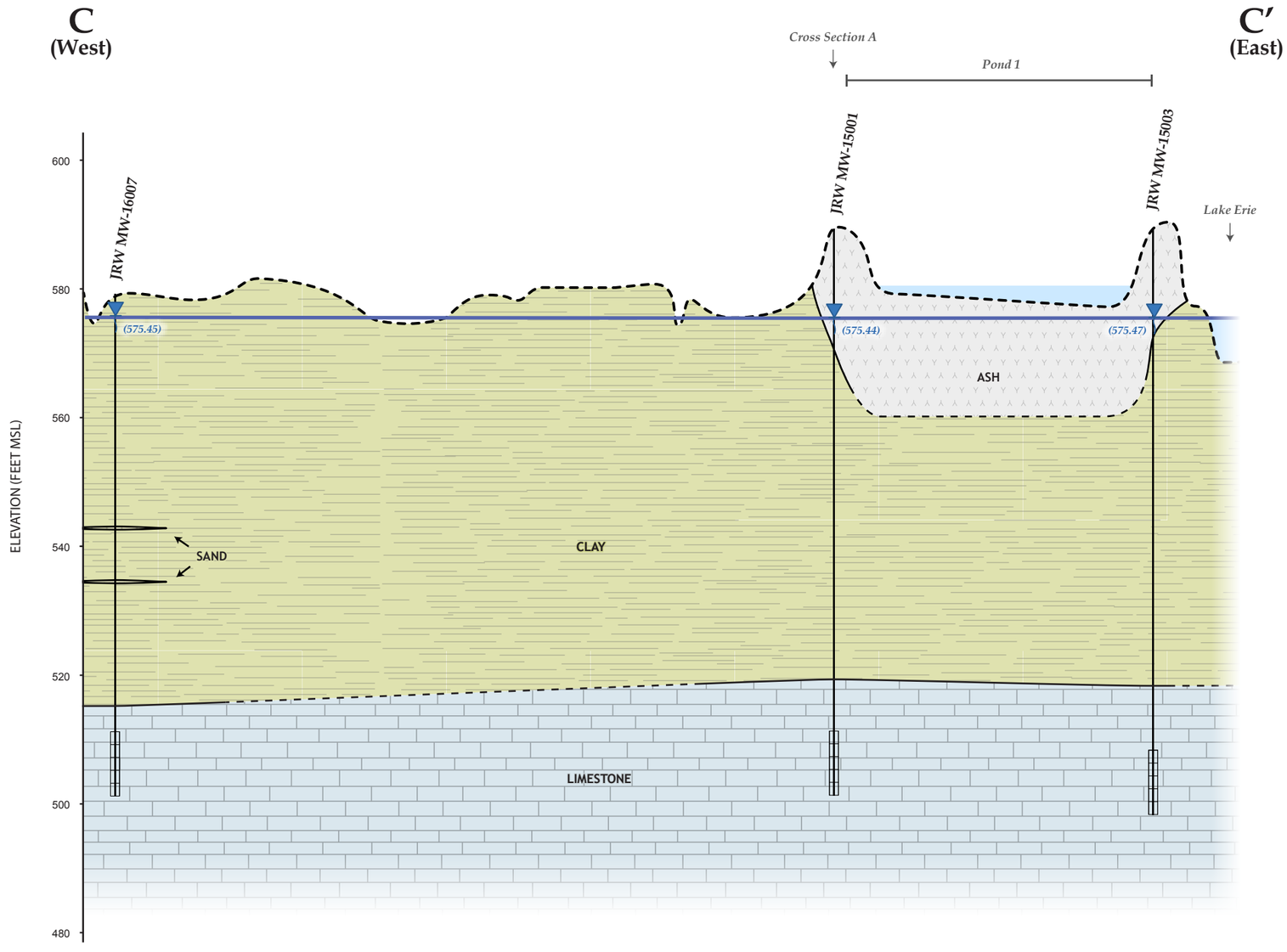
TRC
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080

FILE NO.: 332751-001-ai01

File Path: E:\WI_DOT\2015_229576\A\l269767-004-ai01.ai

Generalized Geologic Cross Sections





LEGEND

- GROUND SURFACE PROFILE, DASHED WHERE INFERRED
- STRATIGRAPHIC BOUNDARY, DASHED WHERE INFERRED
- APPROXIMATE CONFINED GROUNDWATER POTENTIOMETRIC ELEVATION (JULY 31, 2017)

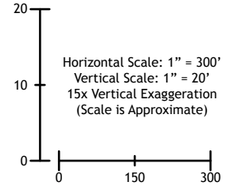
SOIL UNIT LITHOLOGY

- SOIL & CLAY CAP
- CLAY SOIL COVER
- ASH
- CLAY
- LIMESTONE
- SAND

- WELL BOREHOLE
- WELL SCREEN

NOTES

1. FEATURE LOCATIONS AND SCALE ARE APPROXIMATE.
2. CROSS SECTION BASED UPON INFORMATION FROM ASH POND MATERIAL CHARACTERIZATION (GOLDER, 2016), SUMMARY OF MONITORING WELL DESIGN, INSTALLATION, AND DEVELOPMENT (ARCADIS, 2016), AND 2016 MONITORING WELL DESIGN, INSTALLATION, DEVELOPMENT, AND DECOMISSIONING (TRC, 2016).



PROJECT:
CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:
GENERALIZED GEOLOGIC CROSS SECTIONS B-B' AND C-C'

DRAWN BY:	S.MAJOR	PROJ NO.:	332751
CHECKED BY:	S. HOLMSTROM		
APPROVED BY:	V. BUENING		**FIGURE 5**
DATE:	MAY 2019		

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080

FILE NO.: 322751-001-ai02.ai

File Path: E:\WI_DOT\2015_229576\AI\322751-001-ai02.ai

Figure 6
Boron Time-Series Plot
JR Whiting Monitoring Wells: JRW-MW-15002 and JRW-MW-15003

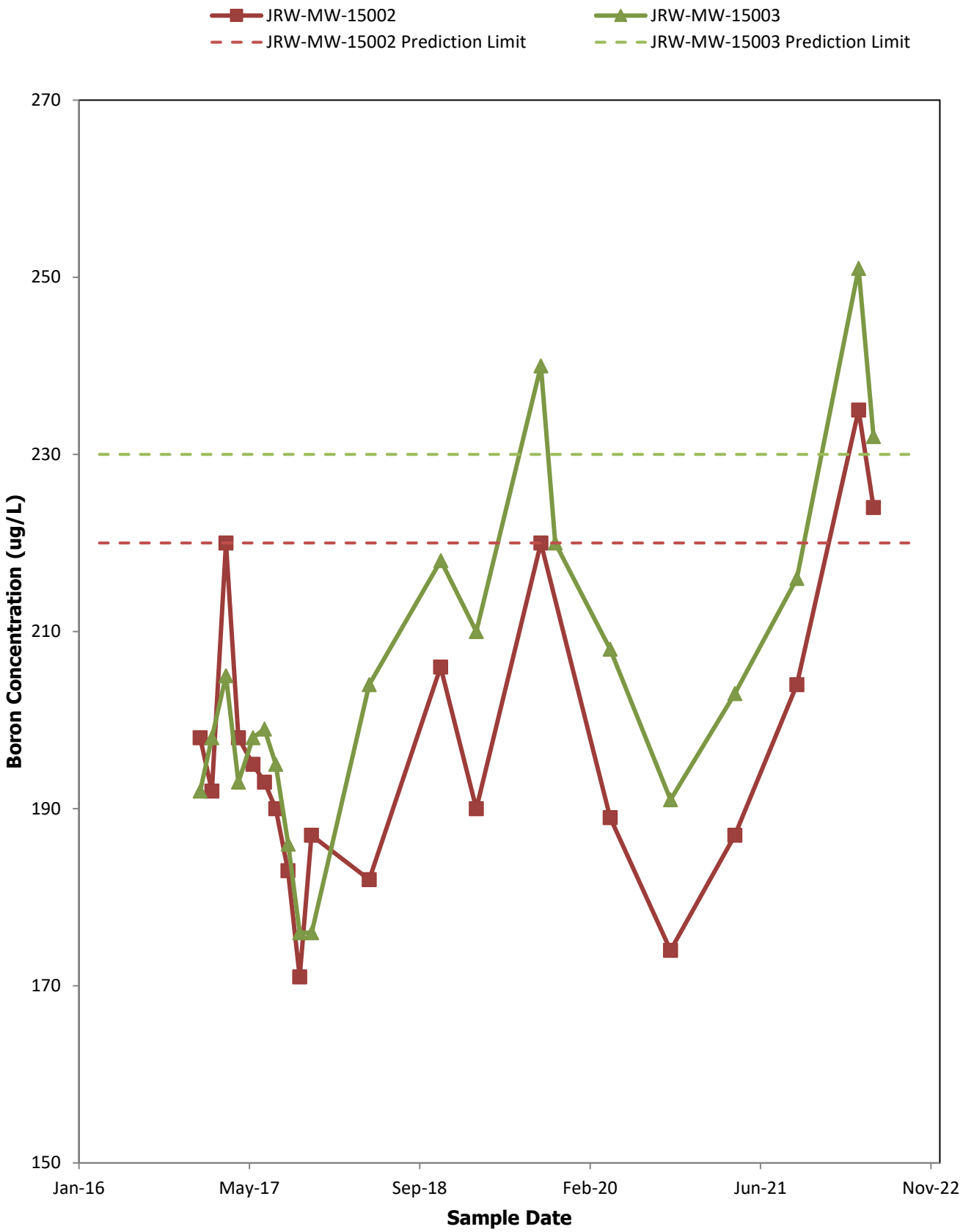


Figure 7
Boron Time-Series Plot
JR Whiting Pond 1 & 2

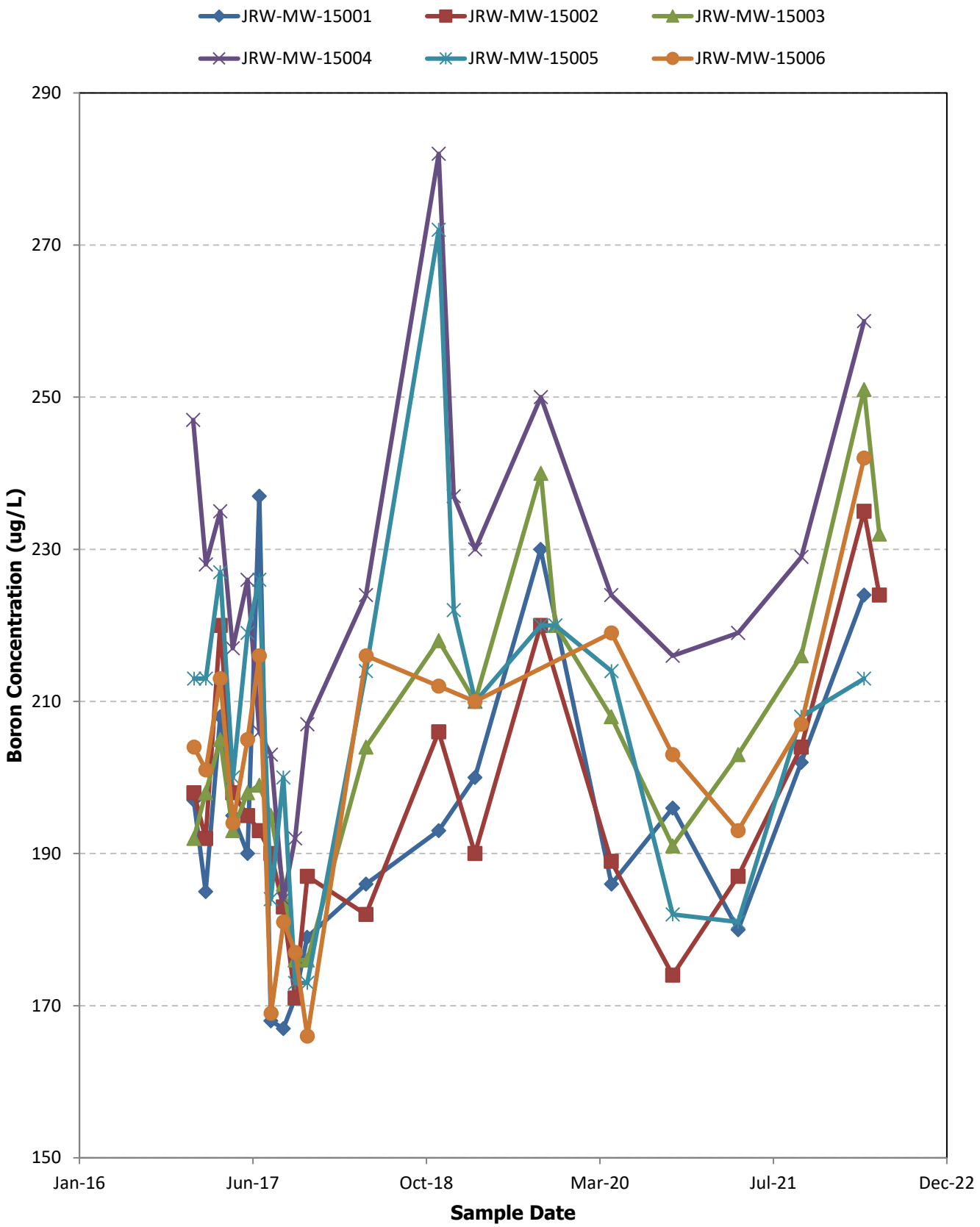
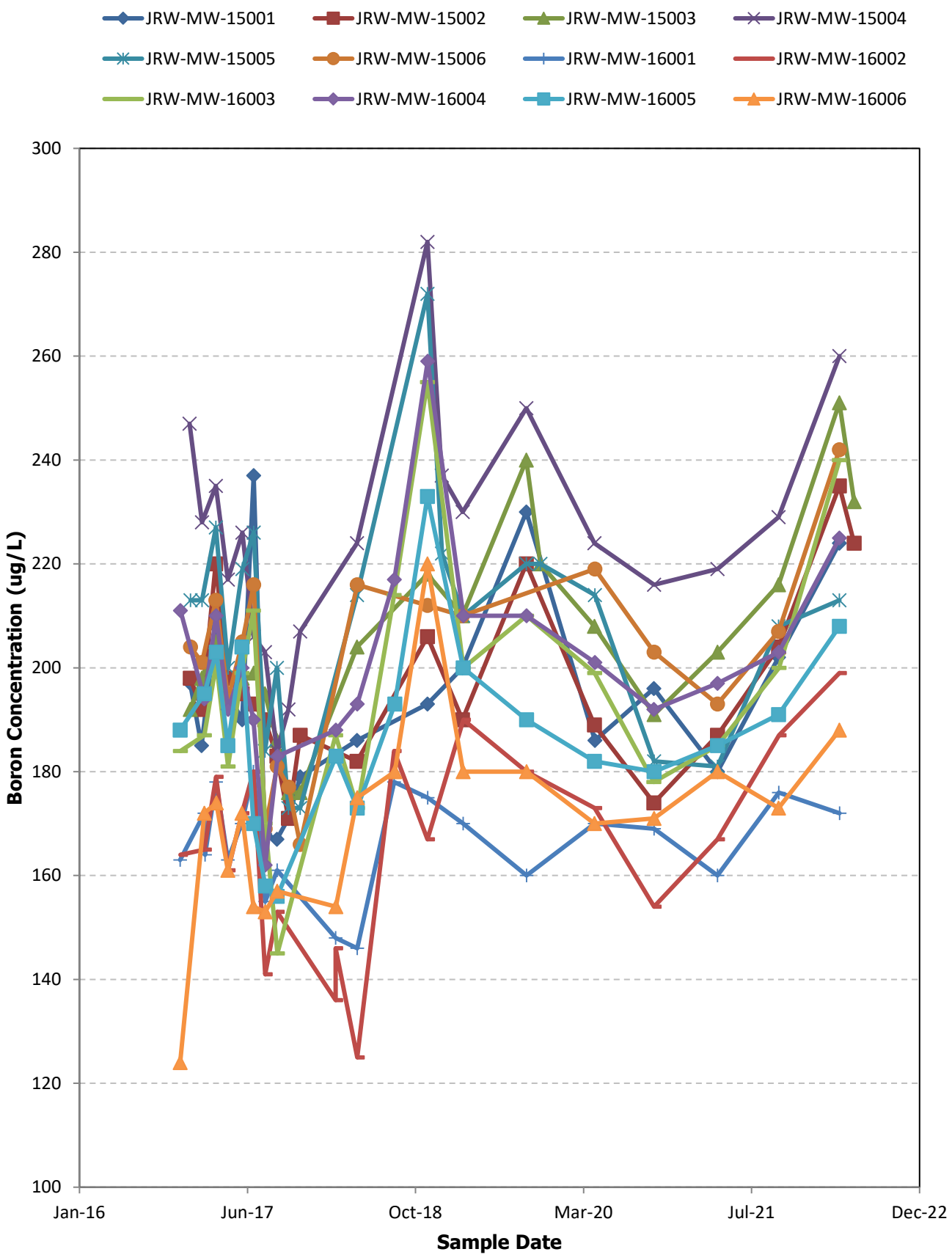


Figure 8
Boron Time-Series Plot
JR Whiting Pond 1 & 2 and Pond 6



Attachment 1
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Appendix B
Second Semiannual Monitoring Report

Consumers Energy
Count on Us®

January 30, 2023

Brett Coulter, CPG, District Geologist
EGLE, Materials Management Division
State Office Building
301 East Louis Glick Highway
Jackson, MI 49201

TRANSMITTAL OF GROUNDWATER MONITORING RESULTS FOR JR WHITING SOLID WASTE DISPOSAL AREA

Dear Mr. Coulter,

Please find attached the Second Semiannual 2022 Groundwater Monitoring Report for the JR Whiting Solid Waste Disposal Area, Facility ID 397664, prepared pursuant to the May 2020 Hydrogeological Monitoring Plan.

JR Whiting was following the groundwater monitoring waiver approved on September 2, 2009 until the federal Resource Conservation and Recovery Act (RCRA) coal combustion residuals (CCR) rule required groundwater monitoring at JR Whiting Pond 1&2 and then at Pond 6, beginning around 2016. Since then, in December 2018, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Project Act, also known as Part 115 of PA 451 of 1994, as amended, to incorporate requirements of the federal CCR Rule. In 2019, Consumers Energy submitted a revised JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Plant, Erie, Michigan (2020 HMP) (TRC, May 2020 Revision) that was finalized and approved by the Michigan Department of Environment, Great Lakes, and Energy in May 2020. The revised HMP harmonizes both the CCR Rule and state of Michigan requirements. This submittal was prepared in accordance with the July 5, 2013 OWMRP-115-29 communication under the revised HMP.

Please contact me if you have any questions regarding this transmittal.

Sincerely,

Michelle A. Marion
Sr. Engineer, Consumers Energy Environmental Services
Phone: (517) 937-9407
Email: michelle.marion@cmsenergy.com

cc Larry Bean, EGLE (via email)
Gary Schwerin, EGLE (via email)

Second Semiannual 2022 Groundwater Monitoring Report

Former JR Whiting Power Plant Pond 1&2 and Pond 6

Erie, Michigan

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Prepared For:

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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 257.90-98) apply to the Consumers Energy Company (Consumers Energy) Ponds 1 and 2 (closed surface impoundment monitored as Pond 1&2 using a multiunit groundwater monitoring system) and Pond 6 (closed inactive surface impoundment) at the former JR Whiting (JRW) Power Plant Site (the Site). Prior to the CCR Rule, from about 2009 to 2016, JR Whiting followed the approved groundwater monitoring waiver.

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. On August 8, 2019 Consumers Energy submitted a revised *JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Power Plant, Erie, Michigan* (2020 HMP) (TRC, May 2020 Revision) to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to comply with the requirements of Part 115, Rule 299.4905, and the CCR Rule. The HMP was approved by the EGLE on May 11, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This JR Whiting Second Semiannual 2022 Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to present groundwater monitoring data collected from the JR Whiting Pond 1&2 and Pond 6 during the second calendar quarter of 2022. This report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the July 5, 2013 Michigan Department of Environmental Quality - Office of Waste Management and Radiological Protection (MDEQ-OWMRP), now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, Format for Solid Waste Disposal Monitoring Submittals. All references herein to the EGLE are inclusive of the MDEQ. Groundwater sampling, analysis, and information contained in this report was prepared in adherence to the 2020 HMP.

1.2 Program Summary

Historically groundwater monitoring at JRW was performed under the HMP last revised on November 26, 1997 until the groundwater monitoring waiver was approved on September 2, 2009. It was then performed pursuant to the CCR Rule until implementation of the 2020 HMP, at which time monitoring began to be conducted in accordance with both regulatory programs. In the *First Semiannual 2021 Groundwater Monitoring Report* for the JRW Pond 1&2 and Pond 6 (First Semiannual 2021 Report) (TRC, July 2021), Consumers Energy reported that no potential statistically significant increases (SSIs) were noted during the first 2022 semiannual detection monitoring event. Therefore, Consumers Energy continued detection monitoring in

the second half of 2022 at Pond 1&2 and Pond 6 pursuant to §257.94 of the CCR Rule, and the HMP.

This Second Semiannual 2022 Report presents the monitoring results and the statistical evaluation of the detection monitoring constituents (Section 11511a(3)(c) of Part 115) for the October 2022 semiannual groundwater monitoring event for Pond 1&2 and Pond 6. Detection monitoring was performed in accordance with the 2020 HMP. As part of the statistical evaluation, the data collected during detection monitoring events are evaluated to identify SSIs of detection monitoring constituents compared to background levels.

1.3 Site Overview

The JR Whiting Plant was a coal-fired power generation facility located in Erie, Michigan, on the western shore of Lake Erie (Figure 1). The plant began producing electricity in 1952 from Units 1 and 2, with Unit 3 beginning operation in 1953. The plant ceased operation in April 2016. Figure 1 is the site location map showing the facility and the surrounding area. Site features are shown on Figure 2.

The JR Whiting Ash Disposal Area is licensed under Michigan Part 115 of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended.

Pond 1&2 is located to the east of the plant, north of the discharge canal, south of Erie Road, and west of Lake Erie and constructed in native clay soil. It was historically used for wet ash sluicing. In 2019, it received its final cover system constructed pursuant to 40 CFR 257.102(a); the Pond 1&2 Closure Construction Quality Assurance (CQA) Plan dated August 31, 2017; the Part 115 Administrative Rules; and Pond 1&2 Closure Plan submitted to the EGLE on December 18, 2017. The closure of Pond 1&2 was certified by the EGLE in a letter dated August 27, 2020.

Pond 6 is located to the north of the plant and was constructed in native clay soil. It was an inactive surface impoundment at the time the CCR Rule became effective on October 19, 2015 and was capped with final cover certified pursuant to the CCR Rule on December 5, 2017 and certified by the EGLE on August 24, 2018.

1.4 Geology/Hydrogeology

Pond 1&2 and Pond 6 are located adjacent to Lake Erie. The subsurface materials encountered at the JR Whiting site are predominately clay-rich till. The surficial CCR fill material is underlain by approximately 40 to 50 feet of laterally extensive clay-rich till that acts as a natural hydraulic barrier across the site. Limestone bedrock is present beneath the till and is considered the uppermost aquifer at the site.

Groundwater present within the uppermost aquifer is typically encountered at Pond 1&2 and Pond 6 around 70 to 80 feet below ground surface (ft bgs), approximately 510 to 520 feet above mean sea level (AMSL), in the limestone (beneath the till). The uppermost aquifer is confined and protected from CCR constituents by the 40 to 50 foot-thick overlying clay-rich aquitard which interfaces with the limestone at the elevation range of 510 to 520 ft. Potentiometric

surface elevation data from groundwater within the CCR monitoring wells represents the levels in which groundwater rises under hydrostatic pressure within each well and exhibit an extremely low hydraulic gradient across the site with no consistent or discernible flow direction.

2.0 Groundwater Monitoring

2.1 Monitoring Well Network

A groundwater monitoring system has been established for Pond 1&2 and Pond 6 for the purpose of detection monitoring. The detection monitoring well network for Pond 1&2 and Pond 6 currently consists of six monitoring wells for each CCR unit that are screened in the uppermost aquifer. Monitoring well locations are shown on Figure 2.

As discussed in the HMP, intrawell statistical methods for JR Whiting were selected based on the geology and hydrogeology at the Site (primarily the presence of clay/hydraulic barrier, no apparent flow direction and lack of flow potential across the aquifer), in addition to other supporting lines of evidence that the aquifer is unaffected by the CCR unit (such as the consistency in concentrations of water quality data and similarities in concentrations in background and downgradient wells).

An intrawell statistical approach requires that each of the downgradient wells doubles as the background and compliance well, where data from each individual well during a detection monitoring event is compared to a statistical limit developed using the background dataset from that same well. Monitoring wells JRW-MW-15001 through JRW-MW-15006 are located around the perimeter of Pond 1&2 and monitoring wells JRW-MW-16001 through JRW-MW-16006 are located around the perimeter of the JRW Pond 6. These monitoring wells provide data on both background and downgradient groundwater quality that has not been affected by the CCR unit (a total of six background/downgradient monitoring wells for each pond).

As shown on Figure 2, monitoring wells JRW-MW-16007 through JRW-MW-16009 are used for water level measurements only. These wells were initially installed as potential background monitoring wells during the initial stages of characterizing the site. However, based on further hydrogeological characterization of the uppermost aquifer, an intrawell statistical approach was selected which does not rely on JRW-MW-16007 through JRW-MW-16009 for statistical evaluation.

No monitoring wells have been installed or decommissioned since the previous monitoring event.

2.2 October 2022 Groundwater Monitoring

Consumers Energy Laboratory Services personnel performed gauging and sampling of monitoring wells associated with Pond 1&2 and Pond 6 on October 6, 2022. Groundwater monitoring was performed in accordance with the HMP, with the exception of pH at JHC-MW-16001 as detailed below in Section 2.2.1. Groundwater samples collected during the October 2022 event were submitted to Consumers Energy Laboratory Services in Jackson, Michigan, for analysis of the following metals and inorganic indicator constituents:

Section 11511a(3)(c) – Detection Monitoring Constituents
Boron
Calcium
Chloride
Fluoride
Iron
pH
Sulfate
Total Dissolved Solids (TDS)

Static water level measurements were collected at all locations after equilibration to atmospheric pressure. The depth to water was measured according to ASTM D 4750, "Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well" and recorded to the nearest 0.01 foot. Static water elevation data are summarized in Table 1.

Groundwater samples were collected using a peristaltic pump or submersible pump in accordance with low flow sampling protocol and were not field filtered to allow for total metals analysis. Groundwater field parameters included dissolved oxygen, oxidation reduction potential, pH, specific conductivity, temperature, and turbidity and are summarized on Table 2. All samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Consumers Energy followed chain of custody procedures to document the sample handling.

Consumers Energy collected quality assurance/quality control (QA/QC) samples from both CCR units, Pond 1&2 and Pond 6, during the October 2022 groundwater sampling event. The QA/QC samples per CCR unit consisted of one field blank, one equipment blank, one field duplicate (JRW-MW-15002 at Pond 1&2 and JHC-MW-16005 at Pond 6), and one field matrix spike/matrix spike duplicate (MS/MSD) sample collected from JRW-MW-15006 at Pond 1&2, and JHC-MW-16003 at Pond 6.

Groundwater analytical results from the second semiannual 2022 monitoring event are summarized in Table 3 (Pond 1&2) and Table 4 (Pond 6). The laboratory analytical reports are included in Appendix B. Field records are included in Appendix C.

2.2.1 Data Quality Review

Data from each round 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 CCR monitoring program with the exception of pH at JHC-MW-16001 during the October 2022 event. The procedures used to collect the pH data at JHC-MW-16001 did not meet data quality objectives,

and data usability was affected. A resample was collected in November 2022 during which quality objectives were met. Therefore, November 2022 pH data were used for purposes of detection monitoring during the second semiannual 2022 monitoring event. Data quality reviews are summarized in Appendix A.

2.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the background sampling events showed that the hydraulic gradient for groundwater within the uppermost aquifer is often so low, groundwater flow across Pond 1&2 and Pond 6 is frequently incalculable and often stagnant.

There are minor differences in hydraulic head across the monitoring wells (ranging from zero up to 0.15 feet across Pond 1&2 and up to 0.24 feet across Pond 6 from event to event from November 2016 through October 2022), indicating that the potentiometric surface is flat the majority of the time. In the few instances since November 2016 where a slight gradient was observed and calculable, the direction of the flow potential is highly variable event to event and has shown flow directions slightly to the northwest, east, and northeast from Pond 1&2 and slightly to the south, west, and northeast from Pond 6.

The most pronounced groundwater gradient between November 2016 and October 2022 at Pond 1&2 was observed on December 19, 2016, which showed a slight horizontal gradient of approximately 0.00016 to the northwest across Pond 1&2. For Pond 6, the most pronounced potentiometric head differential of 0.24 feet was observed on February 28, 2018 between JRW-MW-16001 on the north edge of Pond 6 and JRW-MW-16004 on the south edge of the Pond 6 CCR unit. Although, when considering the potentiometric surface elevation data from all of the Pond 6 CCR unit wells, the general groundwater flow direction inferred across the pond at that time is to the southwest, in order to be conservative, the maximum head difference was used to calculate the maximum groundwater flow velocity at the Pond 6 CCR unit throughout the background monitoring period. This results in a very slight horizontal gradient of approximately 0.000099 ft/ft to the south.

Pond 1&2

Although there was no clear flow direction when looking at water levels across the Pond 1&2 well network, the maximum groundwater gradient inferred on October 6, 2022 was calculated using well pair JRW-MW-15001/JRW-MW-15004. The head difference across Pond 1&2 ranged from 0.01 to 0.04 feet between monitoring wells, with the maximum head difference showing a slight horizontal gradient of approximately 0.000043 ft/ft. Using the highest hydraulic conductivity measured at the Pond 1&2 monitoring wells of 20 feet/day (ARCADIS, 2016), and an assumed effective porosity of 0.1, this results in a maximum inferred groundwater flow rate of approximately 0.0086 feet/day (approximately 3.1 feet/year). However, the actual gradient is much lower when considering the rest of the monitoring wells across Pond 1&2 and the lack of discernable flow direction. The Pond 1&2 groundwater potentiometric surface elevations measured across the Site during the October 2022 sampling event are provided on Table 1 and are summarized in plan view on Figure 3.

The extremely low gradient and lack of general flow direction is similar to that identified in previous monitoring rounds (since the background sampling events commenced in December 2016) and continues to demonstrate that the downgradient compliance wells are appropriately positioned to detect the presence of detection monitoring constituents that could potentially migrate from Pond 1&2.

Pond 6

Although there was no clear flow direction when looking at water levels across the Pond 6 well network, the maximum groundwater gradient inferred on October 6, 2022 was calculated using well pair JRW-MW-16006/JRW-MW-16005. The head difference across Pond 6 ranged from 0.01 to 0.05 feet between monitoring wells, with the maximum head difference showing a slight horizontal gradient of approximately 0.000063 ft/ft. Using the highest hydraulic conductivity measured at the Pond 6 CCR unit monitoring wells (11.9 feet/day from the 2016 TRC well installation report) and an assumed effective porosity of 0.1, this results in a maximum inferred groundwater flow rate of approximately 0.0075 feet/day (approximately 2.7 feet/year). Groundwater potentiometric surface elevations measured across the Site during the October 2022 sampling event are provided on Table 1 and are summarized in plan view on Figure 3.

The extremely low gradient and/or lack of a consistent or discernable general flow direction is similar to that identified in previous monitoring rounds since the background sampling events commenced in November 2016 and continues to demonstrate that the downgradient compliance wells are appropriately positioned to detect the presence of detection monitoring constituents that could potentially migrate from the JRW Pond 6.

3.0 Statistical Evaluation

Detection monitoring is continuing at JR Whiting Pond 1&2 and Pond 6 in accordance with the HMP. The following section summarizes the statistical approach applied to assess the second semiannual 2022 groundwater data in accordance with the detection monitoring program.

3.1 Establishing Background Limits

Pond 1&2

Per the HMP, background limits were established for the detection monitoring constituents using data collected from each of the six established detection monitoring wells (JRW-MW-15001 through JRW-MW-15006). The background limits for each monitoring well have been calculated using thirteen rounds of data collected from November 2016 through March 2019 as presented in detail in the 2019 Annual Report. These background limits will continue to be used throughout the detection monitoring program to determine whether groundwater has been impacted from Pond 1&2 by comparing concentrations in the detection monitoring wells to their respective background limits for each detection monitoring constituent, with the exception of iron. Iron was incorporated into the monitoring program as part of the 2020 HMP. Background limits for iron will be calculated once a minimum of eight background data points have been collected from each monitoring location.

Pond 6

Per the HMP, background limits were established for the detection monitoring constituents following the twelfth round of background monitoring using data collected from each of the six established detection monitoring wells (JRW-MW-16001 through JRW-MW-16006). The statistical evaluation of the background data is presented in the Pond 6 July 2019 Annual Report. The detection monitoring background limits for each monitoring well will be used throughout the detection monitoring period to determine whether groundwater has been impacted from Pond 6 by comparing concentrations in the detection monitoring wells to their respective background limits for each detection monitoring constituent, with the exception of iron. Iron was incorporated into to the monitoring program as part of the 2020 HMP. Background limits for iron will be calculated once a minimum of eight background data points have been collected from each monitoring location.

3.2 Data Comparison to Background Limits – Pond 1&2 Second 2022 Semiannual Event (October 2022)

The concentrations of the constituents in each of the detection monitoring wells (JRW-MW-15001 through JRW-MW-15006) were compared to their respective statistical background limits calculated from the background data collected from each individual well (i.e., monitoring data from JRW-MW-15001 is compared to the background limit developed using the background dataset from JRW-MW-15001, and so forth). The comparisons are presented on Table 3.

The October 2022 data shows the concentrations of boron at JRW-MW-15002 and JRW-MW-15003 above the prediction limit. However, these have previously been demonstrated to be from natural variation in local and regional groundwater and are not from a release from the

CCR unit as documented in the July 2022 Alternate Source Demonstration (ASD) (TRC, July 2022). Conditions at Pond 1&2 have not changed and the July 2022 ASD is still applicable to the October 2022 boron results at JRW-15002 and JRW-15003. All other concentrations were below their respective background limits.

As such, there were no SSIs compared to background for any of the constituents. As no SSIs were found, detection monitoring will be continued at the Pond 1&2 CCR unit in accordance with the HMP. Per the EGLE prescribed submittal format, a statistical exceedances summary is included as Table 5 and reflects that no new statistical exceedances have occurred for the second 2022 semiannual monitoring event.

3.3 Data Comparison to Background Limits – Pond 6 Second 2022 Semiannual Event (October 2022)

The data comparisons of monitoring wells JRW-MW-16001 through JRW-MW-16006 for the October 2022 groundwater monitoring event are presented on Table 4.

There were no SSIs compared to background for any of the constituents. As no SSIs were found, detection monitoring will be continued at the Pond 6 CCR unit in accordance with the HMP. Per the EGLE prescribed submittal format, a statistical exceedances summary is included as Table 5 and reflects that no statistical exceedances have occurred for the first 2022 semiannual monitoring event.

4.0 Conclusions and Recommendations

As no SSIs were found attributable to Pond 1&2 or Pond 6 during the October 2022 monitoring event, Consumers Energy will continue with the detection monitoring program in conformance with the HMP. No corrective actions were needed or performed for either Pond 1&2 or Pond 6. The next semiannual monitoring event at the JR Whiting Pond 1&2 and Pond 6 CCR units is scheduled for the second calendar quarter of 2023.

5.0 References

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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.

Tables

Table 1

Potentiometric Groundwater Elevation Summary – October 2022

JR Whiting Pond 1 & 2 and Pond 6

Erie, Michigan

Well Location	Ground Surface Elevation (ft)	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Depth (ft BGS)			Screen Interval Elevation (ft)			October 6, 2022	
										Depth to Water (ft BTOC)	Groundwater Elevation (ft)
Static Water Level Monitoring Wells											
JRW-MW-16007	579.47	582.31	Limestone	68.0	to	78.0	511.5	to	501.5	6.52	575.79
JRW-MW-16008	579.95	582.83	Limestone	68.0	to	73.0	512.0	to	507.0	7.05	575.78
JRW-MW-16009	579.90	582.60	Limestone	69.0	to	79.0	510.9	to	500.9	6.81	575.79
Ponds 1 & 2											
JRW-MW-15001(1)	NM	581.39	Limestone	78.0	to	88.0	512.7	to	502.7	5.60	575.79
JRW-MW-15002(1)	NM	590.17	Limestone	81.0	to	91.0	511.3	to	501.3	14.39	575.78
JRW-MW-15003(1)	NM	587.23	Limestone	81.0	to	91.0	510.4	to	500.4	11.46	575.77
JRW-MW-15004(1)	NM	589.32	Limestone	86.0	to	96.0	506.5	to	496.5	13.57	575.75
JRW-MW-15005(1)	NM	588.28	Limestone	86.0	to	96.0	508.3	to	498.3	12.52	575.76
JRW-MW-15006(1)	NM	580.48	Limestone	81.0	to	91.0	511.0	to	501.0	4.71	575.77
Pond 6											
JRW-MW-16001	589.19	592.33	Limestone	71.0	to	81.0	518.2	to	508.2	16.58	575.75
JRW-MW-16002	585.78	588.69	Limestone	81.0	to	91.0	504.8	to	494.8	12.93	575.76
JRW-MW-16003	586.19	589.01	Limestone	73.0	to	83.0	513.2	to	503.2	13.24	575.77
JRW-MW-16004	586.48	589.34	Limestone	75.0	to	85.0	511.5	to	501.5	13.60	575.74
JRW-MW-16005	589.29	592.14	Limestone	78.0	to	88.0	511.3	to	501.3	16.40	575.74
JRW-MW-16006	588.26	591.04	Limestone	79.0	to	89.0	509.3	to	499.26	15.25	575.79

Notes:

Top of casing elevation survey was conducted by Rowe Professional Services Company in September 2019.

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.

ft BGS: Feet below ground surface.

(1) Screen interval depth below ground surface for Pond 1&2 monitoring wells approximated using an estimated final capped ground surface elevation of 590 feet above mean sea level. Screen interval elevations were measured using the original survey conducted by Sheridan Surveying Co. November 2015 at the time of monitoring well installation.

Table 2
Summary of Field Parameter Results - October and November 2022
JR Whiting Pond 1&2 and Pond 6
Erie, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Ponds 1 & 2							
JRW-MW-15001	10/6/2022	0.98	-115.6	7.4	1,071	14.5	6.76
JRW-MW-15002	10/6/2022	0.40	-151.5	7.4	1,118	15.0	4.79
JRW-MW-15003	10/6/2022	2.38	-4.3	7.5	991	15.3	5.12
JRW-MW-15004	10/6/2022	0.36	-44.1	7.5	968	17.1	6.25
JRW-MW-15005	10/6/2022	0.34	-59.5	7.7	867	15.5	3.74
JRW-MW-15006	10/6/2022	0.29	-170	7.6	968	14.5	4.98
Pond 6							
JRW-MW-16001	10/6/2022	3.36	-24.3	10.9(2)	695	14.6	6.39
	11/3/2022(1)	0.40	66.9	7.9	779	15.3	7.19
JRW-MW-16002	10/6/2022	1.10	-110.1	7.8	1,025	14.6	7.34
JRW-MW-16003	10/6/2022	0.36	-130.8	7.7	1,018	14.7	6.28
JRW-MW-16004	10/6/2022	0.55	-67.1	7.8	1,125	14.2	6.88
JRW-MW-16005	10/6/2022	0.39	-103.8	7.7	910	14.0	7.03
JRW-MW-16006	10/6/2022	0.60	-131.2	7.6	825	14.1	2.88

Notes:
mg/L - Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit.
(1) Results shown for verification sampling performed on 11/3/2022.
(2) Data determined to be not usable due to data quality objectives not being met. Resample collected 11/3/2022.

Table 3
Comparison of Groundwater Detection Monitoring Parameter Results to Background Limits – October 2022
JR Whiting Pond 1&2
Erie, Michigan

Sample Location:		JRW-MW-15001		JRW-MW-15002		JRW-MW-15003		JRW-MW-15004		JRW-MW-15005		JRW-MW-15006	
Sample Date:		10/6/2022	PL	10/6/2022	PL	10/6/2022	PL	10/6/2022	PL	10/6/2022	PL	10/6/2022	PL
Constituent	Unit	Data		Data		Data		Data		Data		Data	
Appendix III													
Boron	ug/L	216	240	**225**[(1)]	220	**241**[(1)]	230	245	270	215	270	217	250
Calcium	mg/L	145	180	125	180	121	160	122	140	117	120	129	140
Chloride	mg/L	45.6	55	42.1	56	44.4	55	46.3	56	32.4	46	43.9	53
Fluoride	ug/L	1,120	1,600	1,270	1,900	1,210	1,800	1,120	1,800	1,020	1,700	1,080	1,700
pH, Field	su	7.4	6.8 - 8.2	7.4	7.2 - 7.9	7.5	7.3 - 8.3	7.5	7.0 - 8.0	7.7	7.3 - 8.6	7.6	7.0 - 9.0
Sulfate	mg/L	380	470	382	500	331	440	330	390	308	350	336	410
Total Dissolved Solids	mg/L	797	1,000	804	1,100	693	940	681	880	608	840	710	920
Part 115 Parameters													
Iron	ug/L	842	n<8	655	n<8	109	n<8	64	n<8	139	n<8	1,090	n<8

Notes:
ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
-- = not analyzed
All metals were analyzed as total unless otherwise specified.
Bold font indicates an exceedance of the Prediction Limit (PL).
(1) Exceedance was determined to be from natural variability as detailed in the Alternative Source Demonstration: April 2022 Detection Monitoring Event Former JR Whiting Power Plant Ponds 1 and 2, Erie, Michigan dated July 28, 2022.

Table 4
Comparison of Groundwater Detection Monitoring Parameter Results to Background Limits – October and November 2022
JR Whiting Pond 6
Erie, Michigan

Sample Location:		JRW-MW-16001			JRW-MW-16002		JRW-MW-16003		JRW-MW-16004		JRW-MW-16005		JRW-MW-16006	
Sample Date:		10/6/2022	11/3/2022	PL	10/6/2022	PL	10/6/2022	PL	10/6/2022	PL	10/6/2022	PL	10/6/2022	PL
Constituent	Unit	Data			Data		Data		Data		Data		Data	
Appendix III														
Boron	ug/L	164	--	203	187	209	249	257	221	262	219	244	195	226
Calcium	mg/L	79.3	--	111	140	149	124	156	147	181	113	182	108	117
Chloride	mg/L	23.1	--	23.6	21.3	25.4	27	32.4	36.8	43.7	23.9	29.4	24.3	38.6
Fluoride	ug/L	< 1,000	--	2,300	< 1,000	1,400	1,020	1,600	1,040	1,700	1,090	1,800	1,100	2,200
pH, Field	su	10.9(1)	7.9	7.5 - 8.9	7.8	7.5 - 8.3	7.7	7.4 - 7.9	7.8	7.4 - 8.2	7.7	7.0 - 8.0	7.6	7.5 - 8.2
Sulfate	mg/L	237	--	278	394	426	381	470	434	507	309	498	290	399
Total Dissolved Solids	mg/L	404	--	770	718	832	695	1,040	826	1,110	611	1,030	575	904
Part 115 Parameters														
Iron	ug/L	< 20	--	n<8	279	n<8	408	n<8	281	n<8	316	n<8	264	n<8

Notes:
ug/L - micrograms per liter.
mg/L - milligrams per liter.
SU - standard units; pH is a field parameter.
-- = not analyzed
All metals were analyzed as total unless otherwise specified.
Bold font indicates an exceedance of the Prediction Limit (PL).
(1) Data determined to be not usable due to data quality objectives not being met. Resample collected 11/3/2022.

Table 5
Summary of Statistical Exceedances – October 2022
JR Whiting Pond 1 & 2 and Pond 6
Erie, Michigan

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

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

Facility: JR Whiting – WDS# 397664

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	4 Qtr. 2022 (**bold** >201)	2 Qtr. 2022 (**bold** >201)	4 Qtr. 2021 (**bold** >201)	2 Qtr. 2021 (**bold** >201)
JRW-MW-15002	JR Whiting Pond 1 & 2	Boron	500	220	225(1)	224(1)	204	187
JRW-MW-15003	JR Whiting Pond 1 & 2	Boron	500	230	241(1)	232(1)	216	203

NOTES:
(1) Exceedance was determined to be from natural variability as detailed in the Alternate Source Demonstration: April 2022 Detection Monitoring Event, Former JR Whiting Power Plant Ponds 1 and 2, Erie, Michigan dated July 28, 2022.

Figures

BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

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

0 3,000 6,000
FEET

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com
TRC - GIS

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	A. ADAIR
CHECKED BY:	B. YELEN
APPROVED BY:	S. HOLMSTROM
DATE:	JANUARY 2023
PROJ. NO.:	464089
FILE:	464089-001-001slm.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\464089-001-001slm.mxd -- Saved By: MHORN on 1/4/2023, 17:13:56 PM

LEGEND

- MONITORING WELL (STATIC WATER LEVEL ONLY)
- CCR UNIT MONITORING WELL

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 03/2021.
2. STATIC WATER ONLY WELL LOCATIONS SURVEYED BY SHERIDAN SURVEYING CO. ON 11/19/2015.
3. PONDS 1 & 2 WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 11/27 /2019.

N

0 500 1,000 Feet

1 " = 500 '

1:6,000

PROJECT:

CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:

SITE PLAN
WITH CCR MONITORING WELL LOCATIONS

DRAWN BY:	A. ADAIR	PROJ NO.:	464089
CHECKED BY:	B. YELEN		
APPROVED BY:	S. HOLMSTROM		**FIGURE 2**
DATE:	JANUARY 2023		

TRC

1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com

FILE NO.: 464089-001-002_SP.mxd

TRC - GIS
Plot Date: 1/4/2023, 17:19:16 PM by MHORN -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW2017_269767\464089-001-002_SP.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0

LEGEND

- MONITORING WELL (STATIC WATER LEVEL ONLY)
- CCR UNIT MONITORING WELL

LABEL FORMAT

MONITORING WELL ID
GROUNDWATER ELEVATION FT (MEASUREMENT DATE)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 03/2021.
2. WELL LOCATIONS SURVEYED BY SHERIDAN SURVEYING CO. ON 11/19/2015.
3. PONDS 1 & 2 WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 11/27/2019.
4. MONITORING WELL TOP OF CASING SURVEYED BY ROWE PROFESSIONAL SERVICES CO. ON 7/14/2020. VERTICAL DATUM IS NAVD88.

N

0 500 1,000 Feet

1 " = 500 '

1:6,000

PROJECT:
CONSUMERS ENERGY COMPANY
JR WHITING POWER PLANT
ERIE, MICHIGAN

TITLE:
GROUNDWATER POTENTIOMETRIC ELEVATION SUMMARY OCTOBER 2022

DRAWN BY:	M. HORN	PROJ NO.:	464089
CHECKED BY:	B. YELEN		
APPROVED BY:	S. HOLMSTROM		**FIGURE 3**
DATE:	JANUARY 2023		

TRC
1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
www.trccompanies.com

FILE NO.: 464089-001-003_GWP_FALL.mxd

Plot Date: 1/6/2023, 14:36:15 PM by MHORN -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\464089-001-003_GWP_FALL.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

Appendix A
Data Quality Reviews

Pond 1 & 2

Laboratory Data Quality Review
Groundwater Sampling Event October 2022
Consumers Energy JR Whiting Pond 1 & 2

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the October 2022 groundwater monitoring sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by CE Laboratory Services, located in Jackson, Michigan. The laboratory analytical results were reported in laboratory project number 22-1059.

During the October 2022 sampling event, a groundwater sample was collected from each of the following wells:

- JRW-MW-15001
- JRW-MW-15002
- JRW-MW-15003
- JRW-MW-15004
- JRW-MW-15005
- JRW-MW-15006

Each sample was analyzed for the following constituents:

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

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

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund 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 equipment blanks and field blanks. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- 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 the laboratory. 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.

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.

Findings

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable, with the exceptions noted below. The discussion that follows describes the QA/QC results and evaluation.

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 constituents as well as iron will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.
- When the data are evaluated through a detection monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One equipment blank (EB-01) and one field blank (FB-01) were collected. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample JRW-MW-15006 for total metals and anions. 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 MS/MSD recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- The field duplicate pair samples were DUP-01/ JRW-MW-15002. All criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Pond 6

Laboratory Data Quality Review
Groundwater Sampling Event October 2022
Consumers Energy JR Whiting Pond 6

Groundwater samples were collected by Consumers Energy (CE) Laboratory Services for the October 2022 groundwater monitoring sampling event. Samples were analyzed for anions, total metals, and total dissolved solids by CE Laboratory Services, located in Jackson, Michigan. The laboratory analytical results were reported in laboratory project number 22-1060.

During the October 2022 sampling event, a groundwater sample was collected from each of the following wells:

- JRW-MW-16001
- JRW-MW-16002
- JRW-MW-16003
- JRW-MW-16004
- JRW-MW-16005
- JRW-MW-16006

Each sample was analyzed for the following constituents:

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

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

Data Quality Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund 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 equipment blanks and field blanks. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- 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 the laboratory. 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.

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.

Findings

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable, with the exceptions noted below. The discussion that follows describes the QA/QC results and evaluation.

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 constituents as well as iron will be utilized for the purposes of a detection monitoring program.
- Data are usable for the purposes of the detection monitoring program.
- When the data are evaluated through a detection monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One equipment blank (EB-02) and one field blank (FB-02) were collected. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample JRW-MW-16003 for total metals and anions. 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 MS/MSD recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- The field duplicate pair samples were DUP-02/ JRW-MW-16005. All criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Field Parameter pH Data Quality Review
Groundwater Sampling Event October 2022
Consumers Energy JR Whiting Pond 6

The groundwater field parameter pH was collected in conjunction with analytical samples by Consumers Energy (CE) Laboratory Services for the October 2022 groundwater monitoring sampling event. Groundwater sample collection procedures are detailed in the *JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Power Plant, Erie, Michigan (2020 HMP) (TRC, May 2020 Revision)*.

During the October 2022 sampling event, pH data was collected from each of the following wells:

- JRW-MW-16001
- JRW-MW-16002
- JRW-MW-16003
- JRW-MW-16004
- JRW-MW-16005
- JRW-MW-16006

TRC routinely reviews the field parameter data to assess data usability. The following sections summarize the data review procedure and the results of this review.

Data Quality Review Procedure

The following items were included in the evaluation of the field parameter data:

- Review of sonde calibration data;
- Review of sampling procedures;
- Compare field parameters to historical data;
- Confirm field parameter stabilization criteria were met, and;
- Overall usability of data based on these items.

Findings

The data quality objectives for the project were met and the data are usable. The discussion that follows describes the QA/QC results and evaluation.

- Sonde calibration readings were within the calibration range for all field parameters.
- Sampling and purging protocols for pH were not followed prior to data collection at JRW-MW-16001. Per the 2020 HMP, if during initial monitoring well purging the pH is elevated at the low flow purging rate (pH > 8 SU) and does not decline quickly to below 8 SU under low flow purging rates, then contingency protocols should be used. The contingency purging protocol has been developed to ensure that the field pH measured is representative of formation groundwater and is not influenced by the presence of the grout seal installed above the well screen. Given that pH has a limited influence on the other Appendix III constituents, data usability for the other constituents is unaffected.

  Sampling procedures for all other Pond 6 wells were followed per the 2020 HMP.

- The field pH reading of 10.86 SU at monitoring well JRW-MW-16001 was elevated above historical data of <8.0 SU. Field parameter readings at all other Pond 6 monitoring wells were comparable to historical data.
- Field parameters met stabilization criteria for three successive readings.
- The pH value of 10.86 SU at monitoring well JRW-MW-16001 was collected without implementing contingency sampling protocols applicable to an initial field pH reading >8.0 SU and is comparatively higher than historical results. Due to contingency procedures not being followed, data quality objectives were not met. The elevated pH reading compared to historical data that were collected using proper procedures per the HMP further supports that the JRW-MW-16001 result may not be representative of formation groundwater. Therefore, the pH data at JRW-MW-16001 is not considered usable for its intended purpose of detection monitoring.

  The pH data at all other Pond 6 monitoring wells are considered usable for their intended purpose.

Field Parameter Data Quality Review
Groundwater Sampling Event November 2022 Resampling
CEC JR Whiting Pond 6

On November 3, 2022, groundwater was resampled for pH (field measured) at monitoring well JRW-MW-16001. Groundwater sample collection procedures are detailed in the *JR Whiting Hydrogeological Monitoring Plan, former JR Whiting Power Plant, Erie, Michigan (2020 HMP) (TRC, May 2020 Revision)*.

TRC routinely reviews the field parameter data to assess data usability. The following sections summarize the data review procedure and the results of this review.

Data Quality Review Procedure

The following items were included in the evaluation of the field parameter data:

- Review of sonde calibration data;
- Review of field data collection procedures;
- Confirm field parameter stabilization criteria were met;
- Compare field parameters to historical data, and;
- Overall usability of data based on these items.

Findings

The data quality objectives for the project were met and the data are usable. The discussion that follows describes the QA/QC results and evaluation.

- Sonde calibration readings were within the calibration range for all field parameters.
- Data collection was performed per the HMP.
- Field parameters met stabilization criteria for three successive readings.
- Field parameter readings were comparable to historical data.
- Data are usable for purposes of detection monitoring.

Appendix B
Laboratory Reports

Pond 1 & 2

Consumers Energy
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135 W. Trail St.
Jackson, MI 49201

phone 517-788-1251
fax 517-788-2533

To: MAMarion, P22-118

From: EBlaj, T-258

Date: October 23, 2022

Subject: RCRA GROUNDWATER MONITORING – JR WHITING POND 1 & 2 – 2022 Q2

CC: Sarah Holmstrom, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-1059

CE Laboratory Services conducted groundwater monitoring at JR Whiting, Pond 1 & 2 on 10/06/2022, for the 2nd Semiannual monitoring requirement, and 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 10/07/2022.

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

ilac-MRA A2LA ACCREDITED Certificate #1097.04

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

I. Sample Receipt

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

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: JR Whiting Complex
Work Order ID: JRW RCRA GW Monitoring - Pond 1&2 - October 2022
Date Received: 10/7/2022
Chemistry Project: 22-1059

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-1059-01	JRW-MW-15001	Groundwater	10/06/2022 11:11 AM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-02	JRW-MW-15002	Groundwater	10/06/2022 11:19 AM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-03	JRW-MW-15003	Groundwater	10/06/2022 12:33 PM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-04	JRW-MW-15004	Groundwater	10/06/2022 01:28 PM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-05	JRW-MW-15005	Groundwater	10/06/2022 12:44 PM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-06	JRW-MW-15006	Groundwater	10/06/2022 11:59 AM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-07	DUP-01	Groundwater	10/06/2022 11:19 AM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-08	EB-01	Water	10/06/2022 01:57 PM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-09	FB-01	Water	10/06/2022 01:57 PM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-10	JRW-MW-15006 Field MS	Groundwater	10/06/2022 11:59 AM	JRW RCRA GW Monitoring - Pond 1&2
22-1059-11	JRW-MW-15006 FIeld MSD	Groundwater	10/06/2022 11:59 AM	JRW RCRA GW Monitoring - Pond 1&2

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15001**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-01	Collect Time:	11:11 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	216		ug/L	20	10/18/2022	AB22-1018-07
Calcium	145000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	842		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-01-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	45600		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1120		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	380000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-01-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	797		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15002**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-02	Collect Time:	11:19 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	225		ug/L	20	10/18/2022	AB22-1018-07
Calcium	125000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	655		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-02-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	42100		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1270		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	382000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-02-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	804		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15003**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-03	Collect Time:	12:33 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	241		ug/L	20	10/18/2022	AB22-1018-07
Calcium	121000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	109		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-03-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	44400		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1210		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	331000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-03-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	693		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15004**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-04	Collect Time:	01:28 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	245		ug/L	20	10/18/2022	AB22-1018-07
Calcium	122000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	64		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-04-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	46300		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1120		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	330000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-04-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	681		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15005**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-05	Collect Time:	12:44 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	215		ug/L	20	10/18/2022	AB22-1018-07
Calcium	117000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	139		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-05-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	32400		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1020		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	308000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-05-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	608		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15006**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-06	Collect Time:	11:59 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	217		ug/L	20	10/18/2022	AB22-1018-07
Calcium	129000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	1090		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-06-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	43900		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1080		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	336000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-06-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	710		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**DUP-01**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-07	Collect Time:	11:19 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	226		ug/L	20	10/18/2022	AB22-1018-07
Calcium	125000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	636		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-07-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	42800		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1220		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	404000		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-07-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	771		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**EB-01**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-08	Collect Time:	01:57 PM
Matrix:	Water		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	10/18/2022	AB22-1018-07
Calcium	ND		ug/L	1000	10/18/2022	AB22-1018-07
Iron	ND		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-08-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	ND		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-08-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site: **JRW RCRA GW Monitoring - Pond 1&2**
Field Sample ID: **FB-01**
Lab Sample ID: 22-1059-09
Matrix: Water

Laboratory Project: **22-1059**
Collect Date: 10/06/2022
Collect Time: 01:57 PM

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	10/18/2022	AB22-1018-07
Calcium	ND		ug/L	1000	10/18/2022	AB22-1018-07
Iron	ND		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-09-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	ND		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1059-09-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15006 Field MS**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-10	Collect Time:	11:59 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	110		%	20	10/18/2022	AB22-1018-07
Calcium	111		%	1000	10/18/2022	AB22-1018-07
Iron	100		%	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-10-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	96		%	1000	10/19/2022	AB22-1019-05
Fluoride	91		%	1000	10/19/2022	AB22-1019-05
Sulfate	104		%	1000	10/19/2022	AB22-1019-05

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 1&2**	Laboratory Project:	**22-1059**
Field Sample ID:	**JRW-MW-15006 FIeld MSD**	Collect Date:	10/06/2022
Lab Sample ID:	22-1059-11	Collect Time:	11:59 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1059-11-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	114		%	20	10/18/2022	AB22-1018-07
Calcium	116		%	1000	10/18/2022	AB22-1018-07
Iron	104		%	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1059-11-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	91		%	1000	10/19/2022	AB22-1019-05
Fluoride	93		%	1000	10/19/2022	AB22-1019-05
Sulfate	98		%	1000	10/19/2022	AB22-1019-05

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-1059

Inspection Date: 10-12-22 **Inspection By:** CET

Sample Origin/Project Name: JR Whiting

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) CET/KOR/MLR

Tracking Number: _____ Shipping Form Attached: Yes _____ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1.8 - 5.9 °C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015402 Exp 05-25-23

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	~~22~~ 22 10-12-22				
24 mL vial (glass)					
500 mL (plastic)					
Other 250 mL plastic	9				

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: JRW Pond 1&2 GW Monitoring – October 2022

PROJECT NUMBER: **22-1059**

SAP CC or WO#:

REQUESTER: Michelle Marion

SAMPLING TEAM: CET/KDR

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Michelle Marion

email:

phone:

COPY TO: TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	REMARKS
22-1059-01	10/6/22	1111	GW	JRW-MW-15001	3	2	1						x	x	x	
-02		11:19	GW	JRW-MW-15002	3	2	1						x	x	x	
-03		12:33	GW	JRW-MW-15003	3	2	1						x	x	x	
-04		13:28	GW	JRW-MW-15004	3	2	1						x	x	x	
-05		1244	GW	JRW-MW-15005	3	2	1						x	x	x	
-06		1159	GW	JRW-MW-15006	3	2	1						x	x	x	
-07		11:19	GW	DUP-01	3	2	1						x	x	x	
-08		1357	W	EB-01	3	2	1						x	x	x	
-09		1357	W	FB-01	3	2	1						x	x	x	
-10		1159	GW	JRW-MW-15006 MS	2	1	1						x	x		
-11		1159	GW	JRW-MW-15006 MSD	2	1	1						x	x		

RELINQUISHED BY: [signature] DATE/TIME: 10-7-22 1300 RECEIVED BY: [signature]

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 01502

Temperature: 1.8-5.9 °C Cal. Due Date: 05-25-23

Pond 6

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

To: MAMarion, P22-118

From: EBlaj, T-258

Date: October 23, 2022

Subject: RCRA GROUNDWATER MONITORING – JR WHITING POND 6 – 2022 Q4

CC: Sarah Holmstrom, Project Manager
TRC Environmental Corporation
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-1060

CE Laboratory Services conducted groundwater monitoring at JR Whiting, Pond 6, on 10/06/2022, for the 2nd Semiannual monitoring requirement, and as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis in the Chemistry department of Laboratory Services on 10/07/2022.

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

ilac-MRA A2LA ACCREDITED Certificate #1097.04

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

I. Sample Receipt

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

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: JR Whiting Complex
Work Order ID: JRW RCRA GW Monitoring - Pond 6 - April 2022
Date Received: 10/7/2022
Chemistry Project: 22-1060

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-1060-01	JRW-MW-16001	Groundwater	10/06/2022 01:15 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-02	JRW-MW-16002	Groundwater	10/06/2022 02:00 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-03	JRW-MW-16003	Groundwater	10/06/2022 02:35 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-04	JRW-MW-16004	Groundwater	10/06/2022 02:50 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-05	JRW-MW-16005	Groundwater	10/06/2022 12:20 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-06	JRW-MW-16006	Groundwater	10/06/2022 03:10 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-07	DUP-02	Groundwater	10/06/2022 12:00 AM	JRW RCRA GW Monitoring - Pond 6
22-1060-08	EB-02	Water	10/06/2022 01:20 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-09	FB-02	Water	10/06/2022 12:55 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-10	JRW-MW-16003 Field MS	Groundwater	10/06/2022 02:35 PM	JRW RCRA GW Monitoring - Pond 6
22-1060-11	JRW-MW-16003 FIeld MSD	Groundwater	10/06/2022 02:35 PM	JRW RCRA GW Monitoring - Pond 6

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16001**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-01	Collect Time:	01:15 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	164		ug/L	20	10/18/2022	AB22-1018-07
Calcium	79300		ug/L	1000	10/18/2022	AB22-1018-07
Iron	ND		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-01-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	23100		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	237000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-01-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	404		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16002**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-02	Collect Time:	02:00 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	187		ug/L	20	10/18/2022	AB22-1018-07
Calcium	140000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	279		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-02-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	21300		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	394000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-02-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	718		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site: **JRW RCRA GW Monitoring - Pond 6**
Field Sample ID: **JRW-MW-16003**
Lab Sample ID: 22-1060-03
Matrix: Groundwater

Laboratory Project: **22-1060**
Collect Date: 10/06/2022
Collect Time: 02:35 PM

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	249		ug/L	20	10/18/2022	AB22-1018-07
Calcium	124000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	408		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-03-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	27000		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1020		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	381000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-03-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	695		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16004**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-04	Collect Time:	02:50 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	221		ug/L	20	10/18/2022	AB22-1018-07
Calcium	147000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	281		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-04-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	36800		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1040		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	434000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-04-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	826		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16005**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-05	Collect Time:	12:20 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	219		ug/L	20	10/18/2022	AB22-1018-07
Calcium	113000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	316		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-05-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	23900		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1090		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	309000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-05-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	611		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16006**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-06	Collect Time:	03:10 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	195		ug/L	20	10/18/2022	AB22-1018-07
Calcium	108000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	264		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-06-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	24300		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1100		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	290000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-06-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	575		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**DUP-02**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-07	Collect Time:	12:00 AM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	224		ug/L	20	10/18/2022	AB22-1018-07
Calcium	111000		ug/L	1000	10/18/2022	AB22-1018-07
Iron	328		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-07-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	24100		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	1130		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	306000		ug/L	1000	10/20/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-07-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	632		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site: **JRW RCRA GW Monitoring - Pond 6**
Field Sample ID: **EB-02**
Lab Sample ID: 22-1060-08
Matrix: Water

Laboratory Project: **22-1060**
Collect Date: 10/06/2022
Collect Time: 01:20 PM

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	10/18/2022	AB22-1018-07
Calcium	ND		ug/L	1000	10/18/2022	AB22-1018-07
Iron	ND		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-08-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	ND		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-08-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**FB-02**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-09	Collect Time:	12:55 PM
Matrix:	Water		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	ND		ug/L	20	10/18/2022	AB22-1018-07
Calcium	ND		ug/L	1000	10/18/2022	AB22-1018-07
Iron	ND		ug/L	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-09-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Fluoride	ND		ug/L	1000	10/19/2022	AB22-1019-05
Sulfate	ND		ug/L	1000	10/19/2022	AB22-1019-05

Total Dissolved Solids by SM 2540C

Aliquot: 22-1060-09-C03-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Total Dissolved Solids	ND		mg/L	10	10/12/2022	AB22-1012-04

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16003 Field MS**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-10	Collect Time:	02:35 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	107		%	20	10/18/2022	AB22-1018-07
Calcium	109		%	1000	10/18/2022	AB22-1018-07
Iron	91		%	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-10-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	100		%	1000	10/19/2022	AB22-1019-05
Fluoride	91		%	1000	10/19/2022	AB22-1019-05
Sulfate	98		%	1000	10/20/2022	AB22-1019-05

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Analytical Report

Report Date: 10/23/22

Sample Site:	**JRW RCRA GW Monitoring - Pond 6**	Laboratory Project:	**22-1060**
Field Sample ID:	**JRW-MW-16003 FIeld MSD**	Collect Date:	10/06/2022
Lab Sample ID:	22-1060-11	Collect Time:	02:35 PM
Matrix:	Groundwater		

Metals by EPA 6020B: CCR Rule Appendix III and Fe Total Metals

Aliquot: 22-1060-11-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Boron	102		%	20	10/18/2022	AB22-1018-07
Calcium	109		%	1000	10/18/2022	AB22-1018-07
Iron	88		%	20	10/18/2022	AB22-1018-07

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

Aliquot: 22-1060-11-C02-A01 **Analyst: TMR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking #
Chloride	101		%	1000	10/19/2022	AB22-1019-05
Fluoride	90		%	1000	10/19/2022	AB22-1019-05
Sulfate	106		%	1000	10/20/2022	AB22-1019-05

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-1060

Inspection Date: 10-12-22 **Inspection By:** CET

Sample Origin/Project Name: JR Whiting

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx _____ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) CET/KDR/MLR

Tracking Number: _____ Shipping Form Attached: Yes _____ No _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 2.4 - 5.1 °C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015402 Exp 05-25-23

Number and Type of Containers: Enter the total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)					
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	22				
24 mL vial (glass)					
500 mL (plastic)					
Other 250 mL plastic	9				

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Page 1 of 1

SAMPLING SITE / CUSTOMER: JRW Pond 6 GW Monitoring – October 2022

PROJECT NUMBER: **22-1060**

SAP CC or WO#:

REQUESTER: Michelle Marion

SAMPLING TEAM: MLR CET KDR

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Michelle Marion — email: — phone:

COPY TO: TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	PRESERVATIVE HNO_3	PRESERVATIVE H_2SO_4	PRESERVATIVE NaOH	PRESERVATIVE HCl	PRESERVATIVE MeOH	PRESERVATIVE Other	Total Metals	Anions	TDS	REMARKS
22-1060-01	10-6-22	1315	GW	JRW-MW-16001	3	2	1						x	x	x	
-02	10-6-22	1400	GW	JRW-MW-16002	3	2	1						x	x	x	
-03	10-5-22	1435	GW	JRW-MW-16003	3	2	1						x	x	x	
-04	10-5-22	1450	GW	JRW-MW-16004	3	2	1						x	x	x	
-05	1220 → 10/5/22		GW	JRW-MW-16005 MLR 10/6/22	3	2	1						x	x	x	
-06	10/6/22	1510	GW	JRW-MW-16006	3	2	1						x	x	x	
-07	10-6-22	—	GW	DUP-02	3	2	1						x	x	x	
-08	10-6-22	1320 1255 MLR 10/6/22	W	EB-02	3	2	1						x	x	x	
-09	10-6-22	1255	W	FB-02	3	2	1						x	x	x	
-10	10-6-22	1435	GW	JRW-MW-16003 MS	2	1	1						x	x		
-11	10-6-22	1435	GW	JRW-MW-16003 MSD	2	1	1						x	x		

RELINQUISHED BY: [signature] DATE/TIME: 10-7-22 1300 RECEIVED BY: [signature]

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015402

Temperature: 2.4-5.1 °C Cal. Due Date: 05-25-23

Appendix C
Field Notes

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Sonde ID	**19M**
Start Date	10-6-22
Project #	22-1059-1060
Site	JR Whiting
Reviewed By & Date	10-19-22

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 19M100493
Sonde Brand	YSI ProDSS S/N 19M100509
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 19L103208
Turbidity Probe	YSI ProDSS S/N 19L103271
pH With ORP	YSI ProDSS S/N 22D102305
Conductivity & Temperature Probe	YSI ProDSS S/N 19L101251

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	22110129	3-12-24	3.98					4.04
7.0	GFS # 1639	22140169	4-2-24	7.02					7.00
10.0	GFS # 1645	22200197	5-26-24	10.07					10.02
			Initials & Date:	CF 10-5-22					CF 10-7-22

- Are the calibration values within ±0.10 of the standard? Y or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
229 (mV)	GFS	22130152	8-25-22	230.1					232.2
			Initials & Date:	CF 10-5-22					CF 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? Y or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	95.2					95.2
			Initials & Date:	CF 10-5-22					CF 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%? Y or N (if no, recalibration is required)

Sonde ID	19M	Project # :
Start Date	10-6-22	22-1059 / 1060
Reviewed By & Date:	10-19-22	Site: UR Whiting

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1413	GFS	21500094	1-3-23	1439					1422
			Initials & Date:	LR 10.5.22					LR 10-7-22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within range of the standard? (Y) or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.00					0.01
10.0 (± 1.0 NTUs)	Hach 2659949	—	—	N/A	—	—	N/A	—	—
40.0 (± 4.0 NTUs)	Hach 2746356	A103	Apr 2023	41.02					42.03
			Initials & Date:	LR 10-5-22					LR 10-7-22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS Chemicals			pH 9.0 Check	GFS Chemicals		
pH 7.0	GFS Chemicals						
pH 10.0	GFS Chemicals						
Sp. Conductivity	GFS Chemicals						
40.0 Turbidity	GFS Chemicals						
10.0 Turbidity	GFS Chemicals						

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Sonde ID	20G
Start Date	10-6-22
Project #	22-1059 / 1060
Site	JR Whiting
Reviewed By & Date	10-19-22

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 20G101513
Sonde Brand	YSI ProDSS S/N 20G101574
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 20H100646
Turbidity Probe	YSI ProDSS S/N 20G104758
pH With ORP	YSI ProDSS S/N 20G105177
Conductivity & Temperature Probe	YSI ProDSS S/N 20G104783

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	22110129	3-12-24	3.90					4.02
7.0	GFS # 1639	22140169	4-2-24	6.90					7.01
10.0	GFS # 1645	22200197	5-26-24	9.91					10.06
			Initials & Date:	CR 10-5-22					CR 10-7-22

- Are the calibration values within ±0.10 of the standard? Y or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
228 (mV)	GFS	22130152	8-25-22	231.3					229.9
			Initials & Date:	CR 10-5-22					CR 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? Y or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	95.2					96.1
			Initials & Date:	CR 10-5-22					CR 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%? Y or N (if no, recalibration is required)

Sonde ID	20G	Project # :
Start Date	10-6-22	22-1059 / 1060
Reviewed By & Date:	10-19-22	Site: JR Whiting

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1413	GFS	21C00094	1-3-23	1456					1420
			Initials & Date:	CS 10-5-22					CS 10-7-22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within range of the standard? (Y) or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	0.07					0.01
10.0 (± 1.0 NTUs)	Hach 2659949	—	—	N/A	—	—	N/A	—	—
40.0 (± 4.0 NTUs)	Hach 2746356	21103	Apr 2023	39.60					41.01
			Initials & Date:	CS 10-5-22					CS 10-7-22

- Is the same standard used for calibration and as-founds? (Y) or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? (Y) or N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS Chemicals			pH 9.0 Check	GFS Chemicals		
pH 7.0	GFS Chemicals						
pH 10.0	GFS Chemicals						
Sp. Conductivity	GFS Chemicals						
40.0 Turbidity	GFS Chemicals						
10.0 Turbidity	GFS Chemicals						

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Sonde ID	**21G**
Start Date	10-6-22
Project #	22-1059 / 1060
Site	JR Whiting
Reviewed By & Date	10-19-22

Equipment Details	Model & S/N
Monitor Brand	YSI ProDSS S/N 21G102278
Sonde Brand	YSI ProDSS S/N 21G105848
Flow Cell	EXO1 599080
DO Probe	YSI ProDSS S/N 21G101534
Turbidity Probe	YSI ProDSS S/N 21G101646
pH With ORP	YSI ProDSS S/N 21H101604
Conductivity & Temperature Probe	YSI ProDSS S/N 21G101888

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)

pH Standard (± 0.1)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
4.0	GFS # 1634	22110129	3-12-24	4.02					4.09
7.0	GFS # 1639	22140164	4-2-24	7.04					7.00
10.0	GFS # 1645	22200197	5.26-24	9.98					10.00
			Initials & Date:	CR 10-5-22					CR 10-7-22

- Are the calibration values within ±0.10 of the standard? Y or N (if no, recalibration is required)

ORP Standard (± 10mV)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
228 (mV)	GFS	22130152	8-25.22	220.1					227.2
			Initials & Date:	CR 10-5-22					CR 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? Y or N (if no, recalibration is required).

DO	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Filed Checks Completed	End Project Calibration Value
90-110% saturation	DI Water	N/A	N/A	97.1					95.8
			Initials & Date:	CR 10-5-22					CR 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within 90-110%? Y or N (if no, recalibration is required)

Sonde ID	21G	Project #:
Start Date	10-6-22	22-1059 / 1060
Reviewed By & Date:	10-19-22	Site: JR Whiting

Specific Conductance (uS/cm)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
1413	GFS	21506064	1-3-23	1420					1431
			Initials & Date:	CF 10-5-22					CF 10-7-22

- Is the same standard used for calibration and as-founds? CF 10-5-22 Y or N (if no, document on pg. 2)
- Are the calibration values within range of the standard? Y or N (if no, recalibration is required)

Turbidity (NTUs)	Source	Source Lot #	Source Exp. Date	Pre -Project Calibration Value	1st Daily Field Checks Completed	2nd Daily Field Checks Completed	3rd Daily Field Checks Completed	4th Daily Field Checks Completed	End Project Calibration Value
0	DI Water	--	--	-0.01					0.04
10.0 (± 1.0 NTUs)	Hach 2659949	—	—	N/A	-	—	N/A	-	—
40.0 (± 4.0 NTUs)	Hach 2746356	A1107	Apr 2023	38.99					40.81
			Initials & Date:	CF 10-5-22					CF 10-7-22

- Is the same standard used for calibration and as-founds? Y or N (if no, document on pg. 2)
- Are the calibration values within ±10% of the standard? Y or N (if no, recalibration is required)

Additional Information for calibration standards

Standard	Source	Source Lot #	Source Exp. Date	Standard	Source	Source Lot #	Source Exp. Date
pH 4.0	GFS Chemicals			pH 9.0 Check	GFS Chemicals		
pH 7.0	GFS Chemicals						
pH 10.0	GFS Chemicals						
Sp. Conductivity	GFS Chemicals						
40.0 Turbidity	GFS Chemicals						
10.0 Turbidity	GFS Chemicals						

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WATER LEVEL DATA

Site: JRW
Project No: 22-1059
Reviewed by: [signature]
Analyst: CET, KDR
Review Date: 10-19-22
Date: 10/6/22
Method:
Tape ID: Solinst 101 S/N: 501491

Well ID	Time	DTW Trial 1 (ft)	DTW Trial 2 (ft)	DTB (ft)	Remarks
JRW MW-15001	10:13	5.60	5.60	81.68	
JRW MW-15002	09:55	14.39	14.39	91.99	
JRW MW-15003	09:59	11.46	11.46	90.01	
JRW MW-15004	10:02	13.57	13.57	96.17	
JRW MW-15005	10:06	12.52	12.52	93.38	
JRW MW-15006	10:10	4.75	4.75	82.71	4.71 Reduced
JRW MW-16001					marked TOC
JRW MW-16002					marked TOC
JRW MW-16003					marked TOC
JRW MW-16004					marked TOC
JRW MW-16005					marked TOC
JRW MW-16006					marked TOC
JRW MW-16007	09:30	6.52	6.52	80.69	marked TOC
JRW MW-16008	09:33	7.05	7.05	76.04	Bees nest in well cap marked TOC
JRW MW-16009	09:36	6.81	6.81	81.63	marked TOC

NOTES: *TOC reference point*
DTW = Depth to Water
DTB = Depth to Bottom

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Monitoring Well Sampling Worksheet

Well ID 15001 Date 10-6-22 Control Number 22-1059-01

Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst 101 S/N: 501491

QC SAMPLE: ☐ **MS/MSD** ☐ **DUP**____ **Sonde ID:** ☐ 15H ☐ 19M ☑ 20G ☐ 21G

Depth-to-water T/PVC (ft) 5.61 Depth-To-Bottom T/PVC (ft) _____ Completed by CET

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1028							200	5.74	
1030	7.02	14.5	1076	38.3	3.89	66.3	200	5.74	6.01
1035	7.08	14.5	1072	36.8	3.74	47.1	200	5.74	6.64
1040	7.24	14.6	1070	35.5	3.59	30.3	200	5.74	6.67
1045	7.37	14.4	1070	31.5	3.20	14.5	200	5.74	8.26
1050	7.39	14.7	1069	21.3	2.15	-83.2	200	5.74	6.85
1055	7.40	14.6	1071	15.1	1.53	-107.8	200	5.74	8.19
1100	7.40	14.7	1071	11.1	1.11	-109.9	200	5.74	6.60
1105	7.42	14.6	1072	10.7	1.08	-111.0	200	5.74	6.76
1110	7.43	14.5	1071	9.7	0.98	-115.6	200	5.74	6.76
1111									
1116									

Total Pump Time (min): 48 Total Purge Volume (gal): ≈ 2.5 gal Reviewed by:

Weather: _____ Review Date: 10.19.22

Comments: Bat nest in sign for JRW-MW-15001

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125 mL	HDPE	A	N					
1	1 L	〃	B	〃					
1	250 mL	〃	B EHO-6-22	—					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW-MW-15002 Date 10/6/22 Control Number 22-1059-02, 07
Location JRW Well Material: [✓] PVC [ ] SS [ ] Iron [ ] Galv. Steel

Purge Method: [✓] Peristaltic [ ] Submersible [ ] Bladder [ ] Fultz [ ] Bailer

Depth to Water Tape: Solinst 101 S/N: 379851

QC SAMPLE: [ ] MS/MSD [✓] DUP 01 Sonde ID: [ ] 15H [ ] 19M [ ] 20G [✓] 21G

Depth-to-water T/PVC (ft) 14.37 Depth-To-Bottom T/PVC (ft) 91.99 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
10:40							200	14.40	
10:43	8.00	14.5	1079	25.5	2.41	-73.1	200	14.40	4.47
10:48	7.40	14.6	1104	7.4	0.75	-102.7	200	14.40	5.66
10:53	7.36	14.9	1114	5.6	0.56	-118.7	200	14.40	5.13
10:58	7.42	14.9	1115	5.1	0.51	-131.3	200	14.40	5.02
11:03	7.44	14.9	1118	4.7	0.47	-138.8	200	14.40	4.97
11:08	7.44	15.1	1117	4.5	0.45	-143.9	200	14.40	4.91
11:13	7.47	15.3	1117	4.3	0.43	-149.2	200	14.40	4.86
11:18	7.43	15.0	1118	4.1	0.40	-151.5	200	14.40	4.79
11:19	Collected sample								
11:25	sample stop time								

Total Pump Time (min): 39 Total Purge Volume (gal) : ≈ 2.0 Reviewed by:

Weather: 63°F, Sunny, windy Review Date: 10-19-22

Comments:

Bottles Filled					Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____				
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	125mL	HDPE	B	N					
2	125mL	HDPE	A	N					
2	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

Laboratory Services

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Monitoring Well Sampling Worksheet

Well ID JRW-MW-15003 Date 10/6/22 Control Number 22-1059-03

Location JRW Well Material: [✓] PVC [ ] SS [ ] Iron [ ] Galv. Steel

Purge Method: [✓] Peristaltic [ ] Submersible [ ] Bladder [ ] Fultz [ ] Bailer

Depth to Water Tape: Solinst 101 S/N: 379851

QC SAMPLE: [ ] MS/MSD [ ] DUP____ **Sonde ID:** [ ] 15H [ ] 19M [ ] 20G [✓] 21G

Depth-to-water T/PVC (ft) 11.46 Depth-To-Bottom T/PVC (ft) 90.01 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
11:47							204	11.50	
11:52	9.04	15.7	1006	34.2	3.32	-11.7	204	11.50	3.62
11:57	7.72	15.2	995	24.8	2.49	-9.2	204	11.50	5.13
12:02	7.57	15.3	996	24.9	2.49	-2.9	204	11.50	5.11
12:07	7.55	15.3	994	24.9	2.49	-0.9	204	11.50	5.04
12:12	7.53	15.2	996	24.4	2.44	-3.8	204	11.50	4.95
12:17	7.53	15.2	993	23.7	2.37	-5.6	204	11.50	4.82
12:22	7.52	15.1	992	23.6	2.37	-4.4	204	11.50	4.99
12:27	7.51	15.2	992	24.0	2.40	-5.2	204	11.50	5.08
12:32	7.50	15.3	991	23.8	2.38	-4.3	204	11.50	5.12
12:33	Collected sample								
12:36	Sample stop time								

Total Pump Time (min): 46 Total Purge Volume (gal) : ≈2.0 Reviewed by: [signature]

Weather: 65°F, Sunny, light wind Review Date: 10-19-22

Comments:

Bottles Filled					Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____				
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	HDPE	A	N					
1	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW-MW-15004 Date 10/6/22 Control Number 22-1059-04
Location JRW Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst 101 S/N: ~~5~~ 379851 KDR 10/6/22

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 15H ☐ 19M ☐ 20G ☑ 21G

Depth-to-water T/PVC (ft) 13.57 Depth-To-Bottom T/PVC (ft) 96.17 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
12:52							188	13.57	
12:57	8.26	17.1	974	18.7	1.74	-0.2	188	13.57	3.66
13:02	7.66	16.9	969	7.1	0.68	-22.2	188	13.57	5.96
13:07	7.50	17.0	968	5.1	0.49	-34.9	188	13.57	6.10
13:12	7.50	17.0	969	4.6	0.44	-39.8	188	13.57	6.03
13:17	7.49	17.0	966	4.1	0.40	-40.9	188	13.57	6.14
13:22	7.48	17.2	970	3.9	0.38	-42.0	188	13.57	6.19
13:27	7.49	17.1	968	3.8	0.36	-44.1	188	13.57	6.25
13:28	Collected sample								
13:31	Sample stop time								

Total Pump Time (min): 36 Total Purge Volume (gal) : ~2 Reviewed by:

Weather: 67°F, Sunny, light wind Review Date: 10-19-22

Comments:

Bottles Filled			Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____						
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125 mL	HDPE	A	N					
1	250 mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

Laboratory Services

Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID 1509 Date 10-6-22 Control Number 22-1059-05

Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: Solinst S/N: 501491

QC SAMPLE: ☐ **MS/MSD** ☐ **DUP**____ **Sonde ID:** ☐ 15H ☐ 19M ☑ 20G ☐ 21G

Depth-to-water T/PVC (ft) 12.53 Depth-To-Bottom T/PVC (ft) _____ Completed by CGT

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*<0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1211							200	12.61	
1213	7.77	15.7	877	18.9	1.80	-13.3	200	12.61	3.48
1218	7.72	15.5	870	5.1	0.51	-39.4	200	12.61	3.59
1223	7.71	15.7	868	4.2	0.41	-45.4	200	12.61	3.53
1228	7.70	15.7	864	3.7	0.36	-53.9	200	12.61	4.96
1233	7.70	15.6	869	3.5	0.35	-56.4	200	12.61	5.15
1238	7.69	15.6	866	3.5	0.34	-58.7	200	12.61	3.79
1243	7.69	15.5	867	3.4	0.34	-59.5	200	12.61	3.74
1244									
1247									

Total Pump Time (min): 36 Total Purge Volume (gal) : ≈ 2 gal Reviewed by: JF

Weather: _____ Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	〃	〃	〃	〃					
1	250mL	〃	〃	〃					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Consumers Energy Company
Monitoring Well Sampling Worksheet

Well ID 15006 Date 10-6-22 Control Number 22-1059-06

Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: solinst S/N: 501491

QC SAMPLE: ☐ MS/MSD ☐ DUP____ Sonde ID: ☐ 15H ☐ 19M ☑ 20G ☐ 21G

Depth-to-water T/PVC (ft) 4.14 Depth-To-Bottom T/PVC (ft) _____ Completed by CES

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1126							200	4.77	
1128	7.66	14.5	970	4.2	0.63	-13.9	200	4.77	7.16
1133	7.62	14.5	969	4.1	0.4	-62.7	200	4.77	8.36
1138	7.59	14.6	968	3.7	0.37	-114.0	200	4.77	8.98
1143	7.59	14.5	966	3.2	0.33	-149.9	200	4.77	4.00
1148	7.61	14.4	969	3.0	0.31	-161.6	200	4.77	5.62
1153	7.63	14.5	968	2.9	0.30	-166.6	200	4.77	6.15
1158	7.64	14.5	968	2.9	0.29	-170.0	200	4.77	4.98
1159									
1207									

Total Pump Time (min): 41 Total Purge Volume (gal): ≈ 2.5 gal Reviewed by: [signature]

Weather: _____ Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	250mL	HDPE	A	N					
3	125mL	"	"	"					
3	1	"	B	"					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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WATER LEVEL DATA

Site: Whiting
Project No: 22 1060
Analyst: MLR
Date: 10/6/22
Method:
Tape ID: ~~Solinst~~ MLR 10/4/22 Geo Tech **S/N:** 100922

Reviewed by: [signature]
Review Date: 10-19-22

Well ID	Time	DTW Trial 1 (ft)	DTW Trial 2 (ft)	DTB (ft)	Remarks
JRW MW-15001					
JRW MW-15002					
JRW MW-15003					
JRW MW-15004					
JRW MW-15005					
JRW MW-15006					
JRW MW-16001	1041	16.58	16.58	85.0	marked TOC
JRW MW-16002	1049	12.93	12.93	96.0	marked TOC
JRW MW-16003	1057	13.24	13.24	87.84	marked TOC
JRW MW-16004	1104	13.60	13.59	90.10	marked TOC
JRW MW-16005	1030	16.40	16.40	93.01	marked TOC
JRW MW-16006	1011	15.25	15.25	93.18	marked TOC
JRW MW-16007					marked TOC
JRW MW-16008					marked TOC
JRW MW-16009					marked TOC

NOTES: *TOC reference point*
DTW = Depth to Water
DTB = Depth to Bottom

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Monitoring Well Sampling Worksheet

Well ID JRW MW-1600 Date 10/5/22 Control Number 22-1060-01
Location pond 6 Well Material: ☐ PVC ☐ SS ☐ Iron ☐ Galv. Steel
10/6/22 MLR
Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer
Depth to Water Tape: S/N:

QC SAMPLE: ☐ MS/MSD ☒ DUP MLR 10/5/22 Sonde ID: ☐ 15H ☐ 19M ☐ 20G ☐ 21G

Depth-to-water T/PVC (ft) _____ Depth-To-Bottom T/PVC (ft) _____ Completed by _____

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1235	10.91	14.3	685	40.5	4.07	-57	200		43.19
1240	10.89	14.4	693	32.8	3.29	-47.1	200		35.02
1245	10.89	14.5	693	31.9	3.19	-41.4	200		54.90
1250	flushed	sonde - turbidity high							NA
1255	10.87	14.6	692	31.8	3.18	-30.4	200		19.1
1300	10.86	14.7	693	34.1	3.42	-24.6	200		6.43
1305	10.86	14.6	694	33.8	3.36	-24.4	200		6.90
1310	10.86	14.6	695	33.7	3.36	-24.3	200		6.39
1315	Sampled								

Total Pump Time (min): 40 min Total Purge Volume (gal) : ~ 2.1 Reviewed by: J
Weather: _____ Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
MLR 10/5/22 Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1 2	250	P	A	N					
1 2	125	P	A	N					
1 2	125	P	B	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW MW16002 Date 10/6/22 Control Number 22-1060-02
Location Pond 6 Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel

Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer

Depth to Water Tape: S/N:

QC SAMPLE: ☐ MS/MSD ☐ DUP____ **Sonde ID:** ☐ 15H ☑ 19M ☐ 20G ☐ 21G

Depth-to-water T/PVC (ft) 12.93 Depth-To-Bottom T/PVC (ft) 96.0 Completed by MLR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1335	8.13	14.7	933	13.7	1.36	-121.8	220	12.93	5.17
1340	7.92	14.6	991	11.9	1.18	-122.1	220	12.93	4.60
1345	7.84	14.6	1019	11.3	1.12	-114.8	220	12.93	7.43
1350	7.78	14.6	1022	11.6	1.16	-113.2	220	12.93	7.07
1355	7.77	14.6	1025	11.5	1.1	-110.1	220	12.93	7.34
1400	Sampled								

Total Pump Time (min): 25min Total Purge Volume (gal) : ~ 1.4 Reviewed by:

Weather: 58° Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	250	P	A	N					
1	125	P	A	N					
1	125	P	B	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW - MW-16003 Date 10/6/22 Control Number 22-1060-03

Location Pond 6 Well Material: [✓] PVC [ ] SS [ ] Iron [ ] Galv. Steel

Purge Method: [✓] Peristaltic [ ] Submersible [ ] Bladder [ ] Fultz [ ] Bailer

Depth to Water Tape: S/N:

QC SAMPLE: [✓] MS/MSD [ ] DUP____ Sonde ID: [ ] 15H [✓] 19M [ ] 20G [ ] 21G

Depth-to-water T/PVC (ft) 13.24 Depth-To-Bottom T/PVC (ft) _____ Completed by MLK

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1415	7.74	14.6	1018	11.0	1.10	-97.6	220	13.24	3.93
1420	7.74	14.4	1019	4.0	0.40	-126.6	220	13.24	5.90
1425	7.74	14.4	1017	3.8	0.38	-128.9	220	13.24	6.30
1430	7.74	14.7	1018	3.6	0.36	-130.8	220	13.24	6.28
1435	sampled								

Total Pump Time (min): 20min Total Purge Volume (gal) : ~ 1.2 Reviewed by: JT

Weather: 58° Sunny Review Date: 11-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	250	P	A						
3	125	P	A						
3	125	P	B						

* *Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID 16004 Date 10-5-22 Control Number 22-1060-04
Location JR Whiting Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel
Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer
Depth to Water Tape: Solinst S/N: 501491

QC SAMPLE: ☐ **MS/MSD** ☐ **DUP**____ **Sonde ID:** ☐ 15H ☐ 19M ☑ 20G ☐ 21G

Depth-to-water T/PVC (ft) 13.56 Depth-To-Bottom T/PVC (ft) _____ Completed by CET

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1407							200	13.62	
1409	8.17	15.3	925	72.7	7.28	48.0	200	13.62	5.16
1414	8.35	14.3	953	57.6	5.86	14.7	200	13.62	2.82
1419	8.29	14.1	982	50.3	5.14	12.5	200	13.62	2.92
1424	8.05	14.3	1088	17.3	1.75	1.1	200	13.62	5.29
1429	7.94	14.2	1113	6.9	0.70	-29.7	200	13.62	6.32
1434	7.92	14.3	1113	6.2	0.63	-36.6	200	13.62	6.47
1439	7.89	14.1	1118	5.6	0.58	-59.0	200	13.62	7.62
1444	7.85	14.1	1123	5.5	0.56	-61.9	200	13.62	7.83
1449	7.81	14.2	1125	5.5	0.55	-67.1	200	13.62	6.88
1450	Sampled								
1455									

Total Pump Time (min): 48 Total Purge Volume (gal) : ≈ 2.5 gal Reviewed by:
Weather: _____ Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	250 mL	HDPE	A	N					
1	125 mL	〃	〃	〃					
1	1 L	〃	B	〃					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW-MW-16005 Date 10/5/22 Control Number 22-1060-05
Location Pond 6 Well Material: ☑ PVC ☐ SS ☐ Iron ☐ Galv. Steel
MLR 10/6/22
Purge Method: ☑ Peristaltic ☐ Submersible ☐ Bladder ☐ Fultz ☐ Bailer
Depth to Water Tape: S/N:

QC SAMPLE: ☐ MS/MSD ☑ DUP 02 Sonde ID: ☐ 15H ☑ 19M ☐ 20G ☐ 21G

Depth-to-water T/PVC (ft) 16.40 Depth-To-Bottom T/PVC (ft) 93.01 Completed by MLR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1135	7.46	14.3	907	25.8	2.59	-16.7	200	16.40	6.11
1140	7.61	14.1	908	17.3	2.57	-34.3	200	16.40	13.89
1145	7.67	14.2	908	5.6	2.03	-77.1	200	16.40	17.32
1150	7.66	14.2	908	3.9	1.67	-80.3	200	16.46	12.61
1155	7.67	14.3	909	3.9	1.13	-100.2	200	16.46	13.84
1200	7.67	14.3	909	3.8	0.59	-101.1	200	16.46	19.78
1205	7.67	14.3	910	3.7	0.57	-101.9	200	16.46	6.86
1210	7.67	14.1	911	3.8	0.38	-103.3	200	16.40	6.92
1215	7.67	14.0	910	3.8	0.39	-103.8	200	16.40	7.03
1220	Sampled								

Total Pump Time (min): 45 min Total Purge Volume (gal) : ~ 2.4 Reviewed by:
Weather: 58° Sunny Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
2	250	P	A	N					
2	125	P	A	N					
2	125	P	B	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW-MW-160006 Date 10/6/22 Control Number 22-1060-06
Location JRW Well Material: [V] PVC [ ] SS [ ] Iron [ ] Galv. Steel

Purge Method: [V] Peristaltic [ ] Submersible [ ] Bladder [ ] Fultz [ ] Bailer

Depth to Water Tape: Solinst 101 S/N: 379851

QC SAMPLE: [ ] MS/MSD [ ] DUP____ Sonde ID: [ ] 15H [ ] 19M [ ] 20G [V] 21G

Depth-to-water T/PVC (ft) 15.21 Depth-To-Bottom T/PVC (ft) 93.18 Completed by KDR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
14:14							200	15.24	
14:19	8.73	15.4	813	53.0	5.25	26.0	200	15.24	1.98
14:24	7.60	14.6	804	44.6	4.53	44.4	200	15.24	1.89
14:29	7.47	14.5	805	40.7	4.13	40.7	200	15.24	1.95
14:34	7.44	14.6	808	34.1	3.45	17.8	200	15.24	2.17
14:39	7.40	14.7	813	23.6	2.39	-21.6	200	15.24	2.31
14:44	7.45	14.6	820	11.9	1.19	-71.5	200	15.24	2.46
14:49	7.47	14.5	822	8.4	0.85	-105.5	200	15.24	2.62
14:54	7.47	14.4	824	7.4	0.75	-115.1	200	15.24	2.68
14:59	7.52	14.2	823	6.5	0.66	-123.4	200	15.24	2.72
15:04	7.54	14.4	825	5.9	0.60	-128.8	200	15.24	2.80
15:09	7.57	14.1	825	5.9	0.60	-131.2	200	15.24	2.88
15:10	Collected sample								
15:13	Sample stop time								

Total Pump Time (min): 56 Total Purge Volume (gal) : ≈ 3.0 Reviewed by:
Weather: 65°F, Sunny, windy Review Date: 10-19-22

Comments:

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	125mL	HDPE	B	N					
1	125mL	HDPE	A	N					
1	250mL	HDPE	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*

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Monitoring Well Sampling Worksheet

Well ID JRW MW-16001 Date 11/3/22 Control Number 22-1060-01 Resampled
Location Pond 6 Well Material: [X] PVC [ ] SS [ ] Iron [ ] Galv. Steel

Purge Method: [X] Peristaltic [ ] Submersible [ ] Bladder [X] Fultz [ ] Bailer
Depth to Water Tape: Solonist S/N: 379851

QC SAMPLE: [ ] MS/MSD [ ] DUP____ Sonde ID: [ ] 15H [ ] 19M [X] 20G [ ] 21G

Depth-to-water T/PVC (ft) 16.72 Depth-To-Bottom T/PVC (ft) 84.66 Completed by MLR

Time	pH	Temp	Sp Cond	DO	DO	ORP	Pump Rate	Water level	Turbidity
min	units	°C	uS/cm	% sat.	ppm	mV	mL/min	Drawdown ft	NTU
3-5 min	*+/- 0.1*	*NA*	*+/- 3%*	*+/- 10%*	*+/- 0.3ppm*	*+/- 10mV*	*	*< 0.33*	*+/- 10%*
Stablization parameters for the last three readings									
1155	9.71	15.1	630	72.5	7.28	73.4	120	16.72	20.44
1200	10.04	14.6	640	36.0	3.65	45.6	120	16.72	17.49
1201	hooked up Fultz pump - high purge								
1210	9.53	14.5	689	11.5	1.17	43.0	120+2000	16.72	18.43
1225	9.38	14.5	699	9.5	0.96	50.1	120+2000	16.73	33.72
1300	9.04	15.0	665	15.6	1.57	47.9	120+2000	16.73	60.61
1330	8.81	14.8	715	12.5	1.27	49.4	120+2000	16.74	53.58
1345	Disconnected Fultz pump								
1355	Flushed Sonde								
1410	7.95	14.8	778	6.0	0.61	54.4	120	16.74	5.46
1415	7.95	15.3	780	8.8	0.91	59.8	120	16.74	9.56
1420	7.94	15.2	779	4.7	0.47	57.9	120	16.74	7.78
1425	7.94	15.3	781	4.3	0.43	62.1	120	16.75 MLR 11/3/22	7.06
1430	7.94	15.3	780	4.3	0.42	65.3	120	16.75	7.30
1435	7.93	15.3	779	4.2	0.40	66.9	120	16.75	7.19

MLR 11/3/22

Total Pump Time (min): 165 Total Purge Volume (gal): ~61 gal Reviewed by:
Weather: Review Date: 11-07-22

Comments: 1440 Sampled

Bottles Filled		Preservative Codes: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCl F - _____							
Quantity	Size	Type	Preservative Code	Filtered Y/N	Quantity	Size	Type	Preservative Code	Filtered Y/N
1	1Qt	P	A	N					

** Pump rate should be <500 mL/min for low-flow and <1 gal/min for high Volume.*