January 30, 2023 ***TRANSMITTAL VIA EMAIL 01/30/2023***

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

SUBJECT: 2022 Annual Groundwater Monitoring and Corrective Action Report
DE Karn Lined Impoundment Coal Combustion Residuals (CCR) Unit

Dear Ms. Babcock:

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) (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) Lined Impoundment at the DE Karn 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 the Karn Lined Impoundment to cover the period of January 1, 2022 to December 31, 2022.

This 2022 Karn Lined Impoundment 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 four quarterly groundwater monitoring events completed in 2021 for the Lined Impoundment. 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.

After establishing the groundwater monitoring system and detection monitoring project pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) December 28, 2018 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. This alignment would ensure compliance with the CCR standards through a state-approved

permitting program that would be deemed to be "equivalent to" or "as protective as" through an administrative application that would be reviewed and authorized by U.S. EPA.

On November 6, 2020 Consumers Energy submitted the Karn Lined Impoundment Hydrogeological Monitoring Plan (November 2020 HMP) 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 November 13, 2020 and the four quarterly events completed in 2022 were performed in accordance with the EGLE-approved HMP. This letter and four quarterly reports (Enclosures 2 through 5) collectively comprise the 2022 Annual Groundwater Monitoring and Corrective Action Report and meet the requirements of §257.90(e) as documented in the enclosed checklist (Enclosure 1).

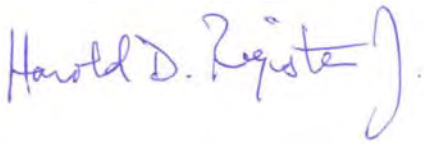
At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following SSIs over background limits:

- Chloride and total dissolved solids in DEK-MW-15003; and
- pH in monitoring well OW-11.

As detailed in the Fourth Quarter 2022 Hydrogeological Monitoring Report (Enclosure 5), a source other than the Karn Lined Impoundment CCR Unit caused the SSIs. As such, Consumers Energy will continue with the detection monitoring program at the Karn Lined Impoundment in conformance with §257.90 - §257.94.

No corrective actions were performed in 2022. Per the November 2020 HMP, quarterly monitoring will be performed at the Karn Lined Impoundment in 2022. The next annual monitoring report will cover monitoring conducted in the 2022 calendar year and will be submitted no later than January 31, 2024.

Sincerely,



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cc: Mr. Phil Roycraft, EGLE Saginaw Bay District Office
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Ms. Margie Ring, EGLE Lansing Office
Mr. Jim Arduin, EGLE Lansing Office
Mr. Caleb Batts, Consumers Energy
Ms. Darby Litz, TRC
Ms. Kristin Lowery, TRC
Mr. Jacob Krenz, TRC

Enclosures: 1) CCR Annual Groundwater Report Requirements: § 257.90(e). Checklist for the Karn Lined Impoundment CCR Unit.

2) First Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. (TRC; April 29, 2022)

3) Second Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. (TRC; July 27, 2022)

4) Third Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. (TRC; October 27, 2022)

5) Fourth Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. (TRC; January 30, 2023)

CCR Annual Groundwater Report Requirements: § 257.90(e)
Checklist for the Karn Lined Impoundment CCR Unit
2022 Annual Report

Requirement	Reference
At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:	
(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;	Figure 2 [2],[3],[4],[5]
(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;	Not Applicable - no installation or decommissioning
(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;	Section 3.2 [2],[3],[4],[5]
(4) A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and	Annual Report [1]; Section 1.2 Program Summary [2],[3],[4],[5]
(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.	Certified ASD[2],[5]
(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:	
(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;	Section 1.2 Program Summary [2],[3],[4],[5]
(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;	Section 1.2 Program Summary [2],[3],[4],[5]
(iii) If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):	Section 4.3 Alternate Source Demonstration[2],[3],[4],[5]; Certified ASD[2],[5]
(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	Certified ASD[2],[5]; remaining in Detection Monitoring
(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Not Applicable; Detection Monitoring
(iv) If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:	Not Applicable; Detection Monitoring
(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	Not Applicable; Detection Monitoring
(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Not Applicable; Detection Monitoring
(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not Applicable; Detection Monitoring
(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Not Applicable; Detection Monitoring
(v) Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not Applicable; Detection Monitoring
(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.	Not Applicable; Detection Monitoring

Notes:

(1) *2022 Annual Groundwater Monitoring and Corrective Action Report Karn Lined Impoundment Coal Combustion Residuals CCR Unit.* Consumers Energy. January 30, 2023.

(2) *First Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan.* TRC. April 29, 2022.

(3) *Second Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan.* TRC. July 27, 2022.

(4) *Third Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan.* TRC. October 27, 2022.

(5) *Fourth Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan.* TRC. January 30, 2023.

First Quarter 2022 Hydrogeological Monitoring Report

DE Karn Lined Impoundment CCR Unit

Essexville, Michigan

April 2022

Prepared For:

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Prepared By:

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APPENDICES

1.0 Introduction

Pursuant to the Federal CCR Rule[1], Consumers Energy initiated a detection monitoring program for the Karn Lined Impoundment that went into service on June 7, 2018. After establishing the groundwater monitoring system and detection monitoring project pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) on December 28, 2018 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 amendments to the solid waste statute amended state groundwater monitoring requirements for coal ash impoundments; therefore, Consumers Energy submitted the *Karn Lined Impoundment Hydrogeological Monitoring Plan* (HMP) 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 November 13, 2020 and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9629 issued on December 10, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This First Quarter 2022 Karn Lined Impoundment Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring requirements during the active life of the coal ash impoundment. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, *Format for Solid Waste Disposal Facility Monitoring Submittals*, dated July 5, 2013. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the facility's approved HMP that was approved by the EGLE on November 13, 2020. This HMP is compliant with the requirements set forth in Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Protection Act (NREPA), also known as Part 115 of PA 451 of 1994, as amended (Part 115) (a.k.a., Michigan Part 115 Solid Waste Management).

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the First Quarter 2022 at the Karn Lined Impoundment located at 2742 Weadock Highway in Essexville, Michigan (Figure 1). Groundwater in the vicinity of the Karn Lined Impoundment has been documented to be affected by the management of CCR prior to the construction of the unit (January 2019, TRC). Given that the constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, the compliance monitoring program for the Karn Lined Impoundment consists of two parts to evaluate if there are new releases from the unit:

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

1. Monitoring of secondary collection system flow rates and water quality to detect leaks in the liner; and
2. Groundwater monitoring to determine if there are potential new releases from the Karn Lined Impoundment.

Based on sampling results for the first quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP.

1.3 Site Overview

The Karn Lined Impoundment is located within the DE Karn Power Plant site (Site) located north of the former JC Weadock Power Plant, east of the Saginaw River, south and west of Saginaw Bay (Figure 1). Two coal-fired power generating units (Karn Units 1 & 2) began generating electricity in 1958 and 1959, respectively. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled. Two other areas of coal ash management within the Karn site are the former Karn Bottom Ash Pond that was closed by removal and the Karn Landfill that was certified closed and now in post-closure care.

1.4 Geology/Hydrogeology

The majority of the Karn Lined Impoundment area is comprised of surficial CCR and sand fill, as described in the HMP. USGS topographic maps and aerial photographs dating back to 1938, in addition to field descriptions of subsurface soil at the site, indicate that the site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

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

The Site is bound by several surface water features (Figures 1 and 2): the Saginaw River to the west, Saginaw Bay (Lake Huron) to the north and east, and a discharge channel to the south. In general, shallow groundwater is encountered at a similar or slightly higher elevation relative to the surrounding surface water features. Groundwater flow in the upper aquifer is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay. In the vicinity of the Karn Lined Impoundment, the shallow groundwater flow is generally radial, with a potentiometric high point near the unlined ditch north of the Karn Lined Impoundment and near DEK-MW-15003, flowing outward toward the surrounding surface water bodies.

2.0 Second Collection System Monitoring

Consumers Energy initiated secondary collection system flow monitoring to comply with the EGLE-approved HMP in December 2020. The SCS serves as a leak detection system and the SCS flow rate data is used to demonstrate compliance with Part 115. Consumers Energy continues to comply with the requirements for unmonitorable units under Rule 437 of the Part 115 Rules.

The Average Daily Flow Rate for the period from December 10, 2020 – January 6, 2021 was calculated as 137.0 gallons per acre per day (GPAD), which exceeded the Response Action Flow Rate of 25 GPAD. Although this calculated flow rate does not constitute the average flow rate for the previous three months per the definition of average daily flow rate under Part 115, Consumers provided a proactive notification and a preliminary written assessment of the flow rate exceedances to the EGLE January 15, 2021 and January 22, 2021, respectively. The use of secondary collection system flow rates as a leak detection system was successful. Increased flow rates triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. Following repairs to the liner, Consumers Energy continues to monitor improvements in the secondary collection system for improvements in the Daily Average Flow Rate. The Average Daily Flow Rate for March 2022 was calculated as 20.0 gallons per acre per day (GPAD) and demonstrates that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021,as documented in the Consumers Energy Notification of Secondary Flow Rates, DE Karn Lined Impoundment (Type III Coal Ash Impoundment) WDS #392503 (Consumers Energy, April 7, 2021).

In response to the exceedance of the SCS Response Action Flow Rate), samples were collected from the surface water of the primary collection system (KLI-PCS) and from the secondary leachate collection system sump (KLI-SCS) in February 2022 to compare leachate chemistry to groundwater chemistry. The samples were analyzed for the following constituents:

- Primary Indicator Parameters: Section 11511a(3)(c) - Detection Monitoring Constituents
- Alternative Indicator Parameters: Section 11519b(2) - Assessment Monitoring Constituents
- Optional Analyses in support of Piper or Stiff diagrams

The KLI-PCS and KLI-SCS data were evaluated for comparison to groundwater quality and water chemistry and to also assess potential of hazard and mobility of constituents. A series of time-series plots are included in Appendix E to illustrate water quality data changes over time for the secondary collection system from the start of operation in June 2018 to present. This analysis demonstrates that each monitored constituent is generally present at concentrations less than the Groundwater Protection Standard (GWPS) established under 40 CFR 257.95(h) or generic groundwater surface water interface (GSI) criteria adopted by the Department pursuant to Section 20120a, with the exception of total dissolved solids and chloride. A few notable observations:

- **Arsenic concentrations are higher in groundwater than the secondary collection system:** Arsenic was detected in both the primary and secondary collection systems at a

concentration of 2 ug/L, in February 2022. In contrast, the arsenic concentration observed in OW-12, the monitoring well located closest to the damaged liner areas, is 120 ug/L, which is consistent with concentrations observed in August 2020, before the liner damage occurred. Arsenic present in groundwater does not appear to be a result of a release from the unit.

- **Vanadium is detected in the primary and secondary collection system and not in groundwater**: Vanadium was present in the primary collection system sample at 23 ug/L in October 2021 and 24 ug/L in February 2022, which are higher than the vanadium concentrations in the secondary collection system (7 ug/L in October 2021 and 6 ug/L in February 2022). Vanadium was not detected in the wells nearest the observed liner damage: OW-12 (<2 ug/L) or DEK-MW-18001 (<2 ug/L) providing additional evidence that a release has not adversely affected groundwater conditions.
- **Secondary Collection System chemistry has not appreciably changed:** The time series plots in Appendix E show relatively stable trends in chemistry for samples collected from the primary collection system, with the exception of TDS and sulfate. In both cases the concentration in the primary collection system leachate is significantly lower in concentration than the concentration in the secondary collection system leachate, suggesting that the elevated TDS and sulfate is not likely from the primary collection system leachate. The TDS and sulfate concentrations in the secondary collection system are also more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products.

Water quality data collected for First Quarter 2022 are included in the attached laboratory reports (Appendix A). Groundwater chemistry is discussed in Section 4.1. Groundwater conditions will continue to be monitored. Using the secondary collection system flow rates as a leak detection system was successful. The leak was identified in the fourth quarter of 2020, and actions were promptly taken to address the leak. In January 2021, liner damage was noted in two areas denoted as Visual Observation Point No. 1 (VOP 1) and Visual Observation Point No. 2 (VOP 2). VOP 2 was repaired on March 10, 2021 and VOP 1 was repaired on May 24, 2021 as documented by Golder Associates Inc. Consumers Energy submitted the repair certification reports to the EGLE on May 25, 2021 and June 29, 2021, respectively. The results of the mitigation efforts continue to be monitored and recent data demonstrate that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021.

Consumers Energy continues to monitor the secondary collection system flow rates, record flow rates and head level on the secondary liner in the operating record and evaluate flow rate trends on a weekly basis. Written notifications of flow rates in the secondary collection system will be provided monthly and evaluations of the chemical characteristics of liquid in the secondary collection system will be reported quarterly. In addition, Consumers Energy continues to provide quarterly updates on remedial actions performed on the leachate collection system through the quarterly groundwater monitoring report required by the HMP.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

In accordance with §257.91, Consumers Energy developed a groundwater monitoring system for the Karn Lined Impoundment prior to the initial receipt of waste in the CCR unit (TRC, 2018c). Given the radial groundwater flow direction and constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the Karn Bottom Ash Pond, the groundwater monitoring system design incorporates an *intrawell statistical approach* for detection monitoring as described in the HMP and in accordance with the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance" (USEPA, 2009). Five monitoring wells that are screened in the uppermost saturated unit were selected for the Karn Lined Impoundment HMP detection monitoring (DEK-MW-15003, DEK-MW-18001, OW-10, OW-11, and OW-12). Monitoring well locations are shown on Figure 2.

3.2 February and March 2022 Detection Monitoring Event

In accordance with the HMP, TRC conducted the first quarter 2022 monitoring event for the Karn Lined Impoundment on February 28th and March 1st, 2022. In addition to the routine groundwater samples collected from the monitoring well network, a water sample was collected from a sump in the secondary collection system (KLI-SCS) and a surface water sample was collected from the primary collection system (KLI-PCS), as discussed in Section 2 above, such that leachate chemistry could be compared to groundwater chemistry. A sample of surface water was also collected from a ditch located north of the lined impoundment (SW-Ditch) to further evaluate site geochemistry (Figure 2). The SW-Ditch surface water grab sample represents water quality from the potentiometric high point adjacent to the Karn Lined Impoundment.

Groundwater samples collected during the February and March 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	Section 11519b(2) – Assessment Monitoring Constituents		
Boron	Antimony	Fluoride	Thallium
Calcium	Arsenic	Lead	Vanadium
Chloride	Barium	Lithium	Zinc
Fluoride	Beryllium	Mercury	
Iron	Cadmium	Molybdenum	
pH	Chromium, total	Nickel	
Sulfate	Cobalt	Selenium	
Total Dissolved Solids (TDS)	Copper	Silver	

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, and bicarbonate, carbonate, and total alkalinity to provide additional evaluation of groundwater chemistry. Analytical results from the first quarter 2022 monitoring event are included in the attached laboratory reports (Appendix A).

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

Monitoring wells were purged with peristaltic pumps utilizing low-flow sampling methodology. Field parameters were stabilized at each monitoring well prior to collecting groundwater samples. Stabilized field parameters for each monitoring well are summarized in Table 2. Field notes are included as Appendix B. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Porewater sample preparation and analyses were performed in accordance with SW-846 "Test Methods for Evaluation Solid Waste – Chemical / Physical Methods," USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of one field blank, one equipment blank, one field duplicate (OW-12), and field matrix spike/matrix spike duplicate samples collected at DEK-MW-18001.

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the HMP program. The data quality reviews for the Karn Lined Impoundment network wells are summarized in Appendix C.

3.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the first quarter 2022 groundwater monitoring event are provided in Table 1. The data were used to construct the groundwater contour map (Figure 3).

Groundwater elevations measured at the site in February 2022 are generally within the range of 577 to 586 feet above mean sea level (ft NAVD88) and groundwater is typically encountered at equal elevation relative to the surrounding surface water features measured by the NOAA gauging station data or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although the point source discharge of sluiced bottom ash into the former Karn Bottom Ash Pond historically created localized mounding of the potentiometric surface, the new Karn Lined

Impoundment went into service on June 7, 2018 and has been continuously collecting the process water and bottom ash that went into the former bottom ash pond. Since the former bottom ash pond is no longer being hydraulically loaded with sluiced ash and has been dewatered by gravity, the characteristic groundwater mound centered within the former surface pool area is no longer present. The groundwater elevation data collected in February 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to measurement taken in June 2018. Groundwater at the Site is locally influenced by incidental infiltration from precipitation over the uncovered acreage and the unlined low volume miscellaneous wastewater conveyance associated with the permitted NPDES discharge system, which is located just north of the Karn Lined Impoundment. Monitoring wells OW-11 and DEK-MW-15003 delineate the newly established groundwater elevation high point that was previously centered over the former Karn Bottom Ash Pond with porewater flow generally flowing radially towards the adjacent surface water features from this newly established potentiometric “high”, as illustrated in Figure 3.

The average hydraulic gradient observed on February 28, 2022 in the vicinity of the former Karn Bottom Ash Pond and Karn Lined Impoundment is estimated at 0.0051 ft/ft. The gradients were calculated using the monitoring well pair DEK MW 15004/DEK-MW-15005, as well as the well water elevation difference and distance between DEK-MW-15003 and the discharge channel. The discharge channel surface water elevation was taken from the NOAA gauging station data on the same date as the water level measurements. Using the mean hydraulic conductivity of 15 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.3, the estimated average seepage velocity was calculated to be 0.26 ft/day or 93 ft/year in February 2022 which is reduced relative to previous estimated seepage velocities (e.g., 0.33 ft/day or 120 ft/year August 2018).

Due to the operational changes of the former bottom ash pond and the completion of the landfill capping activities in 2020, the gradient between the area of the Karn Bottom Ash Pond and Karn Lined Impoundment and the surrounding surface water bodies is flattening out as compared to previous quarters and is also attempting to reach a new equilibrium, as expected. The general flow direction relative to the Karn Lined Impoundment is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III/IV parameters that could potentially migrate from the Karn Lined Impoundment.

4.0 Data Evaluation

Based on sampling results for the first quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP. The following section summarizes the statistical approach applied to assess the first quarter 2022 groundwater data in accordance with the detection monitoring program.

Water quality data are included in the attached laboratory reports (Appendix A). Groundwater analytical data for the most recent quarterly monitoring event is summarized in Table 3 along with the associated Part 201 generic drinking water criteria, the generic GSI criteria, and the site-specific mixing-zone GSI criteria. Mixing-zone criteria are provided for the Karn-Weadock complex in the December 23, 2015 mixing zone determination that consists of arsenic, boron, and selenium. As such, arsenic, boron, and selenium are compared to site-specific mixing zone-based GSI criteria, and all other constituents are screened against generic GSI criteria. GSI compliance is evaluated through monitoring performed at the Karn Landfill in accordance with the EGLE-approved Consumers Energy's revised Karn Landfill HMP (Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area) dated December 19, 2017.

4.1 Statistical Evaluation of Trends

Groundwater in the vicinity of the Karn Lined Impoundment has been affected by CCR management before commencement of operation (January 2019, TRC). Given that the constituents associated with CCR currently managed in the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, intrawell trend tests, in conjunction with KLI-SCS flow rates, will be utilized to assess whether a release has occurred from operation of the unit. The detection monitoring constituent concentrations will be analyzed using Mann-Kendall and Sen's Slope trend tests to determine if there is an upward trend that may indicate a release from the Karn Lined Impoundment. The data will be analyzed in the context of the Site hydrogeologic characteristics and an assessment made as to whether the source of an upward trend, if identified, is from a possible release from the Karn Lined Impoundment, another on-site release, or on-site migration of nearby impact (i.e., former Karn Bottom Ash Pond).

Time-series plots and statistical trend analyses are used to evaluate groundwater quality each quarter, which are included as Appendix D. Consumers Energy manages and evaluates its analytical data using Sanitas™ Statistical Software (Sanitas™). Consumers Energy conducts intra-well trend analyses to examine data for each monitoring well-constituent pair in the groundwater monitoring system over time to determine if changes in water quality are occurring that may be associated with the Karn Lined Impoundment. Data from May 2020 through February 2022 were analyzed using Mann-Kendall and Sen's Slope at a significance level (α) of 0.025 per tail for each constituent/sampling point dataset to assess trends. Sen's Slope estimator was used to assess the magnitude of the slope and the Mann-Kendall test was used to determine if the slope was statistically significant. The graphical output of the Sen's Slope/Mann-Kendall trend tests and time series are presented in Appendix D. Appendix D also includes a table summarizing these trends and the associated statistical trend charts.

Data trends for detection monitoring constituents are generally stable (i.e., no trend) or declining for the majority of the monitoring well/constituent pairs with the following exceptions:

- The increasing trend in chloride concentrations first observed in monitoring well DEK-MW-15003 in Q4 2021 was confirmed in Q1 2022.
- An increasing trend in sulfate concentrations continued to be observed in monitoring well DEK-MW-18001.
- A new, unconfirmed trend in iron concentrations was observed in DEK-MW-18001.
- Continuous increasing trends were observed for boron and pH in monitoring well OW-11.

4.2 Detection Monitoring Data Discussion

Groundwater quality is generally consistent with previous monitoring events and the majority of the well/constituent pairs are exhibiting no trend or decreasing concentrations. Although increasing trends of detection monitoring (Appendix III) constituents exist, the groundwater conditions do not conclusively indicate a release from the unit, as discussed further in Section 4.3. The location of one of the identified liner damage locations was approximately 40-ft upgradient from monitoring well OW-12 and the second location was approximately 130-ft upgradient from monitoring well DEK-MW-18001. Both leaks have been repaired. Detection monitoring constituent concentrations at OW-12, located closest to the identified liner damage, exhibit no statistically significant increasing trends, indicating that if a release to groundwater occurred due to the apparent leak in the liner system, the effects on local groundwater quality at this point appear to be negligible. The increasing trends at noted in section 4.1 will continue to be evaluated within context of changes in the site operational status.

4.3 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed in the Second Quarter 2021 Hydrogeological Monitoring Report (TRC, July 2021):

- Sulfate in monitoring well DEK-MW-18001; and
- Boron and pH in monitoring well OW-11.

The ASD has been updated this quarter to include:

- Chloride in monitoring well DEK-MW-15003; and
- Iron in monitoring well DEK-MW-18001.

Although increasing trends of detection monitoring (Appendix III) constituents exist, as noted in Section 4.1, the groundwater conditions do not conclusively indicate a release from the unit for several reasons as detailed below.

Timing of Changes in Concentrations

Time-series plots included in Appendix F illustrate that the change in sulfate and iron at DEK-MW-18001 and chloride at DEK-MW-15003 are likely a result of changes in the groundwater flow regime or redox conditions as a result of the Bottom Ash Pond closure activities, rather

than a result of a release from the unit.

- The increasing concentrations of sulfate (DEK-MW-18001) began around the time of the dewatering and excavation that occurred in the adjacent Bottom Ash Pond area (April through July 2019), well before a leak in the Karn Lined Impoundment liner system was noted through the increase in the SCS daily average flow rate observed in December 2020; therefore, the recent increase in concentrations is not due to a release from the unit.
- Chloride at DEK-MW-15003 initially decreased after the Bottom Ash Pond closure activities. In early 2020, chloride concentrations began to increase and appear to be approaching the concentrations observed pre-construction. The slight increase in chloride began before the noted leak in the Karn Lined Impoundment liner system was observed; therefore, the recent increase in concentrations is not due to a release from the unit.
- Concentrations of iron observed in monitoring well DEK-MW-18001 are likely affected by both the increases in sulfate concentrations as well as changes in dissolved oxygen, rather than a release from the unit.
  - Iron concentrations initially decreased following the pond decommissioning activities and have more recently increased. Sulfate concentrations at DEK-MW-18001 were quite low prior to the Bottom Ash Pond closure activities. When appreciable amounts of sulfide are present (such as from a reduction of sulfate), iron concentrations can be reduced due to the precipitation of iron sulfides. If the amount of sulfide is reduced, such as if less sulfate is being converted to sulfide, this could result in increased iron concentrations.
  - When dissolved oxygen is greater than 1-2 mg/L, iron concentrations may be reduced, as iron occurs as Fe^{3+}, which is less soluble than Fe^{2+}. Conversely, decreases in dissolved oxygen, such as what was observed in October 2021 and February 2022 results in increased iron concentrations.

Groundwater Flow Direction

OW-11 and DEK-MW-15003 are not located downgradient of either area with noted liner damage, due to the position of the wells relative to the groundwater elevation high point, as shown in Figure 3. Furthermore, OW-11 has distinct chemistry as compared to the KLI-SCS data as shown in Table 3. Boron, which can be used as a conservative tracer, is nearly six times higher in OW-11 than what has been observed in the KLI-SCS samples. The pH observed at OW-11 is 2 standard units higher than what is observed in the KLI-SCS sample and other nearby wells, which indicate a source other than the Karn Lined Impoundment is influencing chemistry at OW-11.

Leachate Chemistry

Analysis of the KLI-PCS and KLI-SCS data provide additional lines of evidence to support a source other than the unit is contributing to groundwater conditions.

- Arsenic concentrations are higher in groundwater than in the secondary collection system; therefore, arsenic present in groundwater does not appear to be a result of a release from the unit (Section 2.0).
- Vanadium is detected in the primary and secondary collection system and not in groundwater in the wells nearest the observed liner damage OW-12 or DEK-MW-18001 (<2

ug/L), providing additional evidence that a release has not adversely affected groundwater conditions.

- As discussed in Section 2.0, the sulfate in the primary collection system leachate is significantly lower in concentration than in the secondary collection system leachate, suggesting that the elevated sulfate is more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products. Sulfate concentrations in groundwater are more similar to the secondary collection system leachate concentrations than the primary collection system leachate, indicating that the source of sulfate is related to regional groundwater conditions rather than the waste managed in the unit.
- An unconfirmed increasing trend of iron has been observed at DEK-MW-18001; however, iron concentrations in the groundwater are higher than in the secondary collection system; therefore, iron present in groundwater does not appear to be a result of a release from the unit.

5.0 Conclusions and Recommendations

Consumers Energy will continue the detection monitoring program for the Karn Lined Impoundment unit based on the data evaluations completed in Section 4.0 of this report in conformance with the Karn Lined Impoundment HMP. Although increasing trends for detection monitoring constituents were observed in three wells in 1Q 2022, these trends were found to not be a result of operation of the Karn Lined Impoundment. No SSIs over background limits were identified at the Karn Lined Impoundment during the February 2022 monitoring event. The use of secondary collection system flow rates as a leak detection system was successful. Increased flow rates observed in Q4 2020 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. The results of the mitigation efforts continue to be monitored and recent data demonstrate that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021. The second quarter monitoring event is scheduled for May 2022.

6.0 References

AECOM. October 30, 2009. Potential Failure Mode Analysis (PFMA) Report. DE Karn Electric Generation Facility Ash Dike Risk Assessment Essexville, Michigan. Prepared for Consumers Energy Company.

Consumers Energy. December 19, 2017. Hydrogeological Monitoring Plan, Rev. 3. DE Karn Solid Waste Disposal Area.

Natural Resource Technology. September 2005. Phase II Groundwater Discharge Evaluation at the Consumers Energy DE Kam and JC Weadock Solid Waste Disposal Areas.

TRC. January 2019. 2018 Annual Groundwater Report for the DE Karn Power Plant Bottom Ash Pond CCR Unit, Essexville, Michigan. Prepared for Consumers Energy Company.

TRC. November 2020. Karn Lined Impoundment Hydrogeological Monitoring Plan for the DE Karn Power Plant Lined Impoundment, Essexville, Michigan. Prepared for Consumers Energy Company.

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

USEPA. April 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 80 Federal Register 74 (April 17, 2015), pp. 21301-21501 (80 FR 21301).

USEPA. July 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435).

Tables

Table 1
Summary of Groundwater Elevation Data
DE Karn – RCRA CCR Monitoring Program
Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)	February 28, 2022	
				Depth to Water (ft BTOC)	Groundwater Elevation (ft)
DEK Bottom Ash Pond					
DEK-MW-15002	590.87	Sand	578.3 to 575.3	6.91	583.96
DEK-MW-15004	611.04	Sand	576.6 to 571.6	28.45	582.59
DEK-MW-15005	589.72	Sand	572.3 to 567.3	10.00	579.72
DEK-MW-15006	589.24	Sand	573.0 to 568.0	9.53	579.71
DEK Bottom Ash Pond & Karn Lined Impoundment					
DEK-MW-15003	602.74	Sand	578.8 to 574.8	16.96	585.78
DEK-MW-18001	593.47	Sand	579.2 to 574.2	8.53	584.94
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	6.95	584.63
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	22.25	585.65
OW-12	603.07	Silty Sand	584.2 to 579.2	17.27	585.80
DEK Nature and Extent					
MW-01	597.02	Sand	573.0 to 570.0	17.34	579.68
MW-03	597.30	Sand	569.8 to 566.8	17.68	579.62
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	9.57	579.87
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	18.24	580.54
MW-10	596.97	Sand	582.5 to 572.5	17.45	579.52
MW-12	598.60	Sand	583.9 to 573.9	18.88	579.72
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	14.48	579.89
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	16.19	579.61
MW-22	598.99	Ash/Sand	571.4 to 568.4	16.85	582.14
MW-23	595.57	Ash/Sand	576.9 to 571.9	13.95	581.62
DEK Static Water Level					
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	17.65	579.69
MW-04	598.01	NR	569.5 to 564.5	18.38	579.63
MW-17	597.91	Sand	577.0 to 574.0	13.37	584.54
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	26.70	582.52
MW-19	597.28	NR	572.1 to 567.1	17.50	579.78
MW-20	632.75	Sand	582.3 to 579.3	52.98	579.77
MW-21	632.91	Sand	587.1 to 584.1	51.38	581.53
OW-01	631.33	NR	572.5 to 567.5	53.52	577.81
OW-02	598.01	Fly Ash	579.4 to 576.4	15.73	582.28
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	18.31	579.63
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	10.28	579.93
OW-05	593.53	Sand	576.9 to 571.9	13.73	579.80
OW-06	603.95	NR	580.9 to 575.9	21.81	582.14
OW-07	596.41	Ash	583.3 to 580.3	14.36	582.05
OW-08	593.93	NR	581.0 to 576.0	10.90	583.03
OW-09	593.45	NR	585.5 to 580.5	10.25	583.20
OW-13	588.52	NR	579.5 to 574.5	4.40	584.12
OW-15	587.75	NR	572.8 to 567.8	4.62	583.13

Notes:

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

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

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

NR: Not Recorded

Table 2
Summary of Field Parameters: February - March 2022
First Quarter 2022 Quarterly Report
Karn Lined Impoundment - Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Karn Lined Impoundment							
DEK-MW-15003	2/28/2022	0.82	-214.6	8.1	360	15.9	3.2
DEK-MW-18001	3/1/2022	0.13	-82.3	7.5	624	8.1	7.8
KLI-PCS	2/28/2022	12.64	136.0	8.5	345	5.0	22.6
KLI-SCS	2/28/2022	6.62	54.3	7.5	1,216	6.8	3.6
OW-10	2/28/2022	0.80	-147.3	7.3	562	9.9	7.3
OW-11	3/1/2022	1.20	1.4	9.5	314	8.9	6.1
OW-12	2/28/2022	0.71	-173.8	7.3	627	11.3	7.1
SW-DITCH	2/28/2022	12.21	150.0	8.0	358	10.5	29.7

Notes:
mg/L - Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit.

Table 3
Summary of Groundwater Sampling Results (Analytical): February - March 2022
First Quarter 2022
Karn Lined Impoundment – Essexville, Michigan

					Sample Location:	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**	**KLI-SCS**	**KLI-PCS**	**SW-DITCH**
					Sample Date:	2/28/2022	3/1/2022	2/28/2022	3/1/2022	2/28/2022	2/28/2022	2/28/2022	2/28/2022
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	upgradient	downgradient		upgradient	downgradient	Supplemental		
Appendix III[(1)]													
Boron	ug/L	NC	**500**	**500**	4,000	**821**	**898**	**955**	**3,310**	**914**	**607**	406	111
Calcium	mg/L	NC	NC	NC	500[EE]	26.3	70.1	90.7	7.97	72.5	101	61.2	50.4
Chloride	mg/L	250**	250[E]	250[E]	**50**	**54.7**	**65.6**	**51.7**	**61.7**	**57.8**	**51.8**	47.6	46.4
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	3,250	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	500[EE]	37.2	193	3.51	22.0	150	**431**	51.4	24.1
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	262	**589**	448	219	**533**	**1,240**	333	320
pH, Field	SU	**6.5 - 8.5****	**6.5 - 8.5[E]**	**6.5 - 8.5[E]**	**6.5 - 9.0**	8.1	7.5	7.3	**9.5**	7.3	7.5	**8.5**	8.0
Appendix IV[(1)]													
Antimony	ug/L	6	6.0	6.0	**2.0**	< 1	< 1	< 1	**4**	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	**577**	**130**	6	**783**	**120**	2	2	2
Barium	ug/L	2,000	2,000	2,000	1,200	49	194	157	30	87	68	391	303
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	1	< 1	2	< 1	< 1	< 1	6	4
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	3,250	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Lithium	ug/L	NC	170	350	440	20	21	19	< 10	33	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	**73**	**210**	**120**	30	< 5	< 5	**231**	17	15	16	< 5
Selenium	ug/L	50	50	50	**5.0**	2	2	3	**6**	2	5	1	1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]													
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	225	**1,490**	**1,200**	82	**4,830**	168	**1,030**	**2,290**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	< 1	< 1	2	< 1	< 1	3	4	7
Nickel	ug/L	NC	100	100	120	< 2	4	6	3	4	7	5	5
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	**4.5**	**62**	**27**	< 2	< 2	**8**	**1,150**	< 2	**6**	**24**	**11**
Zinc	ug/L	5,000**	2,400	5,000[E]	260	< 10	< 10	< 10	< 10	< 10	< 10	< 10	12

Notes:

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

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

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

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.

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

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

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

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

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

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

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

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

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Statistical Exceedances – February - March 2022
Karn Lined Impoundment
Essexville, Michigan

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

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

Facility: Karn Lined Impoundment – WDS# 392503

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	1 Qtr. 2022 (**bold** >201)	4 Qtr. 2021 (**bold** >201)	3 Qtr. 2021 (**bold** >201)	2 Qtr. 2021 (**bold** >201)

No Exceedances

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
TRC - GIS

PROJECT:

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

TITLE:

SITE LOCATION MAP

DRAWN BY:	A. ADAIR
CHECKED BY:	J. KRENZ
APPROVED BY:	D. LITZ
DATE:	APRIL 2022
PROJ. NO.:	464095.0001
FILE:	464095-101-001.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\1_DEKARN\2022_MXDs\FEBRUARY_2022\464095-101-001.mxd -- Saved By: AADAIR on 4/27/2022, 12:37:23 PM

LEGEND

- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SECONDARY CONTAINMENT SUMP (KLI-SCS)
- PRIMARY CONTAINMENT SYSTEM SAMPLE (KLI-PCS)
- SURFACE WATER SAMPLE (SW-DITCH)
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02, MW-03/MW-04, OW-02/MW-22, AND OW-07/MW-23 AS THE WELLS ARE LOCATED WITHIN 15-FT OF EACH OTHER.

N

0 600 1,200 Feet

1 " = 600 '
1:7,200

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

TITLE:
SITE LAYOUT MAP

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 2**
DATE:	APRIL 2022		

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

FILE NO.: 464095-101-002.mxd

Plot Date: 4/27/2022, 12:41:35 PM by AADAIR – LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 269767\1 DEKARN\2022 MXDs\FEBRUARY 2022\464095-101-002.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

LEGEND

- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)
- GROUNDWATER ELEVATION CONTOUR (1' INTERVAL, DASHED WHERE INFERRED)
- *(580.50)* GROUNDWATER ELEVATION (FEET)
- *(NU)* NOT USED

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:

CONSUMERS ENERGY COMPANY
DE KARN POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE:

SHALLOW GROUNDWATER CONTOUR MAP FEBRUARY 2022

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 3**
DATE:	APRIL 2022		

1540 Eisenhower Place
Ann Arbor, MI 48108-3284
Phone: 734.971.7080
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FILE NO.: 464095-501-003.mxd

Plot Date: 4/28/2022, 09:15:48 AM by RSUEMNICHT - LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 26976711 DEKARN\2022 MXDs\FEBRUARY 2022\464095-501-003.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

Appendix A
Laboratory Analytical Reports

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: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: March 19, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN LINED IMPOUNDMENT – 2022 Q1

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0146

TRC Environmental, Inc. conducted groundwater monitoring at the DE Karn Lined Impoundment area on 02/28/2022 and 03/01/2022, for the 1st Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 03/01/2022 and 03/02/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

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

II. Methodology

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

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2022 DEK Lined Impoundment
Date Received: 3/1/2022 and 3/2/2022
Chemistry Project: 22-0146

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0146-01	DEK-MW-15003	Groundwater	02/28/2022 03:04 PM	DEK Lined Impoundment
22-0146-02	OW-10	Groundwater	02/28/2022 01:44 PM	DEK Lined Impoundment
22-0146-03	OW-11	Groundwater	03/01/2022 08:54 AM	DEK Lined Impoundment
22-0146-04	OW-12	Groundwater	02/28/2022 12:14 PM	DEK Lined Impoundment
22-0146-05	KLI-SCS	Groundwater	02/28/2022 10:20 AM	DEK Lined Impoundment
22-0146-06	KLI-PCS	Surface Water	02/28/2022 10:00 AM	DEK Lined Impoundment
22-0146-07	SW-DITCH	Surface Water	02/28/2022 09:31 AM	DEK Lined Impoundment
22-0146-08	DUP-KLI	Groundwater	02/28/2022 12:00 AM	DEK Lined Impoundment
22-0146-09	EB-KLI	Water	03/01/2022 09:15 AM	DEK Lined Impoundment
22-0146-10	FB-KLI	Water	02/28/2022 01:44 PM	DEK Lined Impoundment

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-0146-01
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 03:04 PM

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

Aliquot #: 22-0146-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	577		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	49		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	821		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	26300		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	1		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	225		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	20		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	4790		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	75		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	30		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	4920		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	2		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	48900		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-01-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/01/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/01/2022	AB22-0301-08

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

Aliquot #: 22-0146-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	54700		ug/L	1000.0	03/02/2022	AB22-0304-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-0146-01
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 03:04 PM

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

Aliquot #: 22-0146-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/01/2022	AB22-0304-03
Sulfate	37200		ug/L	1000.0	03/01/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-01-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	1940		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-01-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	262		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B

Aliquot #: 22-0146-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	84400		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Bicarbonate	84400		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	220		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3800		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5200		ug/L	1000.0	03/11/2022	AB22-0308-09

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0146-02
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0146-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	6		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	157		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	955		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	90700		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	2		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	2		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	1200		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	19		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	14600		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	160		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	6		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	7480		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	3		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	53500		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	8		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-02-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/01/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/01/2022	AB22-0301-08

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

Aliquot #: 22-0146-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	51700		ug/L	1000.0	03/02/2022	AB22-0304-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0146-02
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0146-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/01/2022	AB22-0304-03
Sulfate	3510		ug/L	1000.0	03/01/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-02-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	3050		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-02-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	448		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B

Aliquot #: 22-0146-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	339000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Bicarbonate	339000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	60		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	6300		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6800		ug/L	1000.0	03/11/2022	AB22-0308-09

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-0146-03
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 03/01/2022
Collect Time: 08:54 AM

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

Aliquot #: 22-0146-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	4		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	783		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	30		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	3310		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	0.3		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	7970		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	82		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	ND		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	1180		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	231		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	3		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	4680		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	6		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	64900		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	1150		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-03-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	145		ug/L	100.0	03/03/2022	AB22-0303-01
Nitrite	158		ug/L	100.0	03/03/2022	AB22-0303-01

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

Aliquot #: 22-0146-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	61700		ug/L	1000.0	03/04/2022	AB22-0304-03

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-0146-03
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 03/01/2022
Collect Time: 08:54 AM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous — **Aliquot #: 22-0146-03-C02-A02** — **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	3250		ug/L	1000.0	03/03/2022	AB22-0304-03
Sulfate	22000		ug/L	1000.0	03/04/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL — **Aliquot #: 22-0146-03-C03-A01** — **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	12100		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C — **Aliquot #: 22-0146-03-C04-A01** — **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	219		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B — **Aliquot #: 22-0146-03-C05-A01** — **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	84400		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Bicarbonate	15100		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Carbonate	69300		ug/L	10000.0	03/04/2022	AB22-0304-10

Sulfide, Total by SM 4500 S2D — **Aliquot #: 22-0146-03-C07-A01** — **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/07/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous — **Aliquot #: 22-0146-03-C08-A01** — **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	6400		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous — **Aliquot #: 22-0146-03-C09-A01** — **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6900		ug/L	1000.0	03/11/2022	AB22-0308-09

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-0146-04
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 12:14 PM

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

Aliquot #: 22-0146-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	120		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	87		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	914		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	72500		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	4830		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	33		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	27200		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	148		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	17		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	4		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	6260		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	2		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	55400		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-04-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-04-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/01/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/01/2022	AB22-0301-08

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

Aliquot #: 22-0146-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	57800		ug/L	1000.0	03/02/2022	AB22-0304-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-0146-04
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 12:14 PM

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

Aliquot #: 22-0146-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/01/2022	AB22-0304-03
Sulfate	150000		ug/L	1000.0	03/02/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-04-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	762		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-04-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	533		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B

Aliquot #: 22-0146-04-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	193000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Bicarbonate	193000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-04-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-04-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2400		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-04-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	2900		ug/L	1000.0	03/11/2022	AB22-0308-09

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-0146-05
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 10:20 AM

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

Aliquot #: 22-0146-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	2		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	68		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	607		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	101000		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	3		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	168		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	ND		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	35800		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	6		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	15		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	7		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	3090		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	5		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	302000		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	6		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-05-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-05-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1540		ug/L	100.0	03/01/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/01/2022	AB22-0301-08

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

Aliquot #: 22-0146-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	51800		ug/L	1000.0	03/02/2022	AB22-0304-03

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-0146-05
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 10:20 AM

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

Aliquot #: 22-0146-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/01/2022	AB22-0304-03
Sulfate	431000		ug/L	1000.0	03/02/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-05-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-05-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1240		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B

Aliquot #: 22-0146-05-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	519000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Bicarbonate	519000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-05-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-05-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	5600		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-05-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6000		ug/L	1000.0	03/11/2022	AB22-0308-09

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-0146-06
Matrix: Surface Water

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 10:00 AM

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

Aliquot #: 22-0146-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	2		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	391		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	406		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	61200		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	6		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	4		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	1030		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	ND		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	12900		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	18		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	16		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	5		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	5730		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	1		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	29100		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	24		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-06-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-06-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1350		ug/L	100.0	03/01/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/01/2022	AB22-0301-08

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

Aliquot #: 22-0146-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	47600		ug/L	1000.0	03/01/2022	AB22-0304-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-0146-06
Matrix: Surface Water

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 10:00 AM

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

Aliquot #: 22-0146-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/01/2022	AB22-0304-03
Sulfate	51400		ug/L	1000.0	03/01/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-06-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	247		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-06-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	333		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B

Aliquot #: 22-0146-06-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	160000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Bicarbonate	157000		ug/L	10000.0	03/04/2022	AB22-0304-10
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-06-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-06-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4500		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-06-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6000		ug/L	1000.0	03/11/2022	AB22-0308-09

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-0146-07
Matrix: Surface Water

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 09:31 AM

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

Aliquot #: 22-0146-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	2		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	303		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	111		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	50400		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	4		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	7		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	2290		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	1		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	ND		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	14400		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	40		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	5		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	6000		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	1		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	26900		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	11		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	12		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-07-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-07-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1430		ug/L	100.0	03/01/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/01/2022	AB22-0301-08

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

Aliquot #: 22-0146-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	46400		ug/L	1000.0	03/01/2022	AB22-0304-03

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-0146-07
Matrix: Surface Water

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 09:31 AM

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

Aliquot #: 22-0146-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/01/2022	AB22-0304-03
Sulfate	24100		ug/L	1000.0	03/01/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-07-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	238		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-07-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	320		mg/L	10.0	03/03/2022	AB22-0303-10

Alkalinity by SM 2320B

Aliquot #: 22-0146-07-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	159000		ug/L	10000.0	03/04/2022	AB22-0304-09
Alkalinity Bicarbonate	159000		ug/L	10000.0	03/04/2022	AB22-0304-09
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-09

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-07-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-07-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	7400		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-07-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	7500		ug/L	1000.0	03/11/2022	AB22-0308-09

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-0146-08
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-0146-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	118		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	86		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	959		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	74700		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	4830		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	33		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	27500		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	147		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	17		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	4		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	6350		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	2		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	56900		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-08-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-08-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/02/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/02/2022	AB22-0301-08

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

Aliquot #: 22-0146-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	57200		ug/L	1000.0	03/02/2022	AB22-0304-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-0146-08
Matrix: Groundwater

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-0146-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/02/2022	AB22-0304-03
Sulfate	148000		ug/L	1000.0	03/02/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-08-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	800		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0146-08-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	529		mg/L	10.0	03/03/2022	AB22-0303-10

Alkalinity by SM 2320B

Aliquot #: 22-0146-08-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	191000		ug/L	10000.0	03/04/2022	AB22-0304-09
Alkalinity Bicarbonate	191000		ug/L	10000.0	03/04/2022	AB22-0304-09
Alkalinity Carbonate	ND		ug/L	10000.0	03/04/2022	AB22-0304-09

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-08-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/04/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-08-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2400		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-08-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	2500		ug/L	1000.0	03/11/2022	AB22-0308-09

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-0146-09
Matrix: Water

Laboratory Project: **22-0146**
Collect Date: 03/01/2022
Collect Time: 09:15 AM

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

Aliquot #: 22-0146-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	ND		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	ND		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	ND		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	ND		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	ND		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	ND		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	ND		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-09-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-09-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/03/2022	AB22-0303-01
Nitrite	ND		ug/L	100.0	03/03/2022	AB22-0303-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-09-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	03/08/2022	AB22-0308-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-0146-09
Matrix: Water

Laboratory Project: **22-0146**
Collect Date: 03/01/2022
Collect Time: 09:15 AM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-09-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/07/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-09-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-09-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	1800		ug/L	1000.0	03/11/2022	AB22-0308-09

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-0146-10
Matrix: Water

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0146-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	ND		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	ND		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	ND		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	ND		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	ND		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	ND		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	ND		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0146-10-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0146-10-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/02/2022	AB22-0301-08
Nitrite	ND		ug/L	100.0	03/02/2022	AB22-0301-08

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0146-10-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	03/08/2022	AB22-0308-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-0146-10
Matrix: Water

Laboratory Project: **22-0146**
Collect Date: 02/28/2022
Collect Time: 01:44 PM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0146-10-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/07/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-10-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	03/11/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0146-10-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	03/11/2022	AB22-0308-09

Data Qualifiers	Exception Summary
	No exceptions occured.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0146

Inspection Date: 3.1.22 **Inspection By:** dmw

Sample Origin/Project Name: Q1-2022 DEK Lined Impoundment

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 270329748117 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 1.2 - 2.4°C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015402 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)	14 → 16				
Quart/Liter (g/p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	32				
24 mL vial (glass)					
500 mL (plastic)					
Other 250 ml plastic	7				

pH paper
Fisher Sci
Cat NO 13-640-508
dmw 3.1.22
0.0 - 14.0
lot: 222420
EXP: 8.1.23

Page 2 of 2 not needed

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0146

Inspection Date: 3.2.22 **Inspection By:** LMO

Sample Origin/Project Name: _____

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx X UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 270369660455 3 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 3.0 Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 015402 6.08.22

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	40mL(4)				
~~Quart/Liter (g/p)~~	60mL(2)				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	~~24~~ 8				
24 mL vial (glass)					
250mL ~~500~~ mL (plastic)	1				
Other					

Page 2 of 2 not needed

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SAMPLING SITE / CUSTOMER: Q1-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0146

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon
22-0146-01	2/28/22	1504	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x
-02	2/28/22	1344	GW	OW-10	9	4	1	1	1	2			x	x	x	x	x	x	x	x
~~-03~~	~~—~~	~~—~~	~~GW~~	~~OW-11~~	~~9~~	~~4~~	~~1~~	~~1~~	~~1~~	~~2~~			~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
-04	2/28/22	1214	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x
-05	2/28/22	1020	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x
-06	2/28/22	1000	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x
-07	2/28/22	0931	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x
-08	2/28/22	—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x
~~-09~~	~~—~~	~~—~~	~~W~~	~~EB-KLI~~	~~6~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~			~~x~~	~~x~~	~~x~~			~~x~~	~~x~~	~~x~~
-10	2/28/22	1344	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x

REMARKS

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
[signature]	2/28/22 / 1630	FedEx
Fed Ex	03-01-2022 / 430	[signature]

COMMENTS:

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

Temperature: 1.2-2.4 °C — Cal. Due Date: 6-5-22

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Page _____ of _____

SAMPLING SITE / CUSTOMER: Q1-2022 DEK Lined Impoundment

PROJECT NUMBER: **22-0146**

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
~~22-0146-01~~			GW	~~DEK-MW-15003~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-02~~			GW	~~OW-10~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	3/1/22	0854	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-04~~			GW	~~OW-12~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-05~~			W	~~KLI-SCS~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-06~~			SW	~~KLI-PCS~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-07~~			SW	~~SW-DITCH~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-08~~			GW	~~DUP-KLI~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-09	3/1/22	0915	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	
~~-10~~			W	~~FB-KLI~~	6	1	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY: [signature] — DATE/TIME: 3/1/22 1345 — RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex — DATE/TIME: 03-02-22 1130 — RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 3.0 °C — Cal. Due Date: 6-3-22

Analytical Laboratory Report

Report ID: S33515.01(01)
Generated on 03/07/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S33515.01-S33515.10
Project: 22-0146 PR#22030253
Collected Date(s): 02/28/2022 - 03/01/2022
Submitted Date/Time: 03/04/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33515.01	DEK-15003 22-0146-01	Groundwater	02/28/22 15:04
S33515.02	OW-10 22-0146-02	Groundwater	02/28/22 13:44
S33515.03	OW-11 22-0146-03	Groundwater	03/01/22 08:54
S33515.04	OW-12 22-0146-04	Groundwater	02/28/22 12:14
S33515.05	KLI-SCS 22-0146-05	Groundwater	02/28/22 10:20
S33515.06	KLI-PCS 22-0146-06	Groundwater	02/28/22 10:00
S33515.07	SW-DITCH 22-0146-07	Groundwater	02/28/22 09:31
S33515.08	DUP 22-0146-08	Groundwater	02/28/22 00:01
S33515.09	EB-KLI 22-0146-09	Groundwater	03/01/22 09:15
S33515.10	FB-KLI 22-0146-10	Groundwater	02/28/22 13:44

Analytical Laboratory Report

Lab Sample ID: S33515.01
Sample Tag: DEK-15003 22-0146-01
Collected Date/Time: 02/28/2022 15:04
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.22	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.02
Sample Tag: OW-10 22-0146-02
Collected Date/Time: 02/28/2022 13:44
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.06	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.03
Sample Tag: OW-11 22-0146-03
Collected Date/Time: 03/01/2022 08:54
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/07/22 10:31, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.04
Sample Tag: OW-12 22-0146-04
Collected Date/Time: 02/28/2022 12:14
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:44, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.05
Sample Tag: KLI-SCS 22-0146-05
Collected Date/Time: 02/28/2022 10:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:46, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.06
Sample Tag: KLI-PCS 22-0146-06
Collected Date/Time: 02/28/2022 10:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:48, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.07
Sample Tag: SW-DITCH 22-0146-07
Collected Date/Time: 02/28/2022 09:31
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:50, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.08
Sample Tag: DUP 22-0146-08
Collected Date/Time: 02/28/2022 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/04/22 13:52, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.09
Sample Tag: EB-KLI 22-0146-09
Collected Date/Time: 03/01/2022 09:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/07/22 10:33, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33515.10
Sample Tag: FB-KLI 22-0146-10
Collected Date/Time: 02/28/2022 13:44
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/07/22 10:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID: S33515
Client: CONSUMERS (Consumers Energy)
Project: 22-0146 PR#22030253
Submitted: 03/04/2022 08:15 Login User: PFD

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.6
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S33515 Submitted: 03/04/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0146 PR#22030253

Initial Preservation Check: 03/04/2022 08:57 PFD

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33515.01	125ml Plastic NaOH	>12			
S33515.02	125ml Plastic NaOH	>12			
S33515.03	125ml Plastic NaOH	>12			
S33515.04	125ml Plastic NaOH	>12			
S33515.05	125ml Plastic NaOH	>12			
S33515.06	125ml Plastic NaOH	>12			
S33515.07	125ml Plastic NaOH	>12			
S33515.08	125ml Plastic NaOH	>12			
S33515.09	125ml Plastic NaOH	>12			
S33515.10	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson STATE: MI ZIP CODE: 49201
PHONE NO.: 517-788-5888 FAX NO.: 517-788-2533 P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 22-0146 PR#22030253
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
33515.01	2-28-22	1504	BEK-15003 22-0146-01	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	↓	1344	OW-10 -02	GW	1					1			✓	"
.03	3-1-22	0854	OW-11 -03	GW	1					1			✓	"
.04	2-28-22	1214	OW-12 -04	GW	1					1			✓	"
.05		1020	KL1-SCS -05	GW	1					1			✓	"
.06		1000	KL1-PCS -06	GW	1					1			✓	"
.07		0931	SW-DITCH -07	GW	1					1			✓	"
.08	↓	—	DUP-KL1 -08	GW	1					1			✓	"
.09	3-1-22	0915	EB-KL1 -09	GW	1					1			✓	"
.10	2-28-22	1344	FB-KL1 -10	GW	1					1			✓	"

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
CONSUMERS ENERGY		03-03-22	2150
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Merit Drop Box	3/4/22	0815
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME
Patty Wilson	3/4/22	0815

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 3.6

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

March 14, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q1-2022 DEK Lined Impoundment
22-0146

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 03/08/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 80490 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05768**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-01 DEK-MW-15003**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**5200**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**3800**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05769**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-02 OW-10**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**6800**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**6300**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 03/01/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05770**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-03 OW-11**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**6900**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**6400**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05771**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-04 OW-12**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**2900**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**2400**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05772**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-05 KLI-SCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**6000**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**5600**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05773**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-06 KLI-PCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**6000**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**4500**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05774**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-07 SW-DITCH**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**7500**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**7400**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
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Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05775**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-08 DUP-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**2500**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**2400**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
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Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 03/01/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05776**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-09 EB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**1800**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

Brighton Analytical LLC
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Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 02/28/2022
Submit Date: 03/08/2022
Report Date: 03/14/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80490**
BA Sample ID: **CQ05777**
Project Name: **Q1-2022 DEK Lined Impoundment**
Project Number: **22-0146**
Sample ID: **22-0146-10 FB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RM	03/11/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RM	03/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/14/2022

CHAIN OF CUSTODY

8049.

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Page _____ of _____

SAMPLING SITE / CUSTOMER: Q1-2022 DEK Lined Impoundment

PROJECT NUMBER: **22-0146**

SAP CC or WO#:

REQUESTER: Emil Blaj

SAMPLING TEAM:

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

SEND REPORT TO: Emil Blaj | email: Emil.Blaj@cmsenergy.com | phone:

COPY TO:

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 Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0146-01	02-28-2022	1504	GW	DEK-MW-15003	2					2			x	x	QS 5768
-02	02-28-2022	1344	GW	OW-10	2					2			x	x	69
-03	03-01-2022	0854	GW	OW-11	2					2			x	x	70
-04	02-28-2022	1214	GW	OW-12	2					2			x	x	71
-05	02-28-2022	1020	W	KLI-SCS	2					2			x	x	72
-06	02-28-2022	1000	SW	KLI-PCS	2					2			x	x	73
-07	02-28-2022	0931	SW	SW-DITCH	2					2			x	x	74
-08	02-28-2022	-	GW	DUP-KLI	2					2			x	x	75
-09	03-01-2022	0915	W	EB-KLI	2					2			x	x	76
-10	02-28-2022	1344	W	FB-KLI	2					2			x	x	77

RELINQUISHED BY: Jelena Okopa | DATE/TIME: 3.08.22 1608 | RECEIVED BY:

RELINQUISHED BY: | DATE/TIME: | RECEIVED BY:

COMMENTS: PR # 22030264

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

Temperature: _____ °C Cal. Due Date: _____

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 3/11/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CQ05771	TV=10000	2400	100/102	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CQ05771	12400	12600	1.60	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	102		
Method Standard (Lab. Control Spike):		#3046.6	111		

COMMENTS:

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 3/11/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CQ05781	TV=10000	3200	104/104	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CQ05781	13600	13600	0.00	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	102		
Method Standard (Lab. Control Spike):		#3046.6	111		

COMMENTS:

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: March 19, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2022 Q1

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0145R

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area on 03/01/2022, for the 1st Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 03/02/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

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

II. Methodology

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

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2022 DEK Bottom Ash Pond & Lined Impoundment
Date Received: 3/2/2022
Chemistry Project: 22-0145

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0145-01	DEK-MW-18001	Groundwater	03/01/2022 08:35 AM	DEK Bottom Ash Pond & Lined Impoundment
22-0145-02	DEK-MW-18001 MS	Groundwater	03/01/2022 08:35 AM	DEK Bottom Ash Pond & Lined Impoundment
22-0145-03	DEK-MW-18001 MSD	Groundwater	03/01/2022 08:35 AM	DEK Bottom Ash Pond & Lined Impoundment

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-0145-01
Matrix: Groundwater

Laboratory Project: **22-0145**
Collect Date: 03/01/2022
Collect Time: 08:35 AM

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

Aliquot #: 22-0145-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Arsenic	130		ug/L	1.0	03/13/2022	AB22-0311-05
Barium	194		ug/L	5.0	03/13/2022	AB22-0311-05
Beryllium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Boron	898		ug/L	20.0	03/11/2022	AB22-0311-05
Cadmium	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Calcium	70100		ug/L	1000.0	03/11/2022	AB22-0311-05
Chromium	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Cobalt	ND		ug/L	6.0	03/13/2022	AB22-0311-05
Copper	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Iron	1490		ug/L	20.0	03/13/2022	AB22-0311-05
Lead	ND		ug/L	1.0	03/13/2022	AB22-0311-05
Lithium	21		ug/L	10.0	03/13/2022	AB22-0311-05
Magnesium	13700		ug/L	1000.0	03/11/2022	AB22-0311-05
Manganese	241		ug/L	5.0	03/13/2022	AB22-0311-05
Molybdenum	ND		ug/L	5.0	03/13/2022	AB22-0311-05
Nickel	4		ug/L	2.0	03/13/2022	AB22-0311-05
Potassium	4880		ug/L	100.0	03/11/2022	AB22-0311-05
Selenium	2		ug/L	1.0	03/13/2022	AB22-0311-05
Silver	ND		ug/L	0.2	03/13/2022	AB22-0311-05
Sodium	102000		ug/L	1000.0	03/11/2022	AB22-0311-05
Thallium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Vanadium	ND		ug/L	2.0	03/13/2022	AB22-0311-05
Zinc	ND		ug/L	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0145-01-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0145-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/03/2022	AB22-0303-01
Nitrite	ND		ug/L	100.0	03/03/2022	AB22-0303-01

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

Aliquot #: 22-0145-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	65600		ug/L	1000.0	03/04/2022	AB22-0304-03

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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-0145-01
Matrix: Groundwater

Laboratory Project: **22-0145**
Collect Date: 03/01/2022
Collect Time: 08:35 AM

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

Aliquot #: 22-0145-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/03/2022	AB22-0304-03
Sulfate	193000		ug/L	1000.0	03/04/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0145-01-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2200		ug/L	25.0	03/08/2022	AB22-0308-03

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0145-01-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	589		mg/L	10.0	03/03/2022	AB22-0303-09

Alkalinity by SM 2320B

Aliquot #: 22-0145-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	158000		ug/L	10000.0	03/14/2022	AB22-0314-12
Alkalinity Bicarbonate	158000		ug/L	10000.0	03/14/2022	AB22-0314-12
Alkalinity Carbonate	ND		ug/L	10000.0	03/14/2022	AB22-0314-12

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0145-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	50		ug/L	20.0	03/07/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0145-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4500		ug/L	1000.0	03/14/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0145-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4100		ug/L	1000.0	03/14/2022	AB22-0308-09

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-0145-02
Matrix: Groundwater

Laboratory Project: **22-0145**
Collect Date: 03/01/2022
Collect Time: 08:35 AM

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

Aliquot #: 22-0145-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	118		%	1.0	03/13/2022	AB22-0311-05
Arsenic	99		%	1.0	03/13/2022	AB22-0311-05
Barium	114		%	5.0	03/13/2022	AB22-0311-05
Beryllium	95		%	1.0	03/13/2022	AB22-0311-05
Boron	97		%	20.0	03/11/2022	AB22-0311-05
Cadmium	113		%	0.2	03/13/2022	AB22-0311-05
Calcium	92.3		%	1000.0	03/11/2022	AB22-0311-05
Chromium	112		%	1.0	03/13/2022	AB22-0311-05
Cobalt	113		%	6.0	03/13/2022	AB22-0311-05
Copper	102		%	1.0	03/13/2022	AB22-0311-05
Iron	98		%	20.0	03/13/2022	AB22-0311-05
Lead	107		%	1.0	03/13/2022	AB22-0311-05
Lithium	94		%	10.0	03/13/2022	AB22-0311-05
Magnesium	99.8		%	1000.0	03/11/2022	AB22-0311-05
Manganese	118		%	5.0	03/13/2022	AB22-0311-05
Molybdenum	118		%	5.0	03/13/2022	AB22-0311-05
Nickel	110		%	2.0	03/13/2022	AB22-0311-05
Potassium	101		%	100.0	03/11/2022	AB22-0311-05
Selenium	118		%	1.0	03/13/2022	AB22-0311-05
Silver	105		%	0.2	03/13/2022	AB22-0311-05
Sodium	99.7		%	1000.0	03/11/2022	AB22-0311-05
Thallium	109		%	2.0	03/13/2022	AB22-0311-05
Vanadium	122		%	2.0	03/13/2022	AB22-0311-05
Zinc	113		%	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0145-02-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	90.8		%	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0145-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	98		%	100.0	03/03/2022	AB22-0303-01
Nitrite	100		%	100.0	03/03/2022	AB22-0303-01

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

Aliquot #: 22-0145-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	107		%	1000.0	03/04/2022	AB22-0304-03

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-0145-02
Matrix: Groundwater

Laboratory Project: **22-0145**
Collect Date: 03/01/2022
Collect Time: 08:35 AM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous — **Aliquot #: 22-0145-02-C02-A02** — **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	92		%	1000.0	03/03/2022	AB22-0304-03
Sulfate	109		%	1000.0	03/04/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL — **Aliquot #: 22-0145-02-C03-A01** — **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	101		%	25.0	03/08/2022	AB22-0308-03

Alkalinity by SM 2320B — **Aliquot #: 22-0145-02-C05-A01** — **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	95.8		%	10000.0	03/14/2022	AB22-0314-12

Sulfide, Total by SM 4500 S2D — **Aliquot #: 22-0145-02-C07-A01** — **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	20.0	03/07/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous — **Aliquot #: 22-0145-02-C08-A01** — **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	99		%	1000.0	03/14/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous — **Aliquot #: 22-0145-02-C09-A01** — **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	106		%	1000.0	03/14/2022	AB22-0308-09

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-0145-03
Matrix: Groundwater

Laboratory Project: **22-0145**
Collect Date: 03/01/2022
Collect Time: 08:35 AM

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

Aliquot #: 22-0145-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	121		%	1.0	03/13/2022	AB22-0311-05
Arsenic	107		%	1.0	03/13/2022	AB22-0311-05
Barium	118		%	5.0	03/13/2022	AB22-0311-05
Beryllium	96		%	1.0	03/13/2022	AB22-0311-05
Boron	99		%	20.0	03/11/2022	AB22-0311-05
Cadmium	116		%	0.2	03/13/2022	AB22-0311-05
Calcium	104		%	1000.0	03/11/2022	AB22-0311-05
Chromium	114		%	1.0	03/13/2022	AB22-0311-05
Cobalt	113		%	6.0	03/13/2022	AB22-0311-05
Copper	104		%	1.0	03/13/2022	AB22-0311-05
Iron	95		%	20.0	03/13/2022	AB22-0311-05
Lead	111		%	1.0	03/13/2022	AB22-0311-05
Lithium	97		%	10.0	03/13/2022	AB22-0311-05
Magnesium	109		%	1000.0	03/11/2022	AB22-0311-05
Manganese	127		%	5.0	03/13/2022	AB22-0311-05
Molybdenum	125		%	5.0	03/13/2022	AB22-0311-05
Nickel	111		%	2.0	03/13/2022	AB22-0311-05
Potassium	111		%	100.0	03/11/2022	AB22-0311-05
Selenium	122		%	1.0	03/13/2022	AB22-0311-05
Silver	106		%	0.2	03/13/2022	AB22-0311-05
Sodium	110		%	1000.0	03/11/2022	AB22-0311-05
Thallium	113		%	2.0	03/13/2022	AB22-0311-05
Vanadium	124		%	2.0	03/13/2022	AB22-0311-05
Zinc	108		%	10.0	03/13/2022	AB22-0311-05

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0145-03-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	88.0		%	0.2	03/14/2022	AB22-0314-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0145-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	103		%	100.0	03/03/2022	AB22-0303-01
Nitrite	104		%	100.0	03/03/2022	AB22-0303-01

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

Aliquot #: 22-0145-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	106		%	1000.0	03/04/2022	AB22-0304-03

Consumers Energy
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Laboratory Services
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Analytical Report

Report Date: 03/19/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-0145-03
Matrix: Groundwater

Laboratory Project: **22-0145**
Collect Date: 03/01/2022
Collect Time: 08:35 AM

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

Aliquot #: 22-0145-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	93		%	1000.0	03/03/2022	AB22-0304-03
Sulfate	113		%	1000.0	03/04/2022	AB22-0304-03

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0145-03-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	108		%	25.0	03/08/2022	AB22-0308-03

Alkalinity by SM 2320B

Aliquot #: 22-0145-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	95.3		%	10000.0	03/14/2022	AB22-0314-12

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0145-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	91		%	20.0	03/07/2022	AB22-0306-01

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0145-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	101		%	1000.0	03/14/2022	AB22-0308-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0145-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	103		%	1000.0	03/14/2022	AB22-0308-09

Data Qualifiers	Exception Summary
	No exceptions occured.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0145

Inspection Date: 03.02.45 **Inspection By:** LMO / CET

Sample Origin/Project Name: _____

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 2703 6960 4531 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 3.2 Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration G15402 6.03.22

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	40mL (6)				
Quart/Liter (g/p)	60mL (6)				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	12				
24 mL vial (glass)					
~~500~~ 250 mL (plastic)	3				
Other					

Page 2 of 2 not needed

CHAIN OF CUSTODY

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q1-2022 DEK Bottom Ash Pond & Lined Impound.	PROJECT NUMBER: 22-0145	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER	REQUESTER: Harold Register	
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register / TRC	MATRIX CODES: GW = Groundwater, WW = Wastewater, W = Water / Aqueous Liquid, S = Soil / General Solid, O = Oil, OX = Other, SL = Sludge, A = Air, WP = Wipe, WT = General Waste		

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon		REMARKS
22-0145-01	3/1/22	835	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-02	3/1/22	835	GW	DEK-MW-18001 MS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-03	3/1/22	835	GW	DEK-MW-18001 MSD	9	4	1	1	1	2			x	x	x	x	x	x	x	x		

RELINQUISHED BY:	DATE/TIME: 3/1/22 1345	RECEIVED BY: Fedex
RELINQUISHED BY: Fed Ex	DATE/TIME: 03-02-22 1130	RECEIVED BY:

COMMENTS:

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

Temperature: 3.2 °C Cal. Due Date: 6-3-22

Analytical Laboratory Report

Report ID: S33514.01(01)
Generated on 03/07/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S33514.01-S33514.03
Project: 22-0145 PR#22030253
Collected Date(s): 03/01/2022
Submitted Date/Time: 03/04/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33514.01	DEK-MW-18001 22-0145-01	Groundwater	03/01/22 08:35
S33514.02	DEK-MW-18001 MSpike-02	Groundwater	03/01/22 08:35
S33514.03	DEK-MW-18001 MSpike-03	Groundwater	03/01/22 08:35

Analytical Laboratory Report

Lab Sample ID: S33514.01
Sample Tag: DEK-MW-18001 22-0145-01
Collected Date/Time: 03/01/2022 08:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/07/22 10:25, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.05	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S33514.02
Sample Tag: DEK-MW-18001 MSpike-02
Collected Date/Time: 03/01/2022 08:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/07/22 10:27, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.233	0.02	0.005	mg/L	1	18496-25-8	1

1-* Sample spiked @ 0.20 mg/L

Analytical Laboratory Report

Lab Sample ID: S33514.03
Sample Tag: DEK-MW-18001 MSpike-03
Collected Date/Time: 03/01/2022 08:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.6	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/07/22 10:29, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.232	0.02	0.005	mg/L	1	18496-25-8	1

1-* Sample spiked @ 0.20 mg/L 030722 030722 * Sample spiked @ 0.20 mg/L 030722 030722

Merit Laboratories Login Checklist

Lab Set ID: S33514
Client: CONSUMERS (Consumers Energy)
Project: 22-0145 PR#22030253
Submitted: 03/04/2022 08:15 Login User: PFD

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.6
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S33514 Submitted: 03/04/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0145 PR#22030253

Initial Preservation Check: 03/04/2022 08:54 PFD

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33514.01	125ml Plastic NaOH	>12			
S33514.02	125ml Plastic NaOH	>12			
S33514.03	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 22-0145 PR#22030253
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
335/401	3-1-22	0835	DEK-MW-18001 22-0145-01	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	↓	↓	DEK-MW-18001 MSpike -02	GW	1					1			✓	"
.03	↓	↓	DEK-MW-18001 MSpike Dup -03	GW	1					1			✓	"
														Please report spike concentration & recovery
														Thank You!

RELINQUISHED BY: SIGNATURE/ORGANIZATION	CONSUMERS ENERGY ☐ Sampler	DATE 03-03-22	TIME 2150	RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 3/4/22	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 3/4/22	TIME 0815
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	NOTES: TEMP. ON ARRIVAL 3.6
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

March 15, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q1-2022 DEK Bottom Ash Pond & Lined Impound
22-0145

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 03/08/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 80492 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 03/01/2022
Submit Date: 03/08/2022
Report Date: 03/15/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80492**
BA Sample ID: **CQ05785**
Project Name: **Q1-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-0145**
Sample ID: **22-0145-01 DEK-MW-18001**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4100**	ug/L	1000	SM5310B	RG	03/14/2022
Total Organic Carbon	**4500**	ug/L	1000	SM5310B	RG	03/14/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/15/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 03/01/2022
Submit Date: 03/08/2022
Report Date: 03/15/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80492**
BA Sample ID: **CQ05786**
Project Name: **Q1-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-0145**
Sample ID: **22-0145-02 DEK-MW-18001 MS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**106%**	ug/L		SM5310B	RG	03/14/2022
Total Organic Carbon	**99%**	ug/L		SM5310B	RG	03/14/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/15/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 03/01/2022
Submit Date: 03/08/2022
Report Date: 03/15/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **80492**
BA Sample ID: **CQ05787**
Project Name: **Q1-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-0145**
Sample ID: **22-0145-03 DEK-MW-18001 MSD**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**103%**	ug/L		SM5310B	RG	03/14/2022
Total Organic Carbon	**101%**	ug/L		SM5310B	RG	03/14/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 3/15/2022

CHAIN OF CUSTODY

80492

Consumers Energy — Count on Us®

CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

Page ____ of ____

SAMPLING SITE / CUSTOMER: Q1-2022 DEK Bottom Ash Pond & Lined Impound.	PROJECT NUMBER: 22-0145	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER ____	REQUESTER: Emil Blaj	
SEND REPORT TO: Emil Blaj	email:	phone:	
COPY TO:			

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

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	ANALYSIS REQUESTED: Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0145-01	3-01-2022	0835	GW	DEK-MW-18001	2					2			x	x	5785
-02	3-01-2022	0835	GW	DEK-MW-18001 MS	2					2			x	x	86
-03	3-01-2022	0835	GW	DEK-MW-18001 MSD	2					2			x	x	87

22-0145R Page 29 of 33

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

C00

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
Leeana Okpara	3.08.22 1608	
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS: PR# 22030264

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

Temperature: ____ °C Cal. Due Date: ____

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 3/14/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CQ05789	TV=10000	4800	104/108	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CQ05789	15200	15600	2.60	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	102		
Method Standard (Lab. Control Spike):		#3046.6	103		

COMMENTS: _____

Appendix B
Field Notes

TRC

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance
PROJECT NUMBER:	464095.0001.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	2/28/22 TO 3/1/2022
PURPOSE OF FIELDWORK:	First Quarter Supplemental Sampling event
WORK PERFORMED BY:	Andrew Whaley, Jake Krenz, Javier Jasso

SIGNED 3/3/22 DATE

CHECKED BY 3/3/22 DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Comp	DATE: 2/28/22	TIME ARRIVED: 0730
PROJECT NUMBER: 464095.0001.0000	AUTHOR: Andrew Whaley, Jake Krer	TIME LEFT: 1600

WEATHER

TEMPERATURE: 20 °F WIND: 5-10 MPH VISIBILITY: clear

WORK / SAMPLING PERFORMED

Collected Samples: SW-Ditch, KLI-PCS, KLI-SCS, OW-12, OW-10, ~~DEK-MW-15003~~ (SK) DEK-MW-15003

Javier collected water levels

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
NA	NA

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
C. Batts	CEC	check in/out

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
purge water	NM	purged to ground

SIGNED 3/3/22 DATE

AW 3/3/22 CHECKED BY DATE

REVISED 04/2019

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Comp	DATE: 3/1/2022	TIME ARRIVED: 0730
PROJECT NUMBER:	464095.0001.0000	AUTHOR: Andrew Whaley, Jake Krer	TIME LEFT: 1330

WEATHER

TEMPERATURE: 24 °F WIND: 0-10 MPH VISIBILITY: clear / cloudy

WORK / SAMPLING PERFORMED

Collected Samples: OW-11, ~~MW~~ DEK-MW-15005, DEK-MW-15006 ~~DEK-MW-15007~~ (SK)

Staked Boring locations for week of 3/7/22

Shipped Samples to lab

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
NA	NA

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
D Litz	TRC	site updates

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
purge water	NM	purged to ground

[signature] 3/3/2022
SIGNED DATE

AGW 5/8/22
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Comp	DATE: 3/1/22	TIME ARRIVED: 730
PROJECT NUMBER:	464095.0001.0000	AUTHOR: Andrew Whaley, Jake Krer	TIME LEFT: 1330

464095.0000

WEATHER		
TEMPERATURE: 24° °F	WIND: 0-10 MPH	VISIBILITY: Clear

WORK / SAMPLING PERFORMED

Sampled wells; MW-18001, DEK-MW-15002, OW-02, MW-22

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
None	—

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Jake Krer	TRC	Tech. Coordinator
Caleb Batts	Consumers	EHS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Ground	—	

Andrew Whaley 3/2/22
SIGNED DATE

Jake Krer 3/3/22
CHECKED BY DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW	SAMPLER NAME:	Andrew Whaley, Jake Krenz, Javier Jass
PROJECT NO.:	464095.0001.0000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
HERON DIPPER-T	TRC A2

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
NA	NA

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)
HERON DIPPER-T	TRC A2

PURGING METHOD

NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
PERISTALTIC PUMP	TRC A2

SAMPLING METHOD

NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
PERISTALTIC PUMP	TRC A2
GEOTECH DISPOSABLE FILTER	0.45 MICRON
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

POTABLE WATER SOURCE	DI WATER SOURCE
STORE BOUGHT	LABORATORY PROVIDED
SIGNED: [signature] DATE: 3/3/22	CHECKED BY: AWS DATE: 3/3/22

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	MODEL:	YSI PRO DSS	SAMPLER:	AW, JK, JJ
PROJECT NO.:	464095.0001.0000	SERIAL #:	Ann Arbor	DATE:	2/28/22

PH CALIBRATION CHECK

pH 7 (LOT #): 1GI081 (EXP. DATE): Sep/23 — POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 1GH1124 (EXP. DATE): Aug/23 — POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.14 / 7.14	4.01 / 4.01	☒ WITHIN RANGE	0910
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 1GI464 (EXP. DATE): Sep/22 — POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
854 / 854	2.5	☒ WITHIN RANGE	0902
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 205 1004199 (EXP. DATE): 8/28/22 — POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
190.2 / 190.2	2.7	☒ WITHIN RANGE	0918
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING — POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
16.24 / 16.24	2.9	☒ WITHIN RANGE	0922
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): 18293474 (EXP. DATE): 4/22 — POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): — POST-CAL. READING / STANDARD	CAL. RANGE	TIME
11.0 / 10.0	/	☒ WITHIN RANGE	0924
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):

☑ STANDARD SOLUTION (S) — LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK

CALIBRATED PARAMETERS		CALIBRATION RANGES (1)	
☐	pH	pH:	+/- 0.2 S.U.
☐	COND	COND:	+/- 1% OF CAL. STANDARD
☐	ORP	ORP:	+/- 25 mV
☐	D.O.	D.O.:	VARIES
☐	TURB	TURB:	+/- 5% OF CAL. STANDARD
☐	_____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER	
☐	_____		

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS
NA	NA

SIGNED _____ DATE 3/3/22

CHECKED BY AW DATE 3/3/22

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	MODEL: YSI Pro DSS	SAMPLER: AW (JK) JJ
PROJECT NO.:	464095.0001.0000	SERIAL #: Ann Arbor	DATE: 3/1/22

PH CALIBRATION CHECK

pH 7 (LOT #): 16I081 (EXP. DATE): Sep/23 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 16H1124 (EXP. DATE): Aug/23 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.03 / 7.03	4.00 / 4.00	☒ WITHIN RANGE	0637
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 16E464 (EXP. DATE): Sep/22 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1344 / 1341	18.3	☒ WITHIN RANGE	0630
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 2051004499 (EXP. DATE): 8/28/22 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
254 / 254	19.0	☒ WITHIN RANGE	0643
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
9.61 / 9.61	18.0	☒ WITHIN RANGE	0647
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): 18293474 (EXP. DATE): 4/22 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
10.2 / 10.0	/	☒ WITHIN RANGE	0645
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS
NA	NA

SIGNED: _____ 3/3/22 DATE

CHECKED BY: AW 3/3/22 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	MODEL: YSI Pro ~~Plus~~ DSS	SAMPLER: (AW) JK, JJ
PROJECT NO.:	464095.0001.0000	SERIAL #: Rental	DATE: 3/1/22

PH CALIBRATION CHECK

pH 7 (LOT #): 1G 240495 (EXP. DATE): Nov/23 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 1G57806 (EXP. DATE): Oct/23 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.00 / 7.00	4.01 / 4.01	☒ WITHIN RANGE	630
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

~~SPECIFIC~~ CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 1G57701 (EXP. DATE): Oct/22 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1246 / 1246	18.0	☑ WITHIN RANGE	635
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 2 KG100575 (EXP. DATE): 7/29/26 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
238.3 / 238.3	17.8	☑ WITHIN RANGE	640
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
13.1 / 13.1	4.2	☑ WITHIN RANGE	650
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A1496 (EXP. DATE): Jul/23 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
100.1 / 100.1	/	☑ WITHIN RANGE	645
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

Caroline Whaley 3/2/22
SIGNED DATE

Jack Kay 3/3/22
CHECKED BY DATE

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	DATE:	2/28/22
PROJECT NUMBER:	464095.0001.0000	AUTHOR:	Andrew Whaley, Jake Krenz,

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
DE Karn Bottom Ash Pond						
DEK-MW-15002	1131		6.91	15.75	NA	NA
DEK-MW-15004	1149		28.41	41.80	↓	↓
DEK-MW-15005	1126		10.0	23.22		
DEK-MW-15006	1129		9.53	21.50		
DE Karn Bottom Ash Pond and Lined Impoundment						
DEK-MW-18001	1135		8.53	19.65	NA	NA
DEK-MW-15003	1143		16.96	27.87	NA	NA
Karn Lined Impoundment						
OW-10	1521		6.95	17.95	NA	NA
OW-11	1140		22.21	25.47	↓	↓
OW-12	1527		17.27	23.41	↓	↓
Background						
MW-15002	1036		6.80	16.80	NA	NA
MW-15008	1020		4.53	17.46	↓	↓
MW-15016	NA		NM	NM	↓	↓
MW-15019	1032		5.75	16.85	↓	↓

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR
(E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/3/22 DATE

CHECKED 3/3/22 DATE

REVISED 04/2019

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: SW-Ditch | WELL DIAMETER: ~~☑ 2"~~ ☐ 4" ☐ 6" ☒ OTHER N/A

WELL MATERIAL: ~~☑ PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER N/A

SAMPLE TYPE: ~~☑ GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: NA	DATE: NA
PURGE METHOD:	~~☑ PUMP~~ ~~PERISTALTIC PUMP~~ ~~☐ BAILER~~	
DEPTH TO WATER: NA T/ PVC		
DEPTH TO BOTTOM: NA T/ PVC		
WELL VOLUME: NA	☐ LITERS	☐ GALLONS
VOLUME REMOVED: NA	☐ LITERS	☐ GALLONS
COLOR: light Brown	ODOR: none	
TURBIDITY: ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY		
DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER		

SAMPLE	TIME: 0931	DATE: 2/28/22
PH: 7.97 SU	CONDUCTIVITY: 358.2 umhos/cm	
ORP: 150.0 mV	DO: 12.21 mg/L	
TURBIDITY: 29.7 NTU		
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 10.5 °C	OTHER: ~~—~~	
COLOR: light Brown	ODOR: none	
FILTRATE (0.45 um) ☒ YES ☐ NO		
FILTRATE COLOR: clear	FILTRATE ODOR: none	
QC SAMPLE: ☐ MS/MSD ☐ DUP-		
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0931	NA	7.97	358.2	150.0	12.21	29.7	10.5	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	~~125 mL~~ ~~250mL~~	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	~~2~~				☐ Y ☐ N
1			C	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1	↓		F	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	2/28/22	AIRBILL NUMBER:	~~—~~
COC NUMBER:	~~—~~	SIGNATURE:		DATE SIGNED:	3/3/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: KLI-PLS | WELL DIAMETER: ~~☑ 2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~☑ PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~☑ GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1000	DATE: 2/28/22	SAMPLE	TIME: 1000	DATE: 2/28/22
PURGE METHOD:	~~☑ PUMP~~ ~~PERISTALTIC PUMP~~ ~~☐ BAILER~~		PH: 8.54 SU	CONDUCTIVITY: 344.7 umhos/cm	
			ORP: 136.0 mV	DO: 12.64 mg/L	
DEPTH TO WATER: NA T/ PVC			TURBIDITY: 22.6 NTU		
DEPTH TO BOTTOM: NA T/ PVC			☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 5.0 °C	OTHER:	
VOLUME REMOVED: NA ☐ LITERS ☐ GALLONS			COLOR: light gray	ODOR: none	
COLOR: ~~clear~~ light gray ODOR: none			FILTRATE (0.45 um) ☒ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR: none	
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1000	NA	8.54	344.7	136.0	12.64	22.6	5.0	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1			F	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	2/28/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	3/3/22

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER: 464095.0001.0000	BY: AW, JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: KLI - SCS | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER N/A

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER N/A

SAMPLE TYPE: ~~GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: ~~TIME:~~	DATE: ~~DATE:~~
PURGE METHOD:	~~PUMP~~ ~~PERISTALTIC PUMP~~ / ~~BAILER~~	
DEPTH TO WATER: N/A T/ PVC		
DEPTH TO BOTTOM: N/A T/ PVC		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS		
VOLUME REMOVED: N/A ☐ LITERS ☐ GALLONS		
COLOR: Clear	ODOR: none	
TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER		

SAMPLE	TIME: 1020	DATE: 2/28/22
PH: 7.54 SU	CONDUCTIVITY: 1216 umhos/cm	
ORP: 54.3 mV	DO: 6.62 mg/L	
TURBIDITY: 3.61 NTU		
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 6.8 °C	OTHER:	
COLOR: Clear	ODOR: none	
FILTRATE (0.45 um) ☒ YES ☐ NO		
FILTRATE COLOR: Clear	FILTRATE ODOR: none	
QC SAMPLE: ☐ MS/MSD ☐ DUP-		
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1020	NA	7.54	1216	54.3	6.62	3.61	6.8	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☐ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☐ N
1			C	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☐ N
1			F	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Fedex	DATE SHIPPED: 2/28/22	AIRBILL NUMBER: ~~~~
COC NUMBER: ~~~~	SIGNATURE: [signature]	DATE SIGNED: 3/3/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW (JK) JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: OW-12 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1115	DATE: 2/28/22	SAMPLE	TIME: 1214	DATE: 2/28/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 17.25 T/ PVC

DEPTH TO BOTTOM: 23.44 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 10 ☒ LITERS ☐ GALLONS

COLOR: Orange ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 7.27 SU | CONDUCTIVITY: 627 umhos/cm

ORP: -173.8 mV | DO: 0.71 mg/L

TURBIDITY: 7.10 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 11.3 °C | OTHER: ——

COLOR: clear | ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear | FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☒ DUP- KLI

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1124	200	7.29	665	-82.1	1.67	110	12.5	17.34	INITIAL
1129	200	7.23	646	-144.0	1.07	49.6	11.4	17.34	1
1134	200	7.24	646	-152.8	0.93	42.4	11.5	17.34	2
1139	200	7.24	639	-157.2	0.82	36.8	11.3	17.34	3
1144	200	7.25	636	-161.3	0.83	21.0	11.4	17.34	4
1149	200	7.26	628	-164.8	0.79	17.4	10.9	17.34	5
1154	200	7.26	629	-167.5	0.75	13.2	11.0	17.34	6
1159	200	7.27	625	-169.8	0.73	11.69	11.1	17.34	7
1204	200	7.27	610	-169.7	0.84	8.53	10.9	17.34	8
1209	200	7.27	627	-173.2	0.69	7.46	11.4	17.34	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	Plastic	A	☐ Y ☒ N	4	60mL	VOA	A	☐ Y ☒ N
2	↓	↓	B	☐ Y ☒ N	2	40mL	VOA	E	☐ Y ☒ N
2			C	☐ Y ☒ N	2	40mL	VOA	E	☒ Y ☐ N
2			F	☐ Y ☒ N					☐ Y ☐ N
2	250mL		A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	2/28/22	AIRBILL NUMBER:	——
COC NUMBER:	——	SIGNATURE:		DATE SIGNED:	3/3/22

TRC

WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Co	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: OW-12

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1214	200	7.27	627	-173.8	0.71	7.10	11.3	17.34	10

SIGNATURE: [signature]

DATE SIGNED: 3/3/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED			CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW JK JJ	DATE 2/28/22		BY: AW	DATE 3/3/22

SAMPLE ID:	OW-10	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER	
WELL MATERIAL:	☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL		☐ OTHER
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI	☐ LEACHATE	☐ OTHER

PURGING	TIME: 1251	DATE: 2/28/22	SAMPLE	TIME: 1344	DATE 2/28/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.29 SU	CONDUCTIVITY: 562 umhos/cm	
			ORP: -147.3 mV	DO: 0.80 mg/L	
DEPTH TO WATER:	6.90 T/ PVC		TURBIDITY: 7.26 NTU		
DEPTH TO BOTTOM:	18.03 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 9.9 °C	OTHER:	
VOLUME REMOVED:	5.0 ☒ LITERS ☐ GALLONS		COLOR: clear	ODOR: none	
COLOR:	clear ODOR: none		FILTRATE (0.45 um) ☒ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR: none	
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD:	☒ GROUND ☐ DRUM ☐ OTHER		COMMENTS: FB-KLI collected		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1254	100	7.68	290.0	17.6	7.71	12.5	8.9	7.40	INITIAL
1259	100	7.43	298.4	21.2	5.88	13.1	9.8	7.84	.5
1304	100	7.37	371.5	8.8	4.45	13.6	9.9	8.00	1.0
1309	100	7.34	432.2	-18.5	3.23	12.1	9.2	7.90	1.5
1314	100	7.31	478.9	-53.8	2.38	11.7	9.5	7.91	2.0
1319	100	7.30	521	-104.5	1.47	10.1	9.8	7.94	2.5
1324	100	7.30	537	-124.1	1.13	9.81	9.7	7.94	3.0
1329	100	7.29	544	-132.6	0.97	8.62	9.8	7.94	3.5
1334	100	7.29	551	-143.3	0.88	8.57	9.8	7.94	4.0
1339	100	7.29	553	-146.9	0.83	7.92	9.8	7.94	4.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1			F	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	2/28/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	3/3/22

TRC

WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Co	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: OW-10

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1344	100	7.29	562	-147.3	0.80	7.26	9.9	7.94	5.0

SIGNATURE: [signature]

DATE SIGNED: 3/3/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW (JK) JJ	DATE: 2/28/22	BY: AW	DATE: 3/3/22

SAMPLE ID: DEK-MW-15003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1422	DATE: 2/28/22	SAMPLE	TIME: 1504	DATE: 2/28/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 8.07 SU	CONDUCTIVITY: 360.1 umhos/cm	
			ORP: -214.6 mV	DO: 0.82 mg/L	
DEPTH TO WATER:	16.98 T/ PVC		TURBIDITY: 3.15 NTU		
DEPTH TO BOTTOM:	27.98 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 15.9 °C	OTHER:	
VOLUME REMOVED:	8 ☒ LITERS ☐ GALLONS		COLOR: clear	ODOR: none	
COLOR:	clear ODOR: none		FILTRATE (0.45 um) ☒ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR: none	
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD:	☒ GROUND ☐ DRUM ☐ OTHER		COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1424	200	8.12	332.6	-13.1	2.41	9.03	14.4	17.81	INITIAL
1429	200	7.87	336.1	-40.3	1.43	4.69	15.1	18.34	1
1434	200	7.87	339.8	-79.5	1.10	4.12	15.4	18.74	2
1439	200	7.94	343.0	-129.5	0.96	3.72	15.4	18.92	3
1444	200	8.00	345.4	-166.6	0.91	3.56	15.4	18.94	4
1449	200	8.03	349.2	-187.0	0.87	3.63	15.6	18.95	5
1454	200	8.07	355.2	-205.0	0.84	4.17	15.9	18.95	6
1459	200	8.08	358.7	-210.2	0.83	3.06	15.9	18.95	7
1504	200	8.07	360.1	-214.6	0.82	3.15	15.9	18.95	8

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1	↓	↓	C	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓	↓	F	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	2/28/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	3/3/22

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER: 464095.0001.0000	BY: AW, (JK) JJ	DATE: 3/1/22	BY: AW	DATE: 3/3/22

SAMPLE ID: OW-11 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0805	DATE: 3/1/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 21.98 T/ PVC

DEPTH TO BOTTOM: 25.45 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4.5 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0854	DATE: 3/1/22

PH: 9.50 SU CONDUCTIVITY: 314.2 umhos/cm

ORP: 1.4 mV DO: 1.20 mg/L

TURBIDITY: 6.12 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 8.9 °C OTHER: —

COLOR: Clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0809	100	7.95	363.4	154.7	3.14	6.13	8.6	22.81	INITIAL
0814	100	9.23	324.6	104.6	2.31	6.76	8.6	23.22	.5
0819	100	9.39	311.5	83.4	1.92	6.37	8.5	23.20	1.0
0824	100	9.48	312.8	64.6	1.56	6.21	8.9	23.30	1.5
0829	100	9.48	314.8	49.2	1.31	6.42	8.9	23.42	2.0
0834	100	9.49	311.9	36.8	1.30	6.17	8.9	23.42	2.5
0839	100	9.49	313.3	22.8	1.24	5.78	8.9	23.50	3.0
0844	100	9.50	314.0	8.4	1.20	5.98	8.9	23.60	3.5
0849	100	9.50	315.5	6.2	1.20	5.62	8.9	23.62	4.0
0854	100	9.50	314.2	1.4	1.20	6.12	8.9	23.65	4.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1	↓	↓	C	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓	↓	F	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: FedEx	DATE SHIPPED: 3/1/22	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE: [signature]	DATE SIGNED: 3/3/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 3/1/22	BY: AW	DATE: 3/3/22

SAMPLE ID: DEK-MW-15005 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0924	DATE: 3/1/22	SAMPLE	TIME: 1005	DATE: ~~3~~ 3/1/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 10.10 T/ PVC

DEPTH TO BOTTOM: 22.30 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 7 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 7.50 SU CONDUCTIVITY: 956 umhos/cm

ORP: -197.3 mV DO: 0.63 mg/L

TURBIDITY: 3.98 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 10.0 °C OTHER:

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0930	200	7.56	778	80.9	2.29	5.39	9.2	10.33	INITIAL
0935	200	7.53	819	-17.7	1.16	5.12	9.7	10.33	1
0940	200	7.52	897	-160.0	0.86	4.78	9.7	10.33	2
0945	200	7.52	894	-179.8	0.75	5.35	9.7	10.33	3
0950	200	7.52	919	-186.3	0.72	3.62	9.7	10.33	4
0955	200	7.52	947	-192.4	0.67	3.81	10.0	10.33	5
1000	200	7.51	956	-195.4	0.64	4.12	10.1	10.33	6
1005	200	7.50	956	-197.3	0.63	3.98	10.0	10.33	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL		E	☒ Y ☐ N
1			F	☐ Y ☒ N					☐ Y ☐ N
1	250mL		A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	3/1/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/3/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 3/1/22	BY: AW	DATE: 3/3/22

SAMPLE ID: DEK-MW-15006 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1132	DATE: 3/1/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.72 T/ PVC

DEPTH TO BOTTOM: 21.50 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1203	DATE: 3/1/22

PH: 7.82 SU CONDUCTIVITY: 764 umhos/cm

ORP: -201.9 mV DO: 0.68 mg/L

TURBIDITY: 3.52 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 10.5 °C OTHER:

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS: FB - DEK-BAP collected

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1133	200	7.88	856	-79.1	2.08	6.19	10.5	9.89	INITIAL
1138	200	7.76	815	-145.5	0.92	5.48	10.5	9.89	1
1143	200	7.80	788	-178.5	0.79	3.26	10.5	9.89	2
1148	200	7.79	782	-181.9	0.77	3.59	10.6	9.89	3
1153	200	7.81	771	-193.8	0.71	3.42	10.5	9.89	4
1158	200	7.82	764	-200.1	0.68	3.68	10.5	9.89	5
1203	200	7.82	764	-201.9	0.68	3.52	10.5	9.89	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - Zinc Acetate

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	A	Plastic	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
2	↓	B	↓	☐ Y ☒ N	2	40mL	↓	E	☐ Y ☒ N
2	↓	C	↓	☐ Y ☒ N	2	40mL	↓	E	☒ Y ☐ N
2	↓	F	↓	☐ Y ☒ N					☐ Y ☐ N
1	250mL	A	↓	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	3/1/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	3/3/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED			CHECKED		
PROJECT NUMBER:	464095.0001.0000	BY: (AW) JK, JJ	DATE: 3/1/22		BY: JK	DATE: 3/3/22	

SAMPLE ID: MW-18001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 805	DATE: 3/1/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 8.49 T/ PVC

DEPTH TO BOTTOM: 19.65 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: —

TURBIDITY

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 835	DATE: 3/1/22

PH: 7.50 SU CONDUCTIVITY: 624 umhos/cm

ORP: -82.3 mV DO: 0.13 mg/L

TURBIDITY: 7.75 NTU

☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 8.1 °C OTHER: —

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: none

QC SAMPLE: ☒ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
805	100	7.52	635	103.2	1.00	25.44	7.9	8.49	INITIAL
810	|	7.50	632	-21.3	0.44	15.61	8.1	8.55	0.5
815	|	7.49	629	-42.2	0.28	11.25	8.3	|	1.0
820	|	7.49	631	-60.2	0.20	9.62	8.5	|	1.5
825	|	7.50	623	-77.5	0.15	9.31	8.0	|	2.0
830	|	7.50	624	-78.3	0.14	8.98	8.1	|	2.5
835	|	7.50	624	-82.3	0.13	7.75	8.1	|	3.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
3 | +	250	Plastic	A	☐ Y ☒ N	6-7	60	VOA	A	☐ Y ☑ N
+	125	|	B	☐ Y ☒ N	3-7	40	VOA	E	☑ Y ☐ N
+	125	|	A	☐ Y ☒ N	3	40	VOA	E	☐ Y ☑ N
+	125	|	D	☐ Y ☒ N					☐ Y ☐ N
+	125	|	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	3/1/22	AIRBILL NUMBER:	NA
COC NUMBER:	NM	SIGNATURE:	AW	DATE SIGNED:	3/2/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: (AW) JK, JJ	DATE: 3/1/22	BY: JK	DATE: 3/3/22

SAMPLE ID: DEK - MW-50[illegible]

WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 915	DATE: 3/1/22	SAMPLE	TIME: 940	DATE: 3/1/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.44 SU	CONDUCTIVITY: 707 umhos/cm	
			ORP: -48.5 mV	DO: 0.26 mg/L	
DEPTH TO WATER: 6.87 T/ PVC			TURBIDITY: 1.75 NTU		
DEPTH TO BOTTOM: 15.70 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 6.9 °C	OTHER: NA	
VOLUME REMOVED: 2.5 ☑ LITERS ☐ GALLONS			COLOR: Clear	ODOR: None	
COLOR: Clear	ODOR: None		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: Clear	FILTRATE ODOR: NO	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☒ DUP- DEK-BAP-01	
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR (L))
915	100	7.48	700	1.1	1.09	1.75	6.3	6.87	INITIAL
920	|	7.46	709	-14.5	0.72	1.66	6.5	|	0.5
925	|	7.45	712	-29.5	0.46	1.57	6.8	|	1.0
930	|	7.45	711	-38.9	0.36	1.80	7.0	|	1.5
935	|	7.44	707	-44.7	0.28	1.90	6.9	|	2.0
940	|	7.44	707	-48.5	0.26	1.75	6.9	|	2.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
3	250	Plastic	A	☐ Y ☑ N	4	60	VOA	A	☐ Y ☑ N
2	125	|	A	☐ Y ☑ N	2	40	|	E	☐ Y ☑ N
2	|	|	B	☐ Y ☑ N	2	40	|	E	☑ Y ☐ N
2	|	|	C	☐ Y ☑ N					☐ Y ☐ N
2	|	|	D	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	3/1/22	AIRBILL NUMBER:	NA
COC NUMBER:	NA	SIGNATURE:	AW	DATE SIGNED:	3/2/22

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Page ____ of ____

SAMPLING SITE / CUSTOMER: Q1-2022 DEK Bottom Ash Pond Wells

PROJECT NUMBER: 22-0144

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts
COPY TO: Harold Register
TRC

email: phone:

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	HNO3	H2SO4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0144-01	3/1/22	0940	GW	DEK-MW-15002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	3/1/22	1005	GW	DEK-MW-15005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	3/1/22	1203	GW	DEK-MW-15006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	3/1/22	—	GW	DUP-DEK-BAP-01	9	4	1	1	1	2			x	x	x	x	X	x	x	x	
-05	3/1/22	1203	GW	FB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	
-06	3/1/22	1220	GW	EB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 3/1/22 / 1945 RECEIVED BY: Fedex

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

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

Temperature: ____ °C Cal. Due Date: ____

ACS 3/3/22

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q1-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-0145

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0145-01	3/1/22	835	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	3/1/22	835	GW	DEK-MW-18001 MS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	3/1/22	835	GW	DEK-MW-18001 MSD	9	4	1	1	1	2			x	x	x	x	x	x	x	x	

ANALYSIS REQUESTED (Attach List if More Space is Needed)

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

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
[signature]	3/1/22 1134	Fedex
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS:

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

Temperature: _____ °C Cal. Due Date: _____

Aug 3/3/22

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SAMPLING SITE / CUSTOMER: Q1-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0146

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0146-01	2/28/22	1504	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	2/28/22	1344	GW	OW-10	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03			GW	~~OW-11~~	~~9~~	~~4~~	~~1~~	~~1~~	~~1~~	~~2~~			x	x	x	x	x		x	x	
-04	2/28/22	1214	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	2/28/22	1020	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-06	2/28/22	1000	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-07	2/28/22	0931	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-08	2/28/22	—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-09			W	~~EB-KLI~~	~~6~~	~~1~~	~~1~~	~~1~~	~~1~~	~~2~~			x	x	x			x	x	x	
-10	2/28/22	1344	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 2/28/22 / 1630 RECEIVED BY: FedEx

RELINQUISHED BY: Fed Ex DATE/TIME: 03-01-2022 / 1130 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 1.2 - 2.4 °C Cal. Due Date: 6-3-22

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SAMPLING SITE / CUSTOMER: Q1-2022 DEK Lined Impoundment	PROJECT NUMBER: 22-0146	SAP CC or WO#:	ANALYSIS REQUESTED (Attach List if More Space is Needed)
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____	REQUESTER: Harold Register	QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register; TRC	MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste		

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
~~22-0146-01~~			~~GW~~	~~DEK-MW-15003~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-02~~			~~GW~~	~~OW-10~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	3/1/22	0854	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-04~~			~~GW~~	~~OW-12~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-05~~			~~W~~	~~KLI-SCS~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-06~~			~~SW~~	~~KLI-PCS~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-07~~			~~SW~~	~~SW-DITCH~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
~~-08~~			~~GW~~	~~DUP-KLI~~	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-09	3/1/22	0915	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	
~~-10~~			~~W~~	~~FB-KLI~~	6	1	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
[signature]	3/1/22 1345	Fedex
[signature]	03-02-22 1130	[signature]

COMMENTS:

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

Temperature: 3.0 °C Cal. Due Date: 6-3-22

09.27.22

Appendix C
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event March 2022
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the March 2022 sampling event. The sample was analyzed for total metals, anions, total dissolved solids, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 22-0145R.

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

- DEK-MW-18001

The sample was analyzed for the following constituents:

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

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

Data Usability Review Procedure

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

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

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- A field blank was not collected with this data set.
- An equipment blank was not collected with this data set.
- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, and alkalinity. The recoveries were within the acceptance limits. Relative percent differences (RPDs) were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review
Groundwater Monitoring Event February and March 2022
DE Karn Lined Impoundment

Groundwater, water, and surface water samples were collected by TRC for the February and March 2022 sampling event. Samples were analyzed for total metals, anions, total dissolved solids, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 22-0146.

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

- OW-10
- OW-11
- OW-12
- DEK-MW-15003

During the February and March 2022 sampling event, the following water/surface water samples were collected:

- KLI-SCS
- KLI-PCS
- SW-DITCH

Each sample was analyzed for the following constituents:

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

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

Data Usability Review Procedure

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

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

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- One field blank (FB-KLI) and one equipment blank (EB-KLI) were collected with this data set. Total metals were not detected in the blank samples.
- MS and MSD analyses were not performed on a sample from this data set.
- The field duplicate pair samples were DUP-KLI with OW-12; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Appendix D
Statistical Analysis

Appendix D
Statistical Summary for DE Karn Lined Impoundment
First Quarter 2022
Data from May 2020 to February 2022

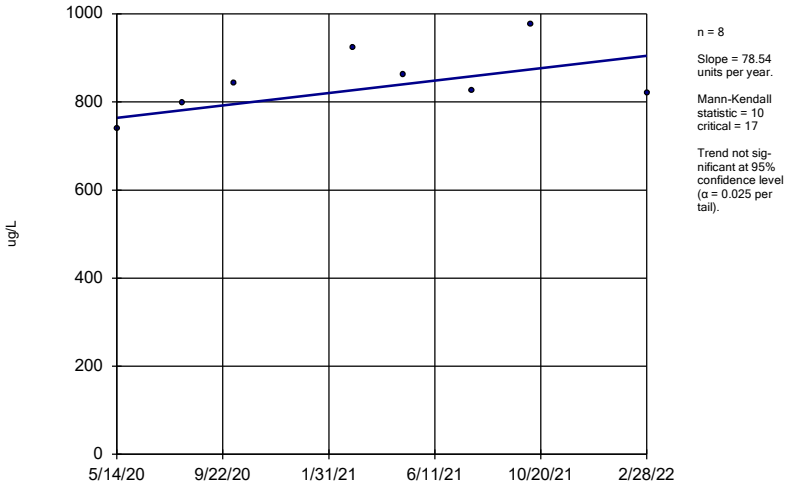
Karn Lined Impoundment Wells						
PARAMETER	**Range, Test, or Limit**	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**
Boron	Trend	O	O	O	↑ ASD	O
Calcium	Trend	O	O	O	↓	O
Chloride	Trend	↑ ASD	O	O	↓*	O
Fluoride	Trend	O*	O	O*	↓*	O*
Iron	Trend	O	↑* ASD	O	O	O
pH	Trend	O	O	O	↑ ASD	O
Sulfate	Trend	O	↑ ASD	O	O	O
Total Dissolved Solids	Trend	O	O	O	↓	O

Notes:

O* = Non-detect
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (First Quarter 2022 Hydrogeological Monitoring Report for the Karn Lined Impoundment CCR Unit, TRC, April 2022.)

Boron, Total

DEK-MW-15003



n = 8

Slope = 78.54 units per year.

Mann-Kendall statistic = 10 critical = 17

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

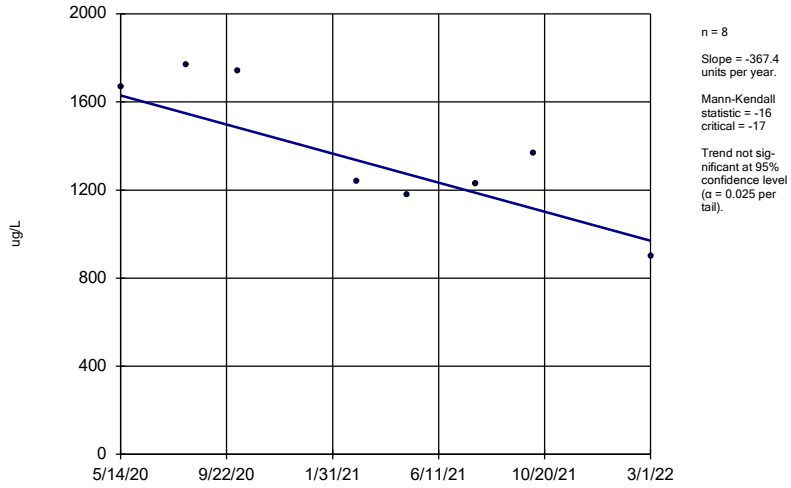
Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Boron, Total

DEK-MW-18001



n = 8

Slope = -367.4 units per year.

Mann-Kendall statistic = -16 critical = -17

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

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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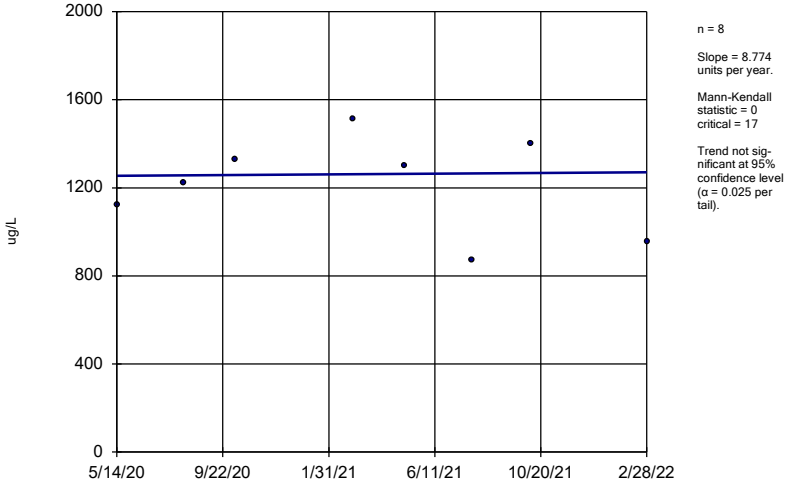
Boron, Total

OW-10



n = 8

Slope = 8.774 units per year.

Mann-Kendall statistic = 0 critical = 17

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

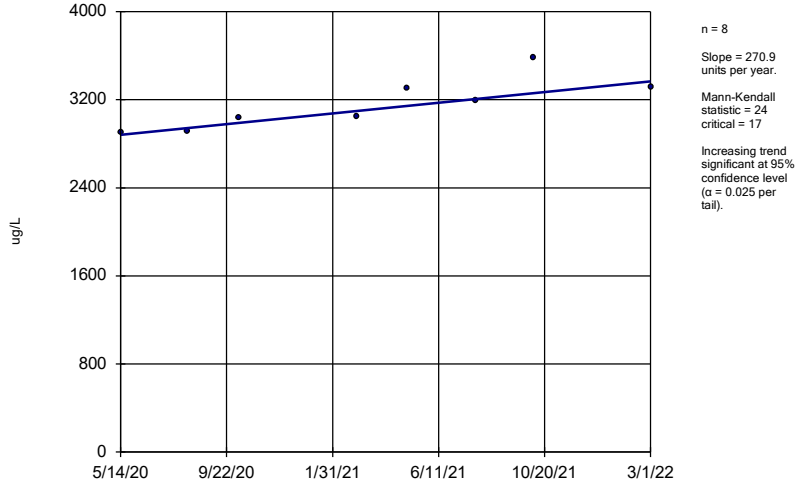
Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Boron, Total

OW-11



n = 8

Slope = 270.9 units per year.

Mann-Kendall statistic = 24 critical = 17

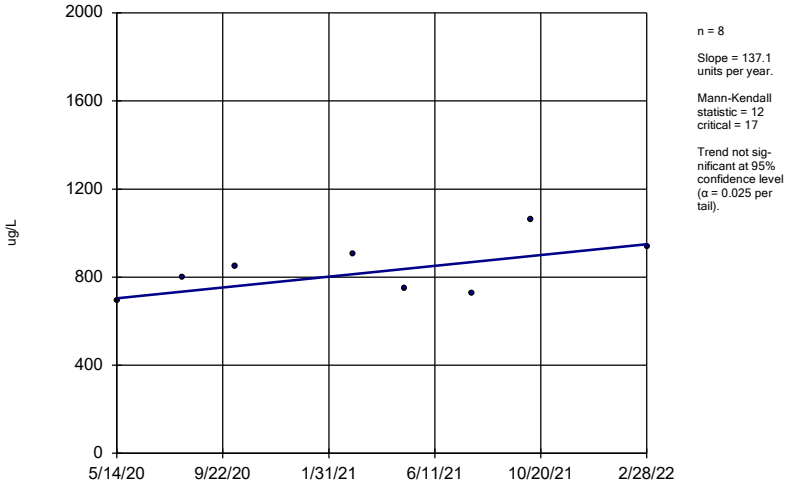
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Boron, Total

OW-12



n = 8

Slope = 137.1 units per year.

Mann-Kendall statistic = 12 critical = 17

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

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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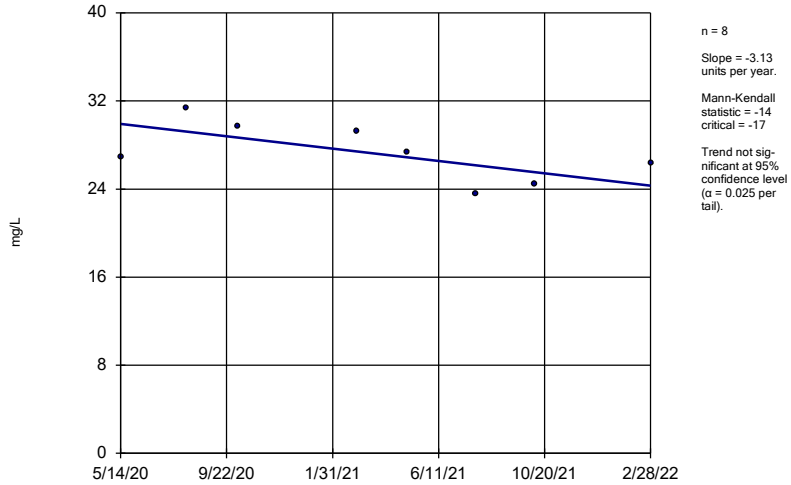
Calcium, Total

DEK-MW-15003



n = 8

Slope = -3.13 units per year.

Mann-Kendall statistic = -14 critical = -17

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

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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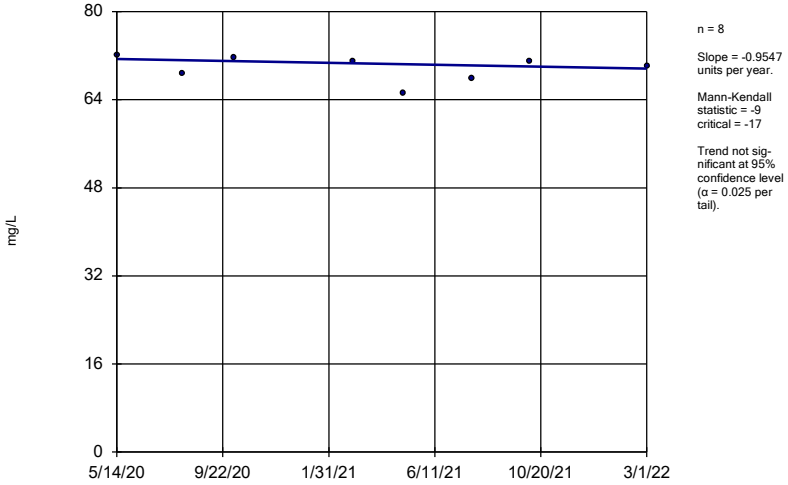
Calcium, Total

DEK-MW-18001



n = 8

Slope = -0.9547 units per year.

Mann-Kendall statistic = -9 critical = -17

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

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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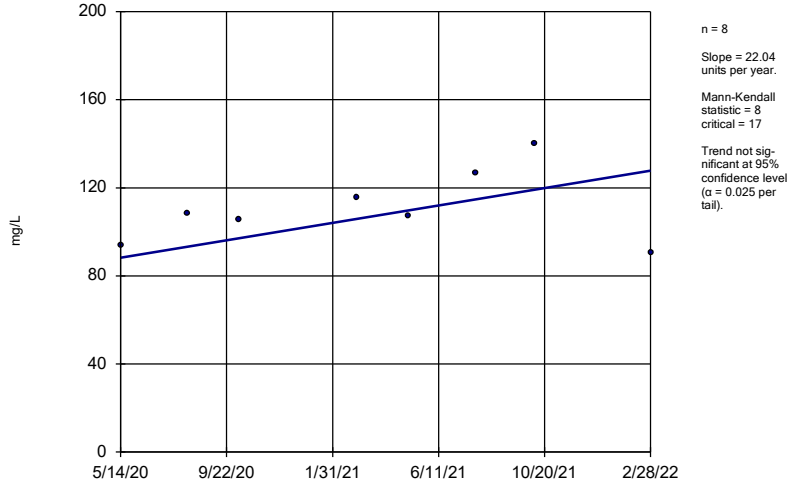
Calcium, Total

OW-10



n = 8

Slope = 22.04 units per year.

Mann-Kendall statistic = 8 critical = 17

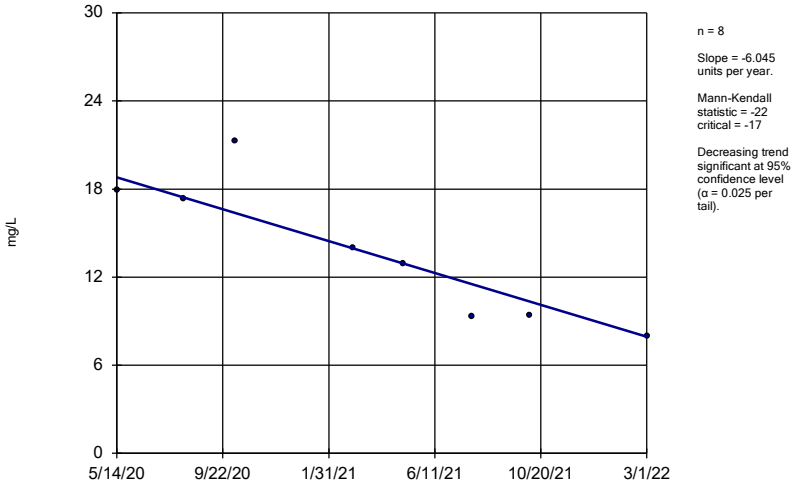
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Calcium, Total

OW-11



n = 8

Slope = -6.045 units per year.

Mann-Kendall statistic = -22
critical = -17

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

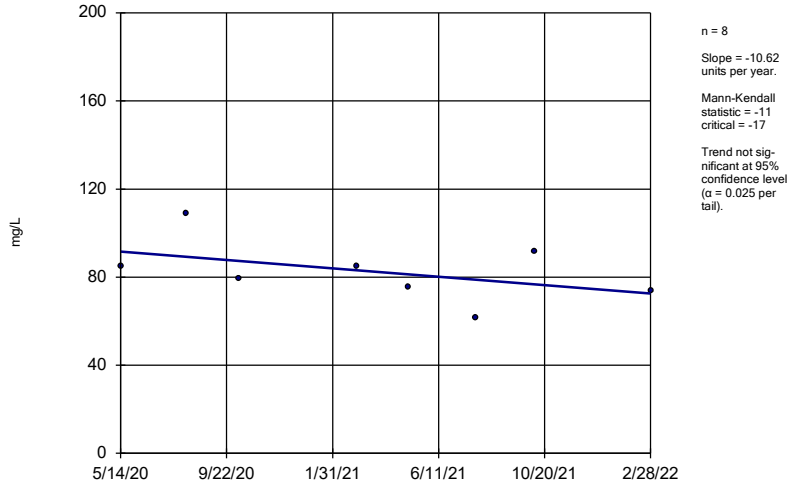
Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Calcium, Total

OW-12



n = 8

Slope = -10.62 units per year.

Mann-Kendall statistic = -11
critical = -17

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

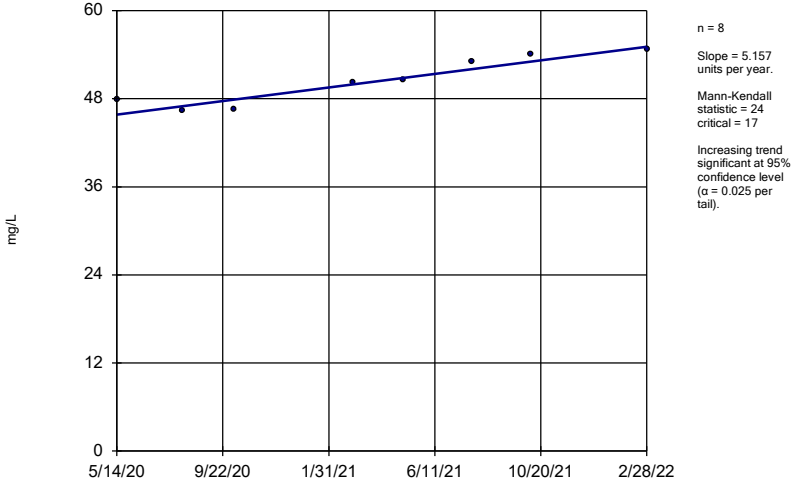
Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Chloride

DEK-MW-15003



n = 8

Slope = 5.157 units per year.

Mann-Kendall statistic = 24
critical = 17

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

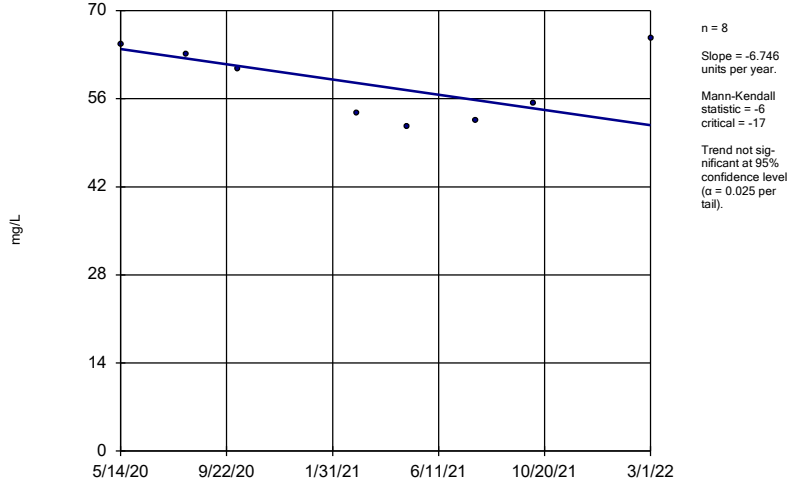
Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Chloride

DEK-MW-18001



n = 8

Slope = -6.746 units per year.

Mann-Kendall statistic = -6
critical = -17

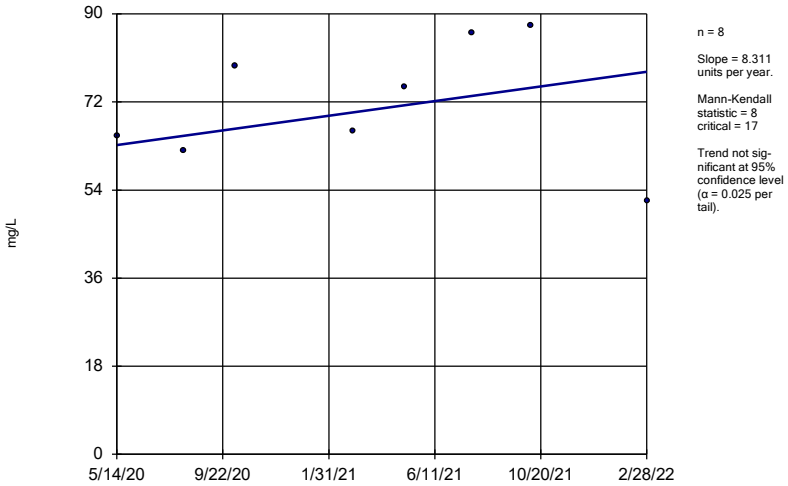
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Chloride

OW-10



n = 8

Slope = 8.311 units per year.

Mann-Kendall statistic = 8
critical = 17

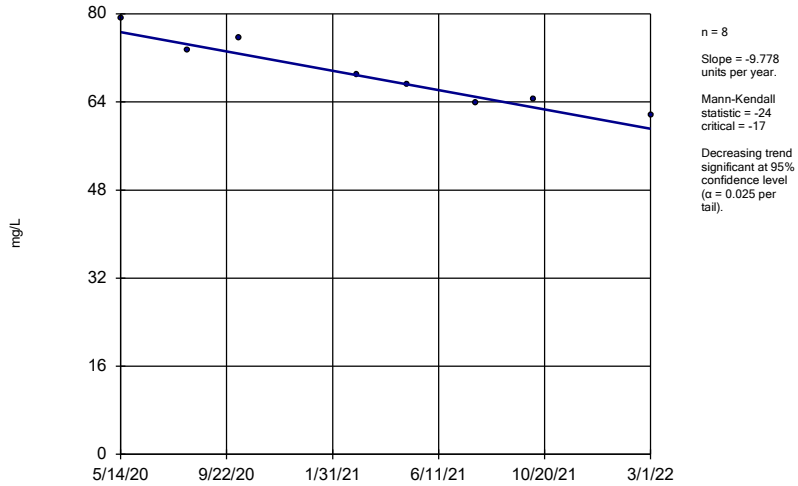
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:47 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Chloride

OW-11



n = 8

Slope = -9.778 units per year.

Mann-Kendall statistic = -24
critical = -17

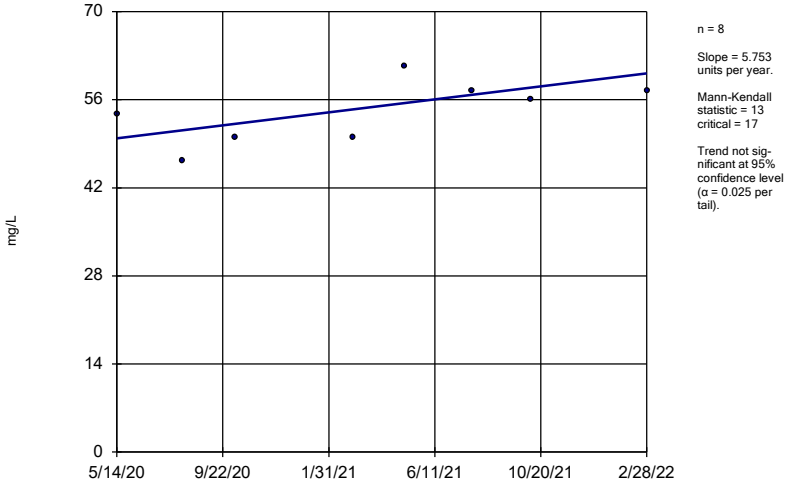
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Chloride

OW-12



n = 8

Slope = 5.753 units per year.

Mann-Kendall statistic = 13
critical = 17

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

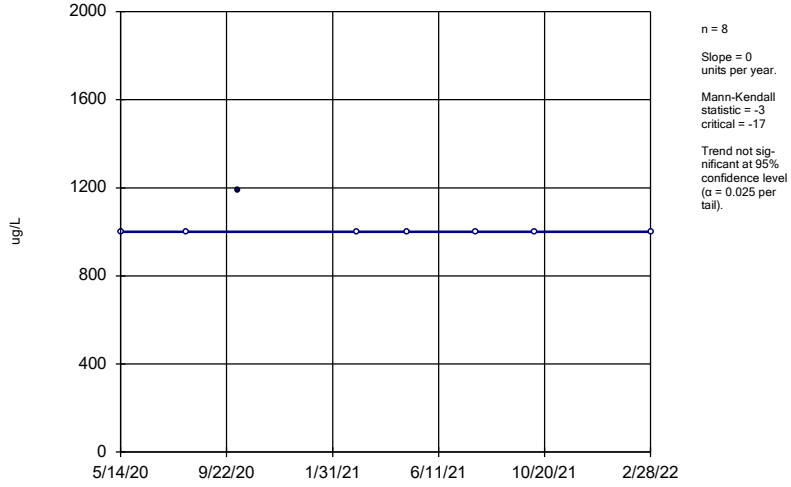
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Hollow symbols indicate censored values.

Fluoride

DEK-MW-15003



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -3
critical = -17

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

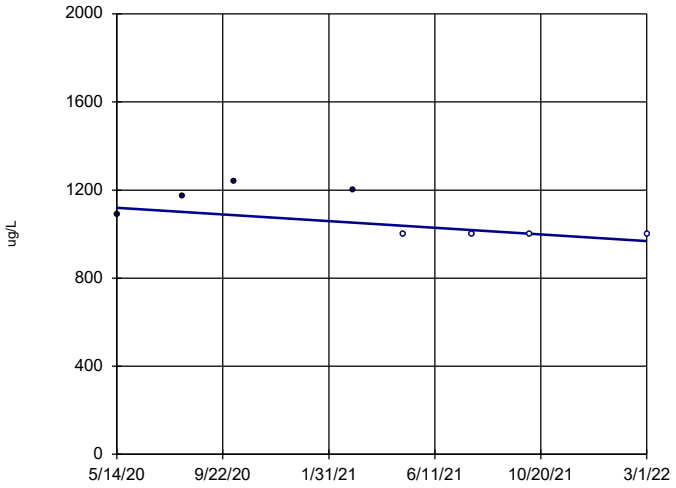
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Fluoride

DEK-MW-18001



n = 8

Slope = -83.81 units per year.

Mann-Kendall statistic = -12
critical = -17

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

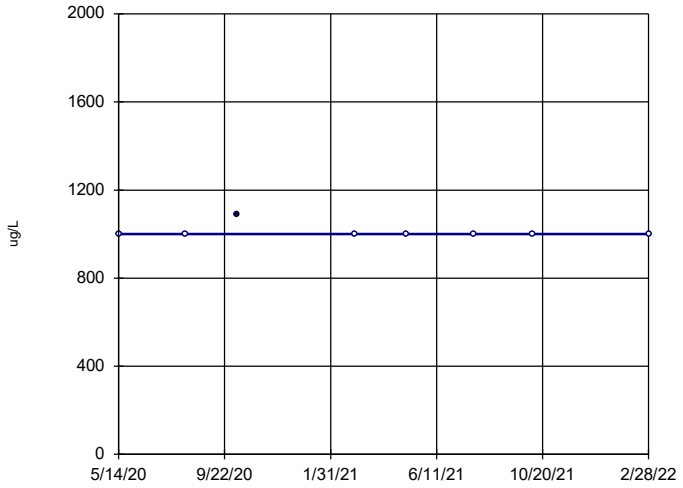
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Fluoride

OW-10



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -3
critical = -17

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

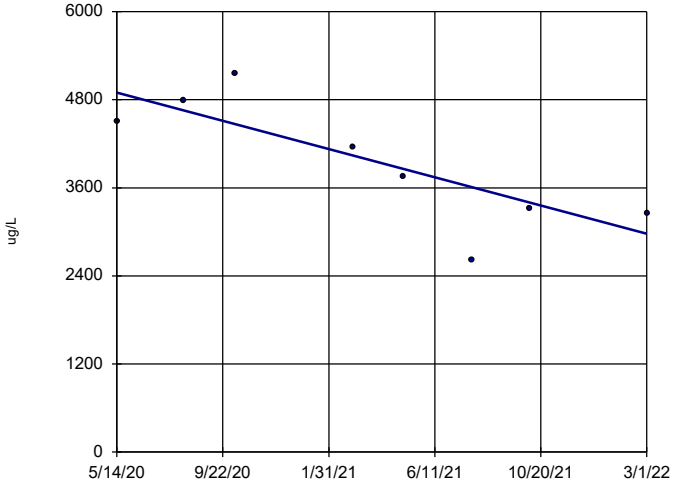
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Fluoride

OW-11



n = 8

Slope = -1071 units per year.

Mann-Kendall statistic = -18
critical = -17

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

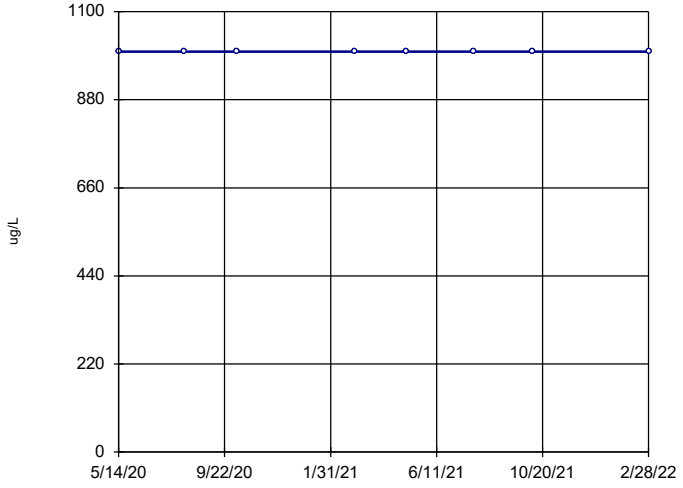
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Fluoride

OW-12



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 17

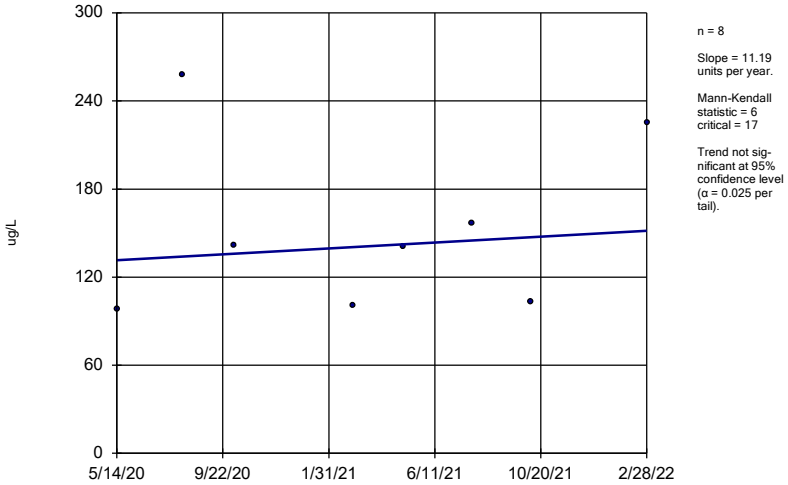
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Iron, Total

DEK-MW-15003



n = 8

Slope = 11.19 units per year.

Mann-Kendall statistic = 6
critical = 17

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

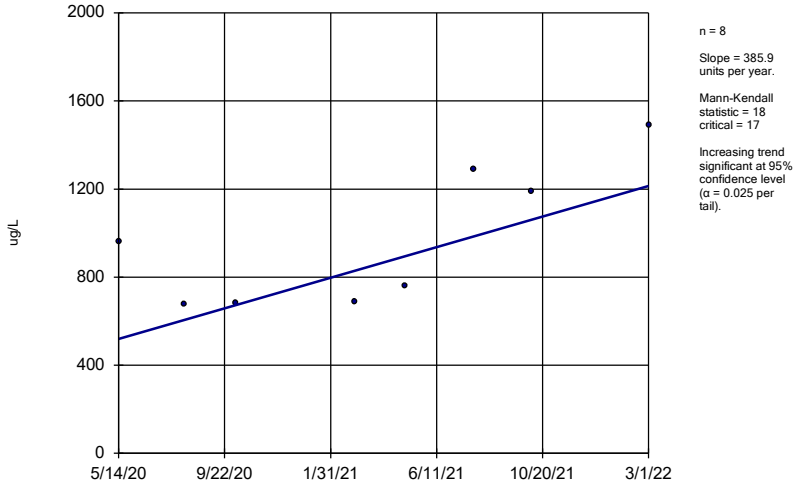
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Iron, Total

DEK-MW-18001



n = 8

Slope = 385.9 units per year.

Mann-Kendall statistic = 18
critical = 17

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

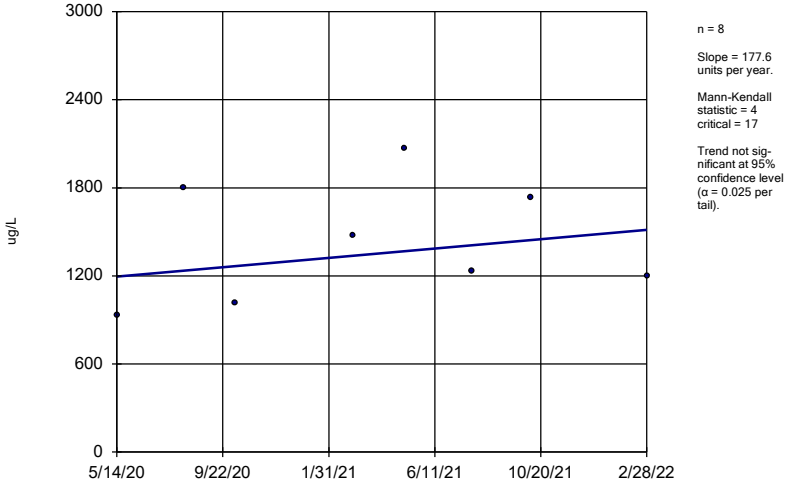
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Iron, Total

OW-10



n = 8

Slope = 177.6 units per year.

Mann-Kendall statistic = 4
critical = 17

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

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

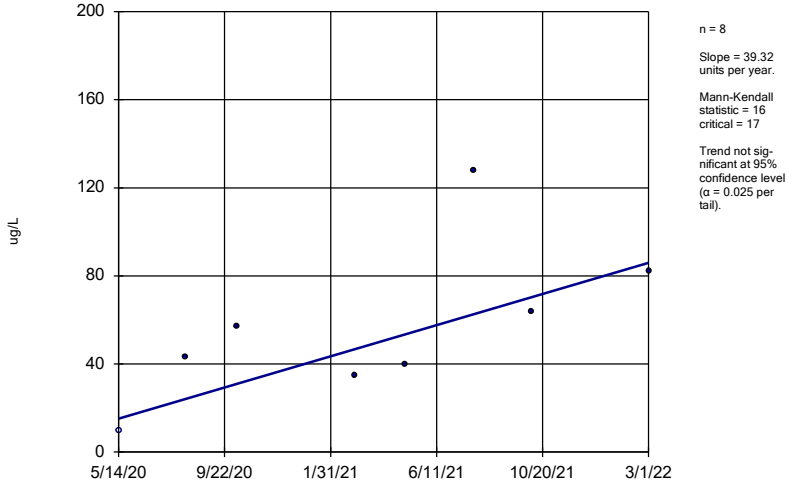
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Hollow symbols indicate censored values.

Iron, Total

OW-11



n = 8

Slope = 39.32 units per year.

Mann-Kendall statistic = 16
critical = 17

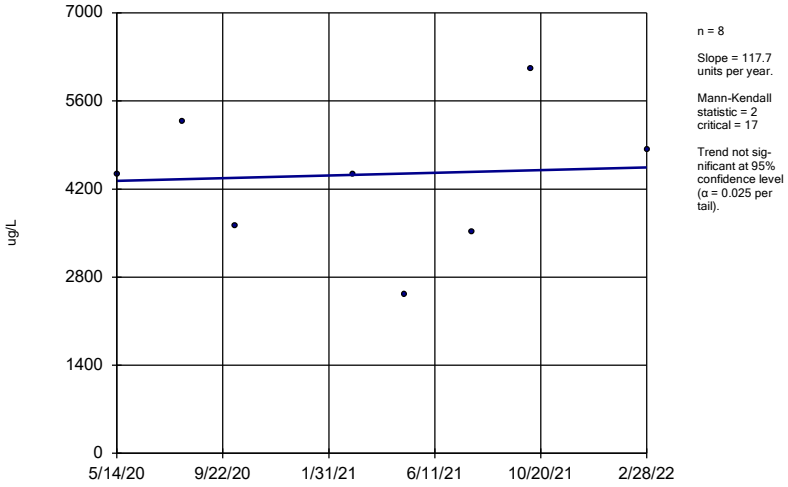
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Iron, Total

OW-12



n = 8

Slope = 117.7 units per year.

Mann-Kendall statistic = 2 critical = 17

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

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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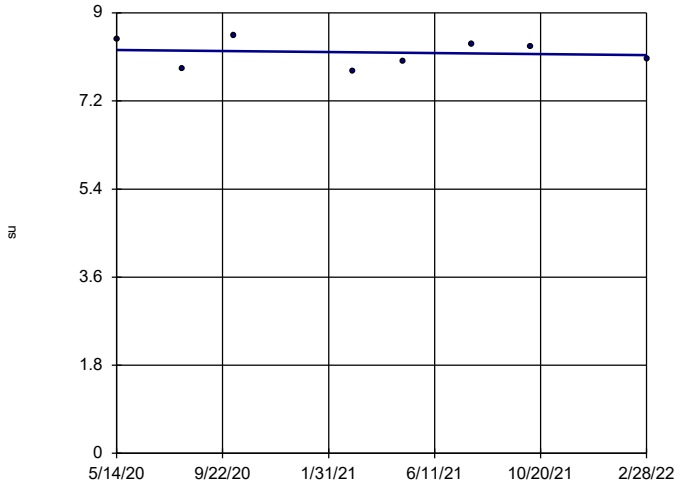
pH, Field

DEK-MW-15003



n = 8

Slope = -0.05921 units per year.

Mann-Kendall statistic = -2 critical = -17

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

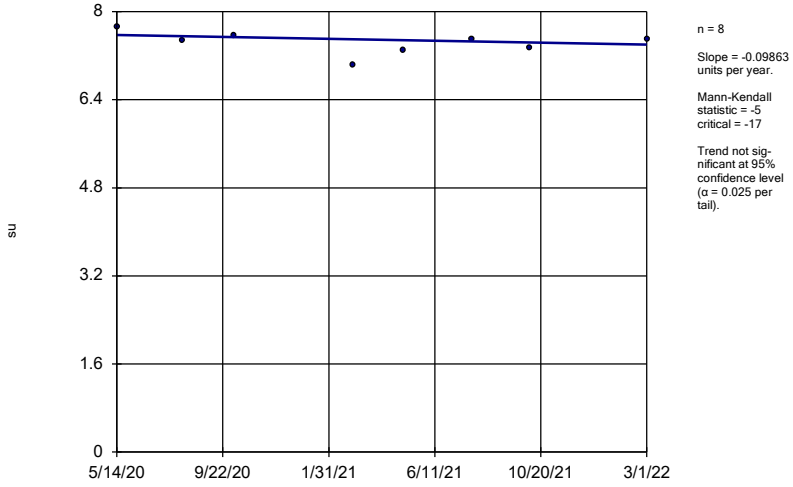
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

pH, Field

DEK-MW-18001



n = 8

Slope = -0.09863 units per year.

Mann-Kendall statistic = -5 critical = -17

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

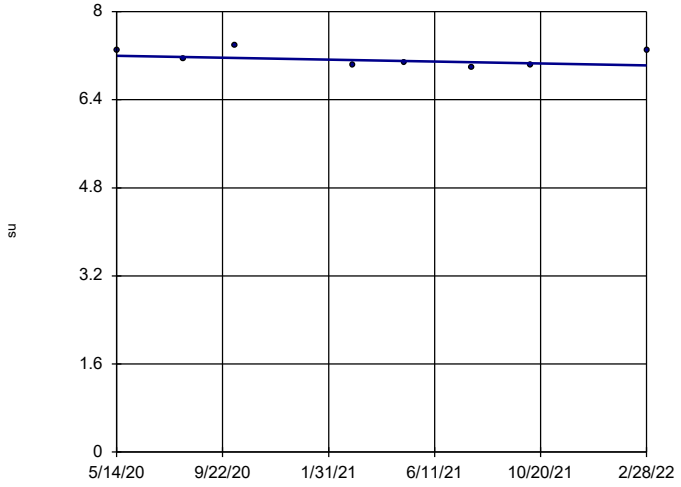
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

pH, Field

OW-10



n = 8

Slope = -0.09645 units per year.

Mann-Kendall statistic = -8 critical = -17

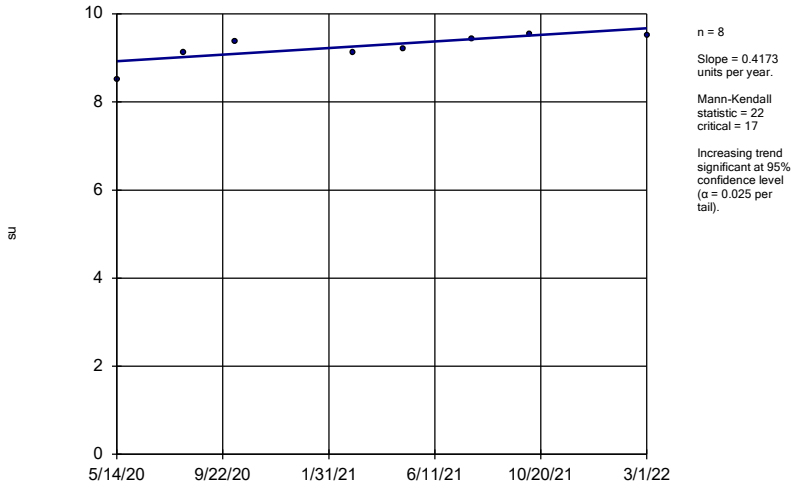
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

pH, Field

OW-11



n = 8

Slope = 0.4173 units per year.

Mann-Kendall statistic = 22
critical = 17

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

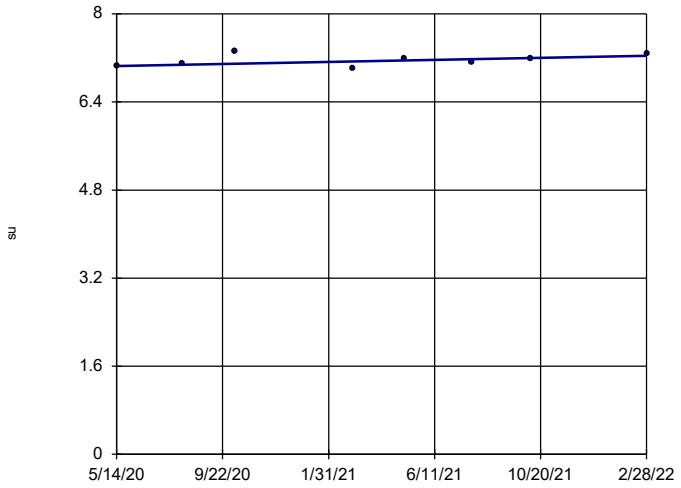
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

pH, Field

OW-12



n = 8

Slope = 0.1059 units per year.

Mann-Kendall statistic = 10
critical = 17

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

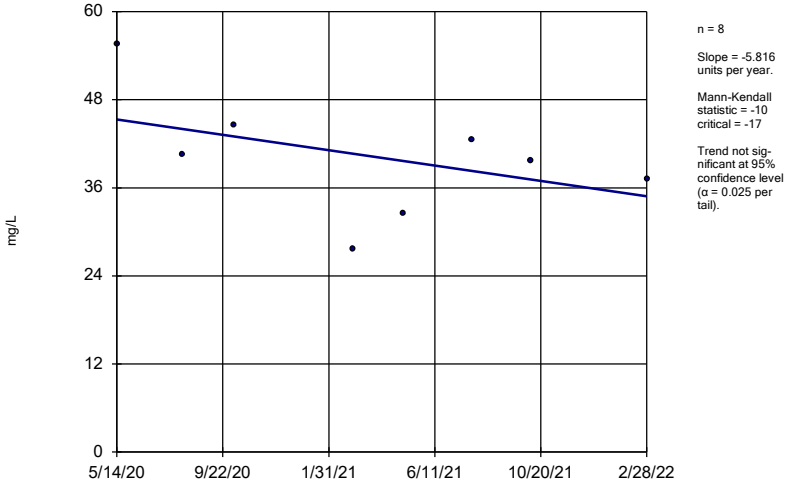
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Sulfate

DEK-MW-15003



n = 8

Slope = -5.816 units per year.

Mann-Kendall statistic = -10
critical = -17

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

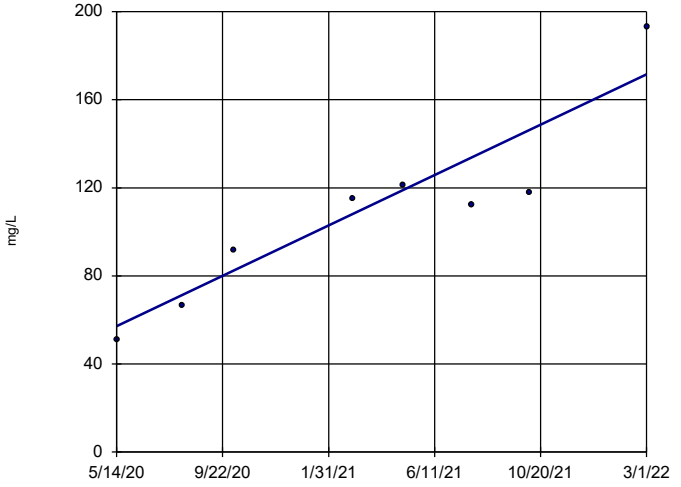
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Sulfate

DEK-MW-18001



n = 8

Slope = 63.6 units per year.

Mann-Kendall statistic = 22
critical = 17

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

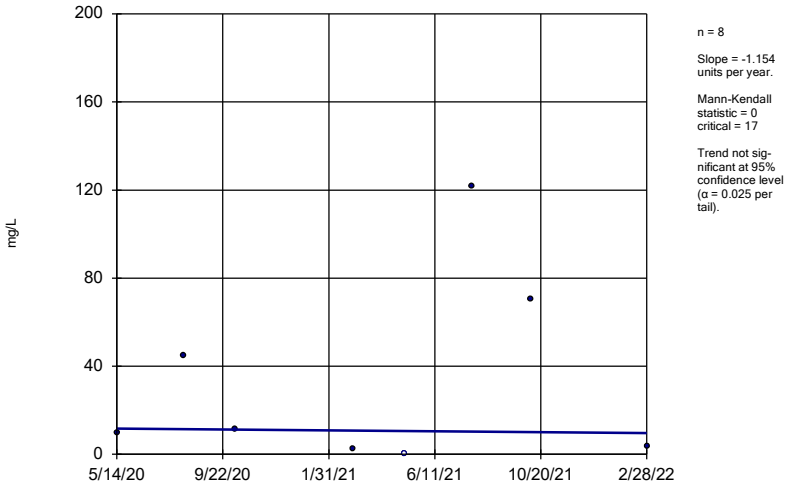
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Hollow symbols indicate censored values.

Sulfate

OW-10



n = 8

Slope = -1.154 units per year.

Mann-Kendall statistic = 0
critical = 17

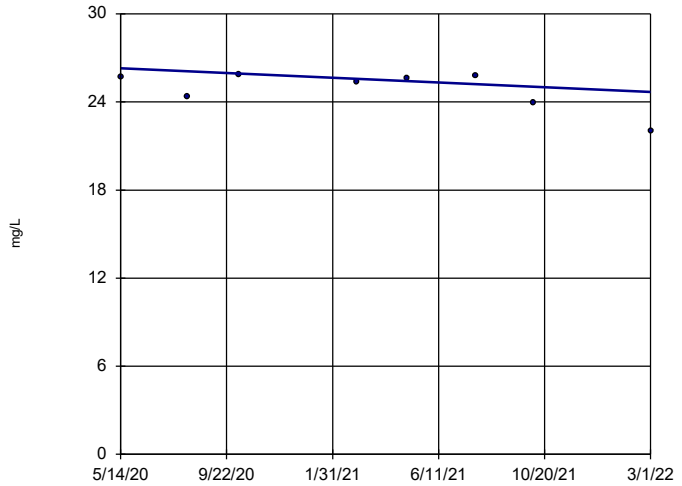
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Sulfate

OW-11



n = 8

Slope = -0.8925 units per year.

Mann-Kendall statistic = -10
critical = -17

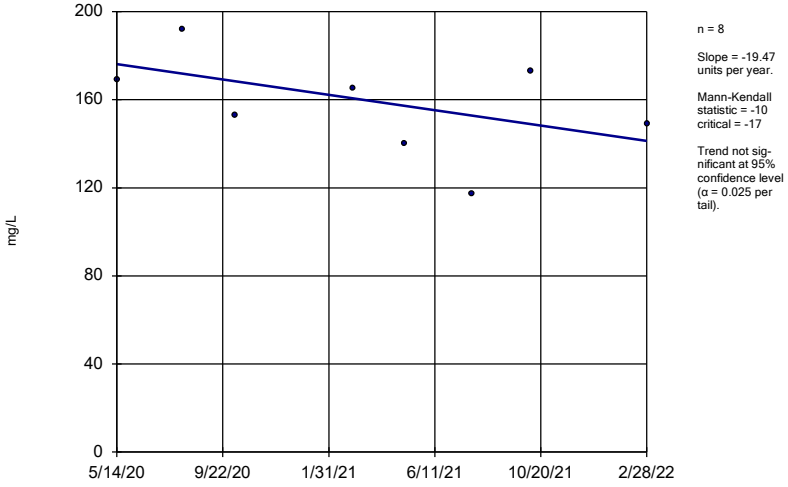
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Sulfate

OW-12



n = 8

Slope = -19.47 units per year.

Mann-Kendall statistic = -10
critical = -17

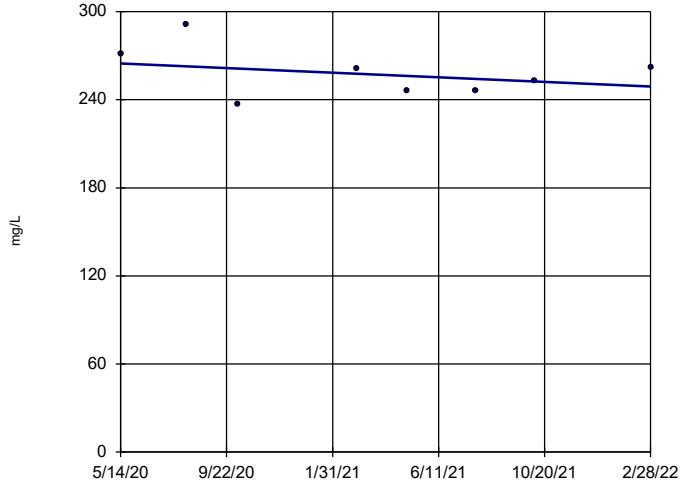
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Total Dissolved Solids

DEK-MW-15003



n = 8

Slope = -8.758 units per year.

Mann-Kendall statistic = -3
critical = -17

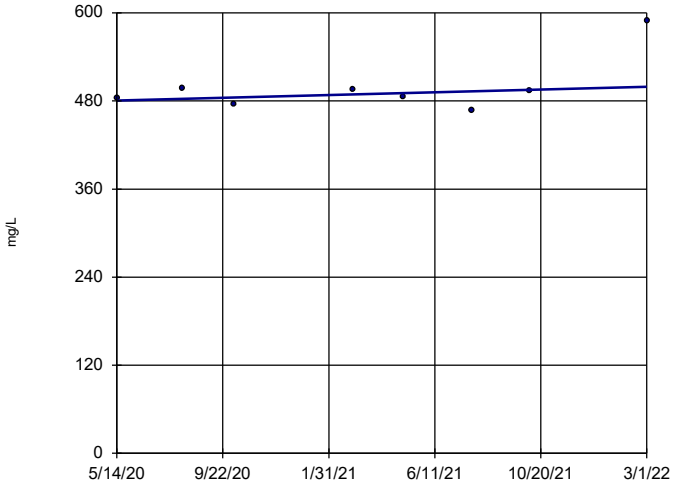
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

Total Dissolved Solids

DEK-MW-18001



n = 8

Slope = 10.45 units per year.

Mann-Kendall statistic = 4
critical = 17

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

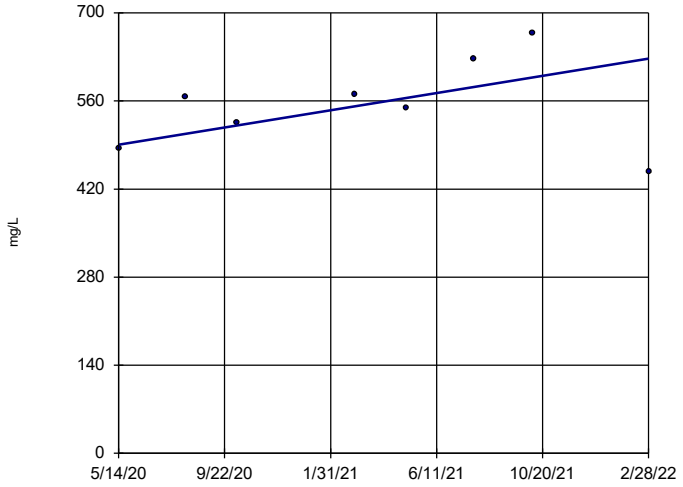
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Total Dissolved Solids

OW-10



n = 8

Slope = 76.38 units per year.

Mann-Kendall statistic = 8
critical = 17

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

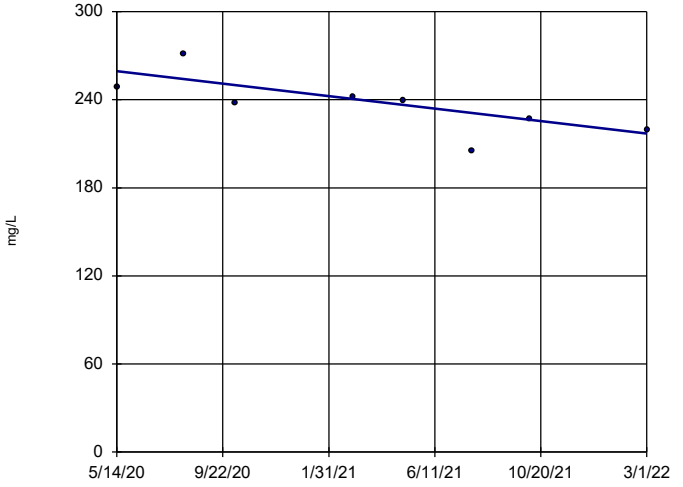
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Total Dissolved Solids

OW-11



n = 8

Slope = -23.66 units per year.

Mann-Kendall statistic = -18
critical = -17

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

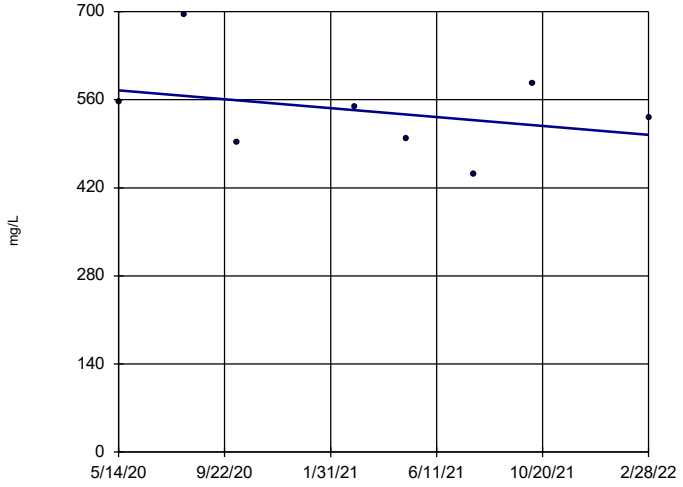
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

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

Total Dissolved Solids

OW-12



n = 8

Slope = -39.38 units per year.

Mann-Kendall statistic = -6
critical = -17

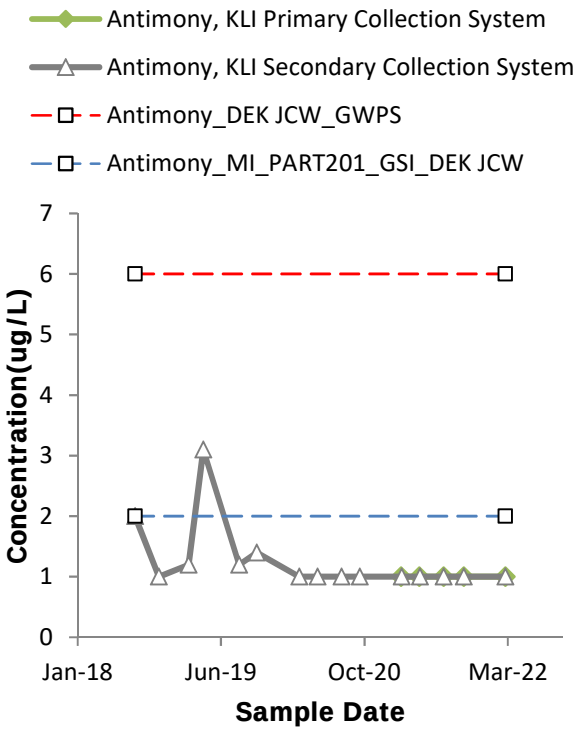
Trend not significant at 95% confidence level (α = 0.025 per tail).

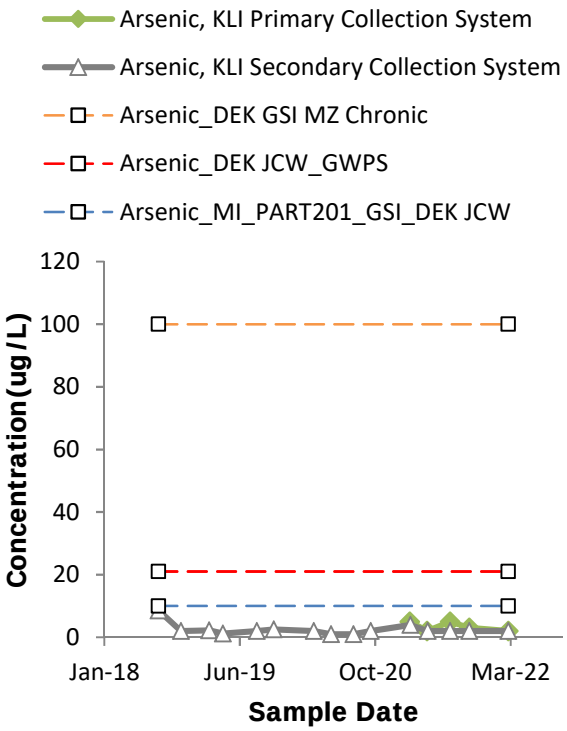
Sen's Slope Estimator Analysis Run 4/12/2022 2:48 PM

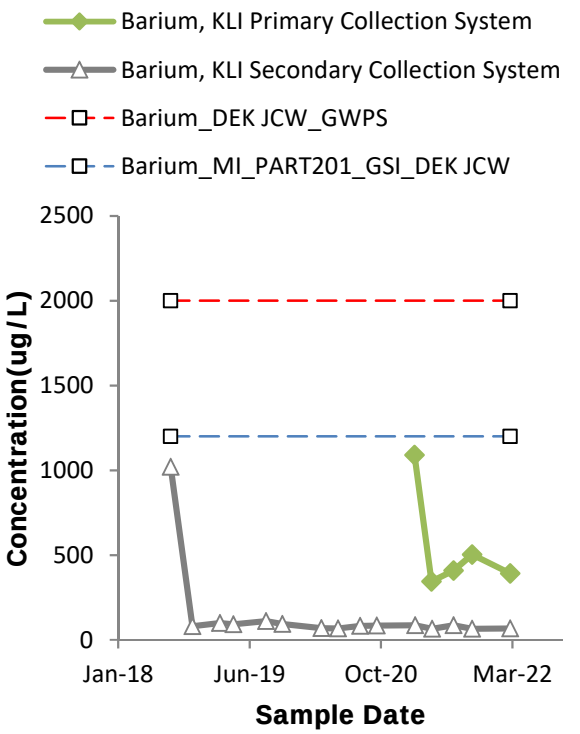
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q1

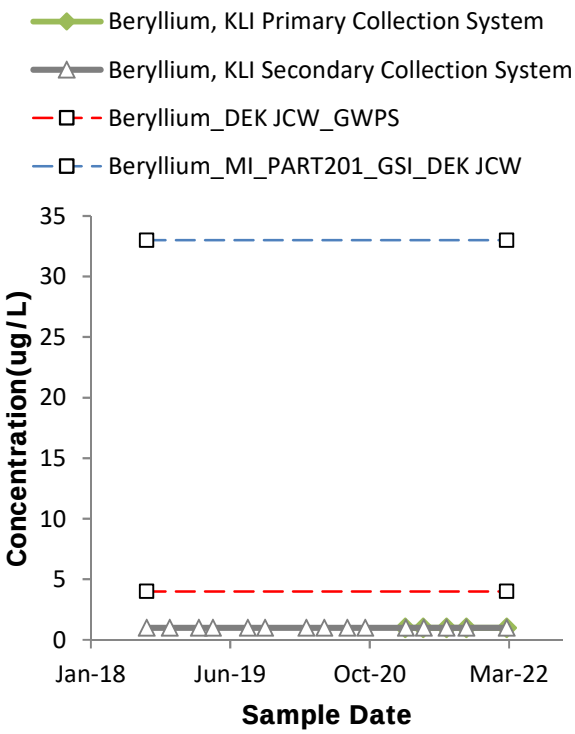
Appendix E
Secondary Leachate Collection System Monitoring

Water Quality Time Series

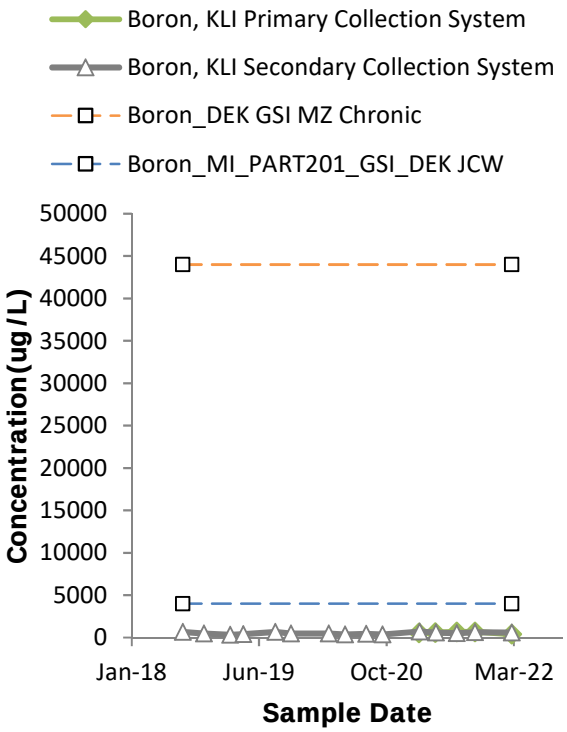


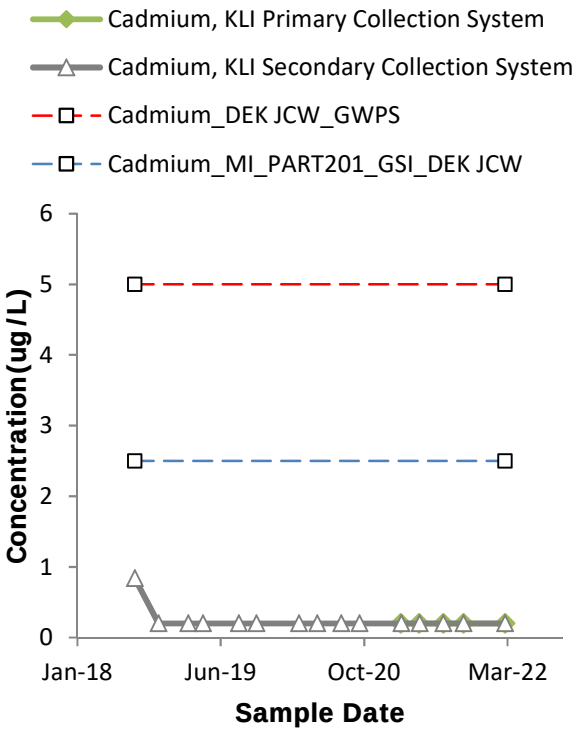


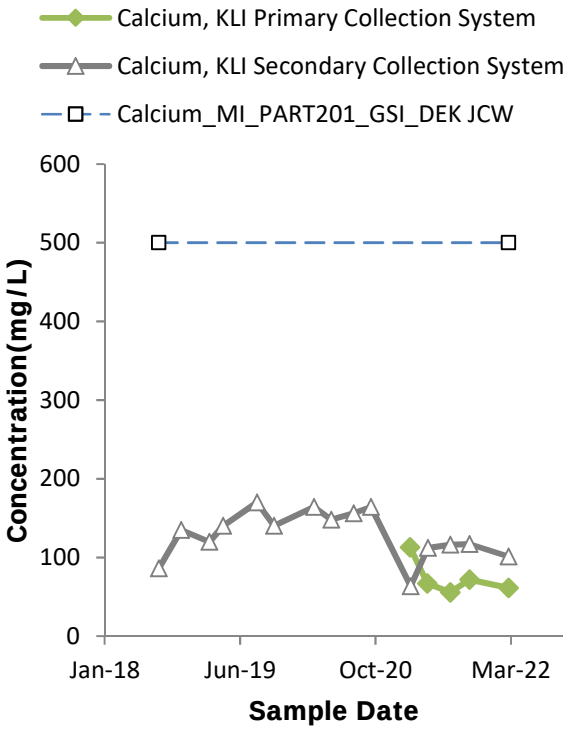


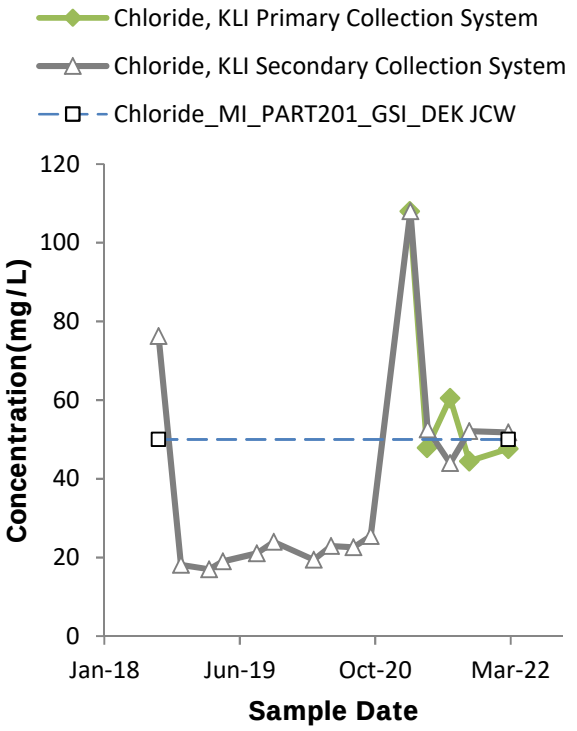


Water Quality Time Series

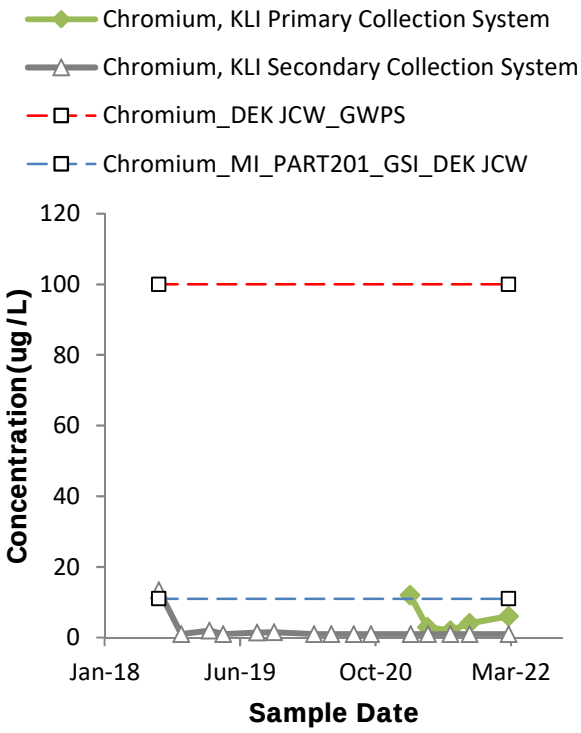


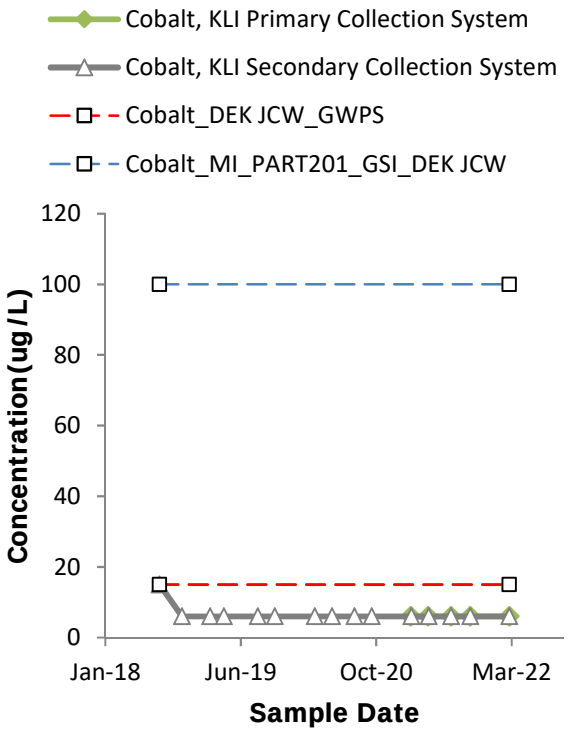


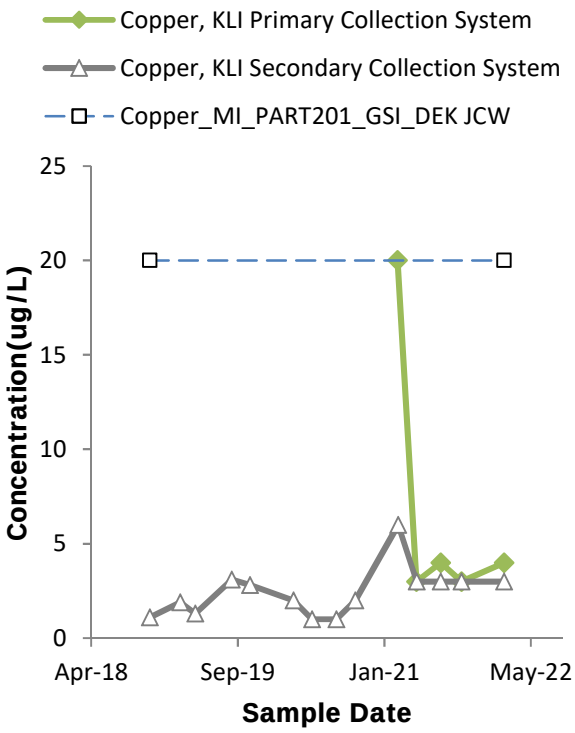


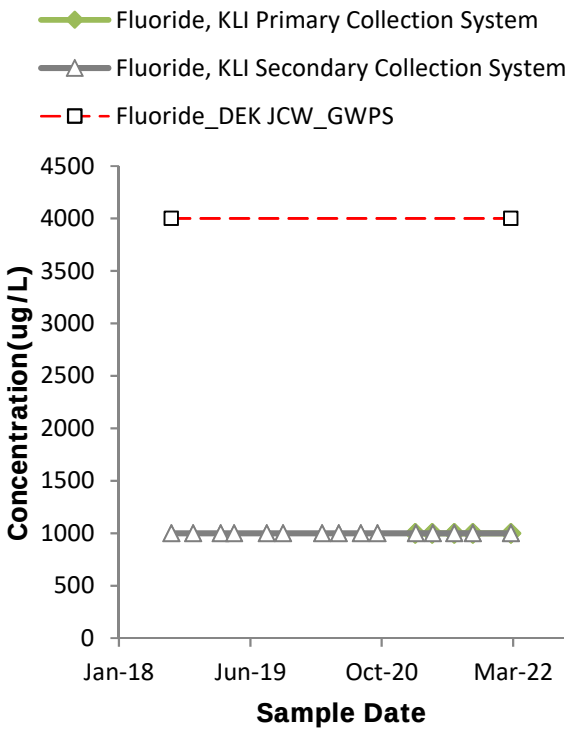


Water Quality Time Series

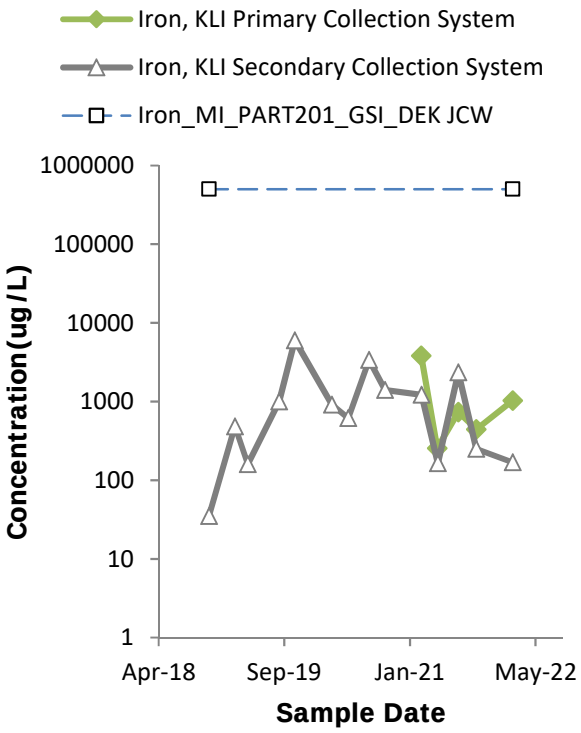


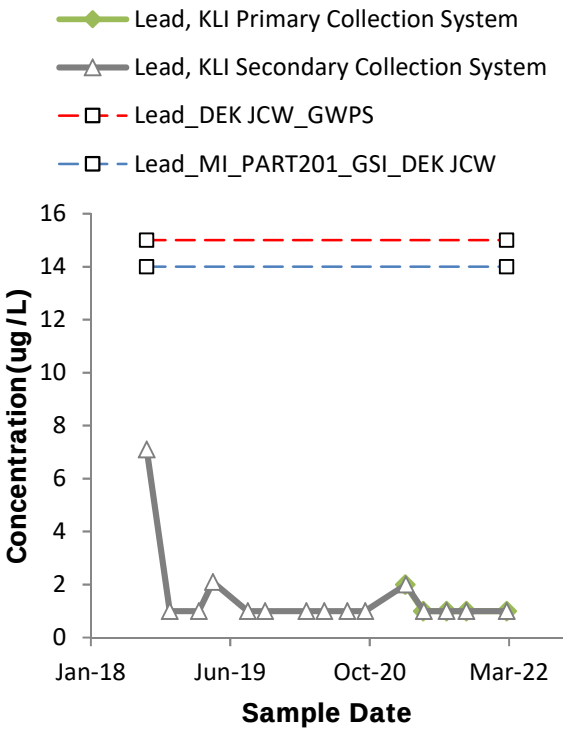


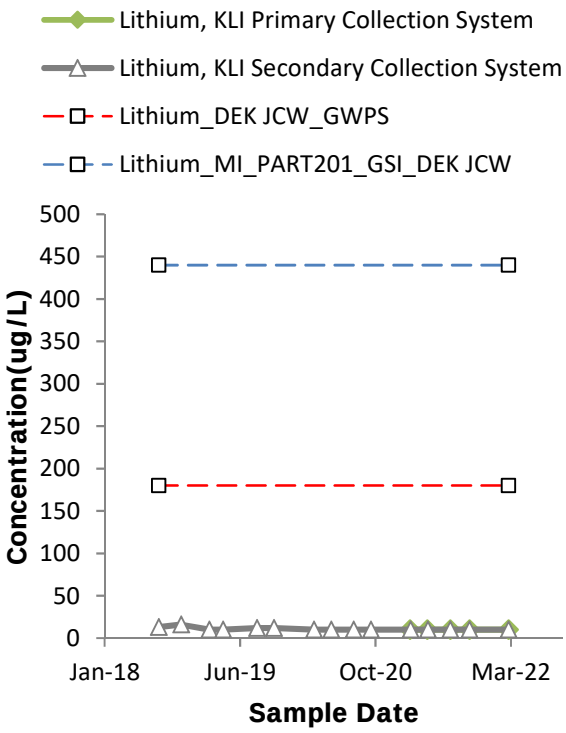


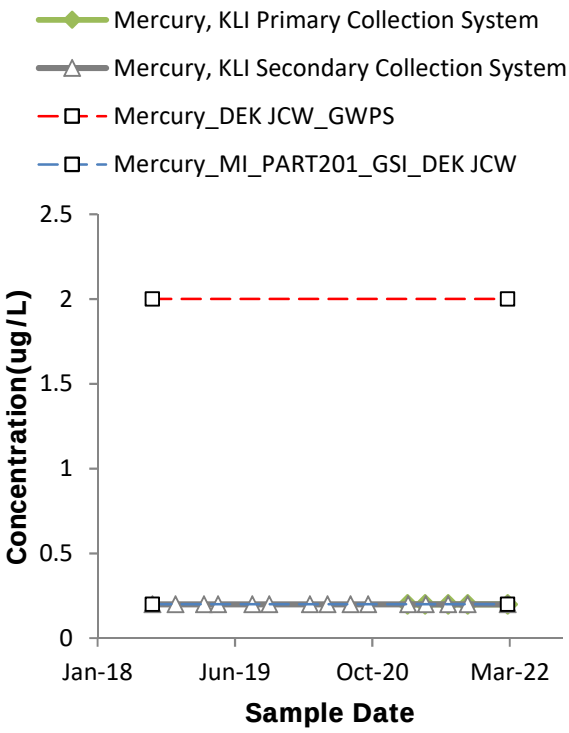


Water Quality Time Series

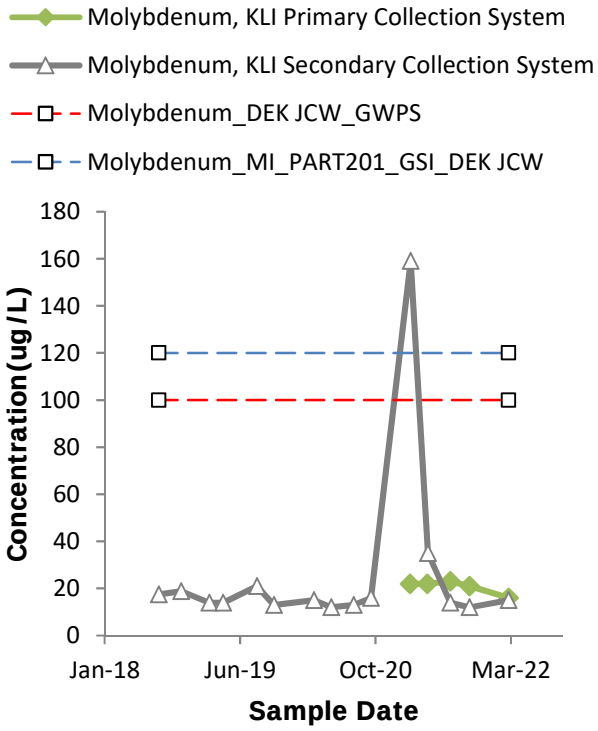


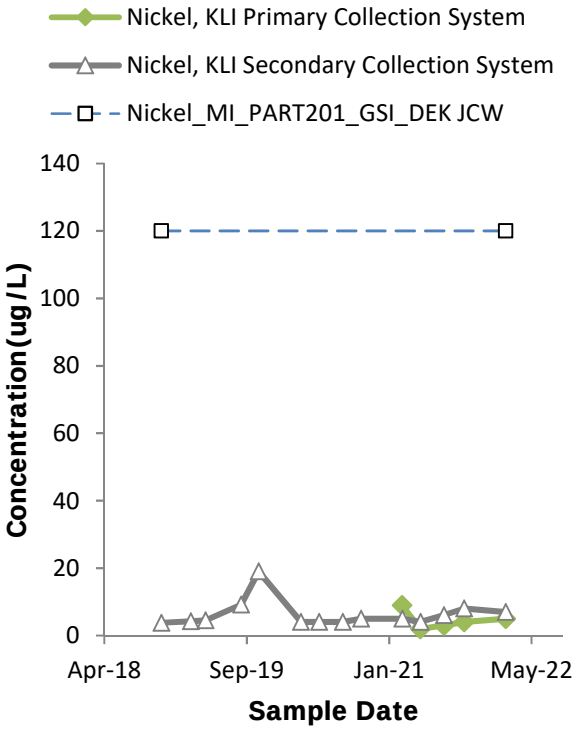


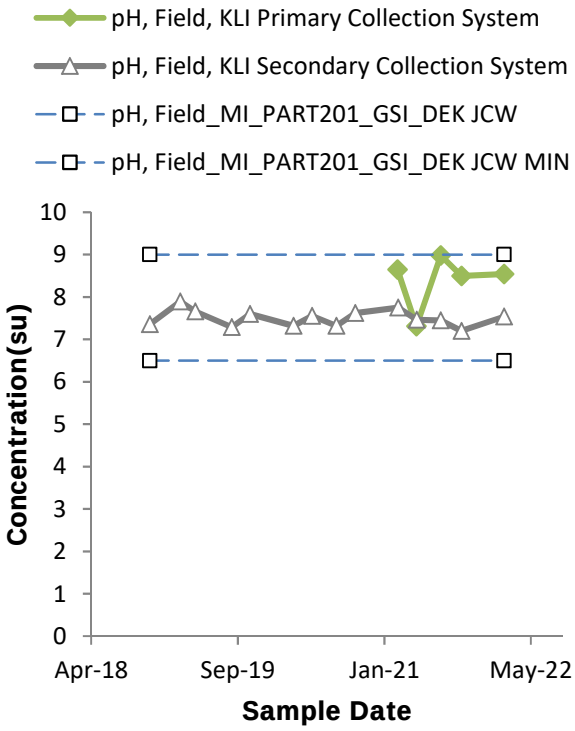


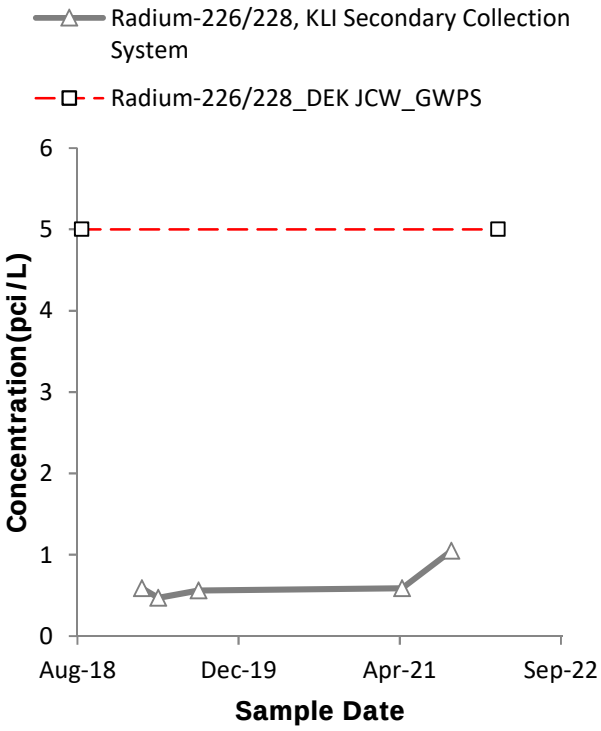


Water Quality Time Series

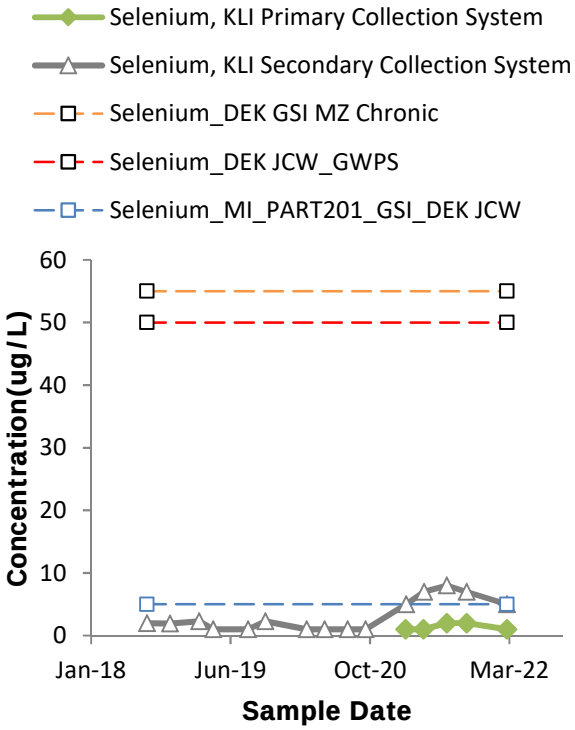


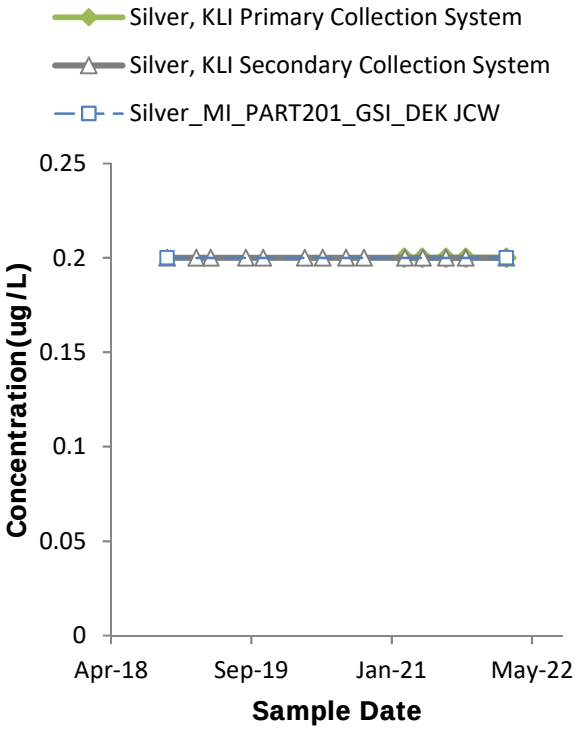


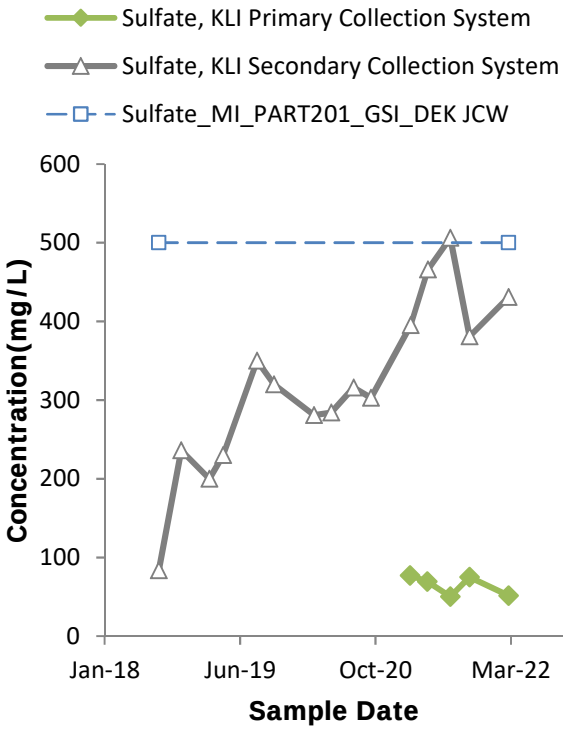


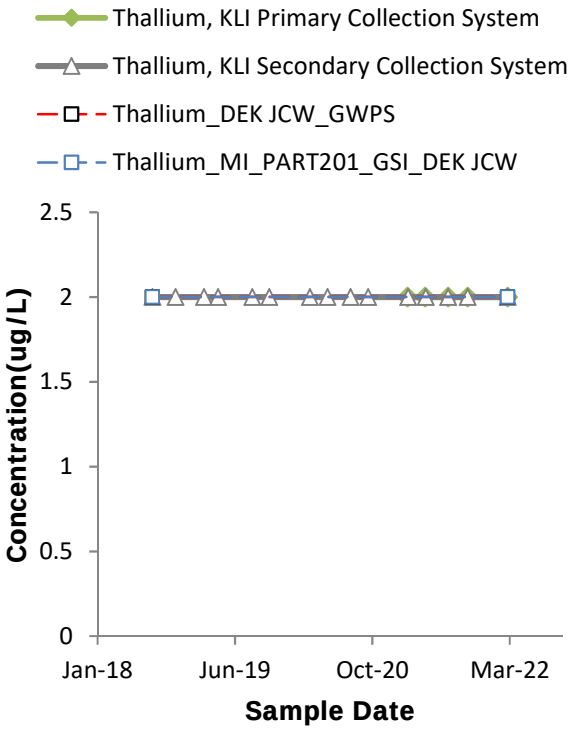


Water Quality Time Series

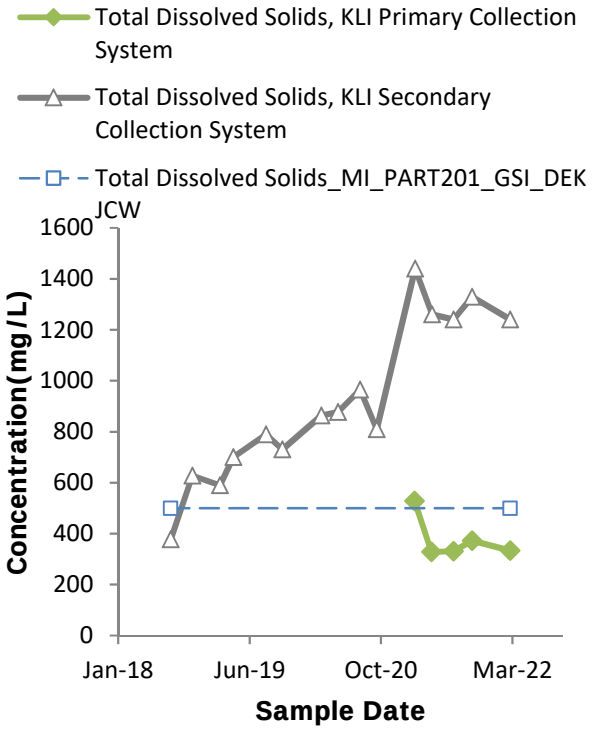


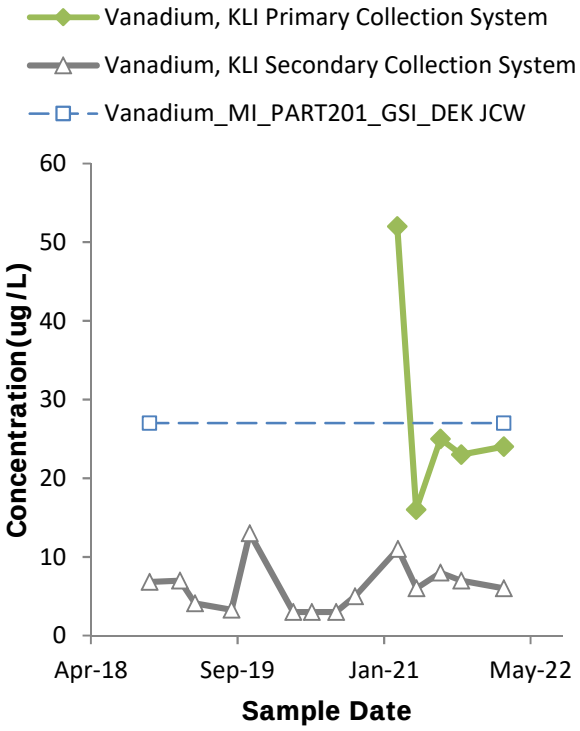


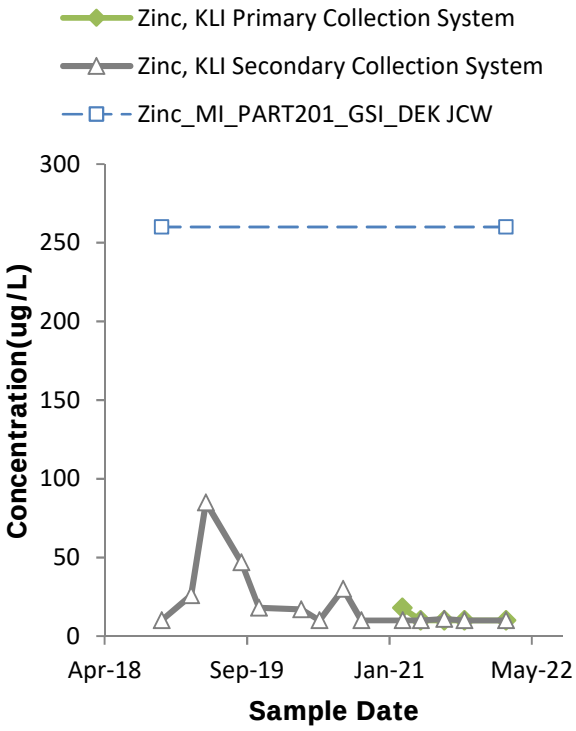




Water Quality Time Series







Appendix F
Alternate Source Demonstration

Consumers Energy
Count on Us®

A CMS Energy Company

Date: April 28, 2022

To: Operating Record

From: Harold D. Register, Jr., P.E. HDR

RE: Alternate Source Demonstration Professional Engineer Certification, §257.94(e)2
DE Karn Lined Impoundment CCR Unit

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

I hereby certify that the alternative source demonstration presented within this First Quarter 2022 Hydrogeological Monitoring Report for the DE Karn Lined Impoundment CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Harold D. Register Jr.
Signature

April 28, 2022
Date of Certification

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

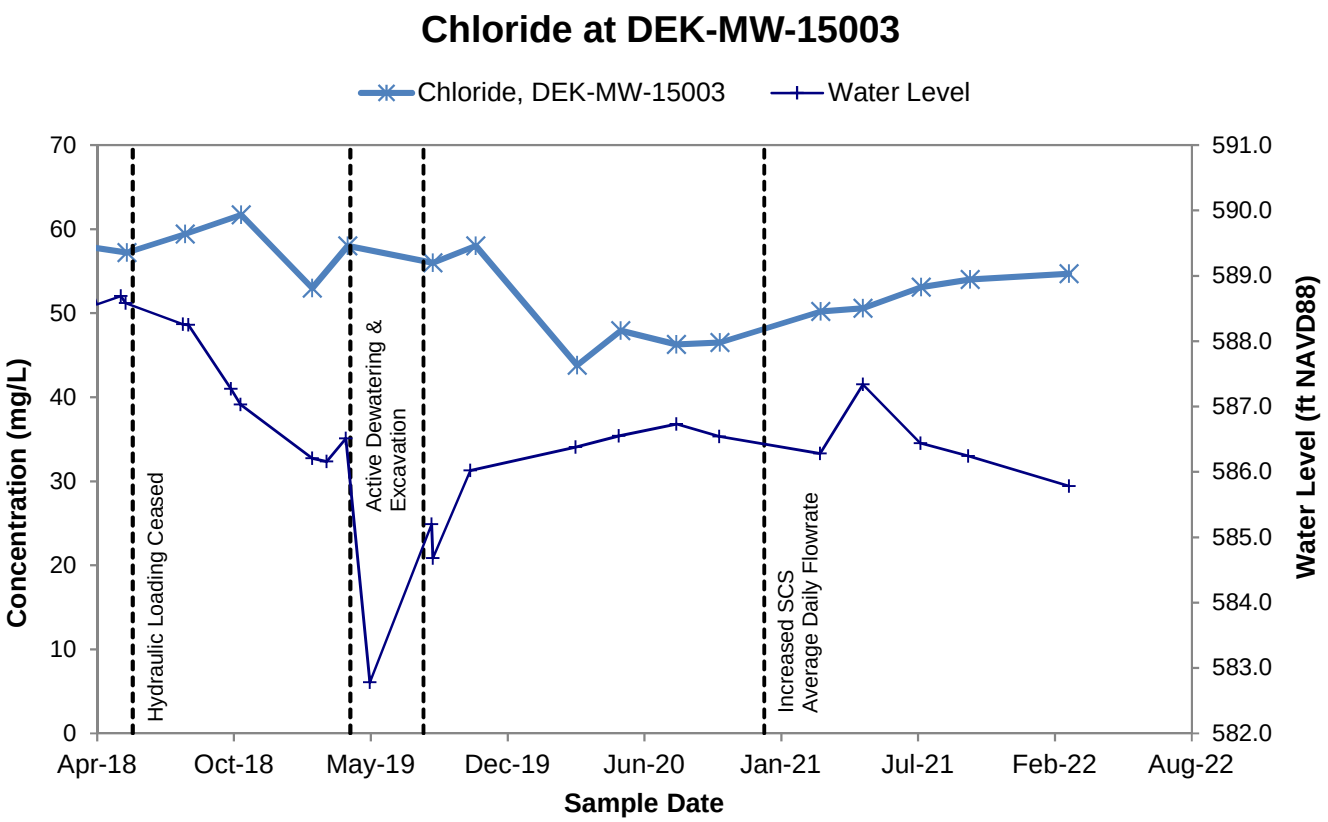
6201056266
Professional Engineer Certification Number

04/28/2022

References

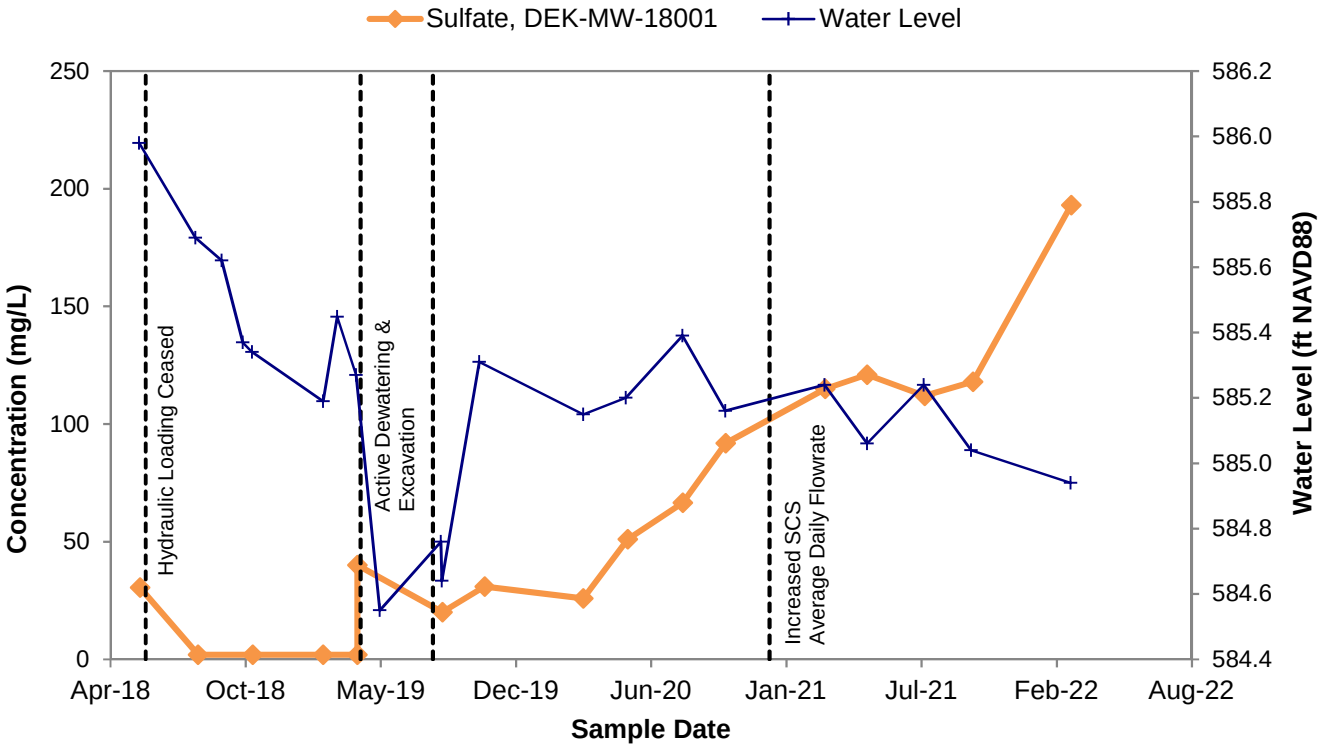
TRC (April 2022). *First Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan*

Alternate Source Demonstration Time Series

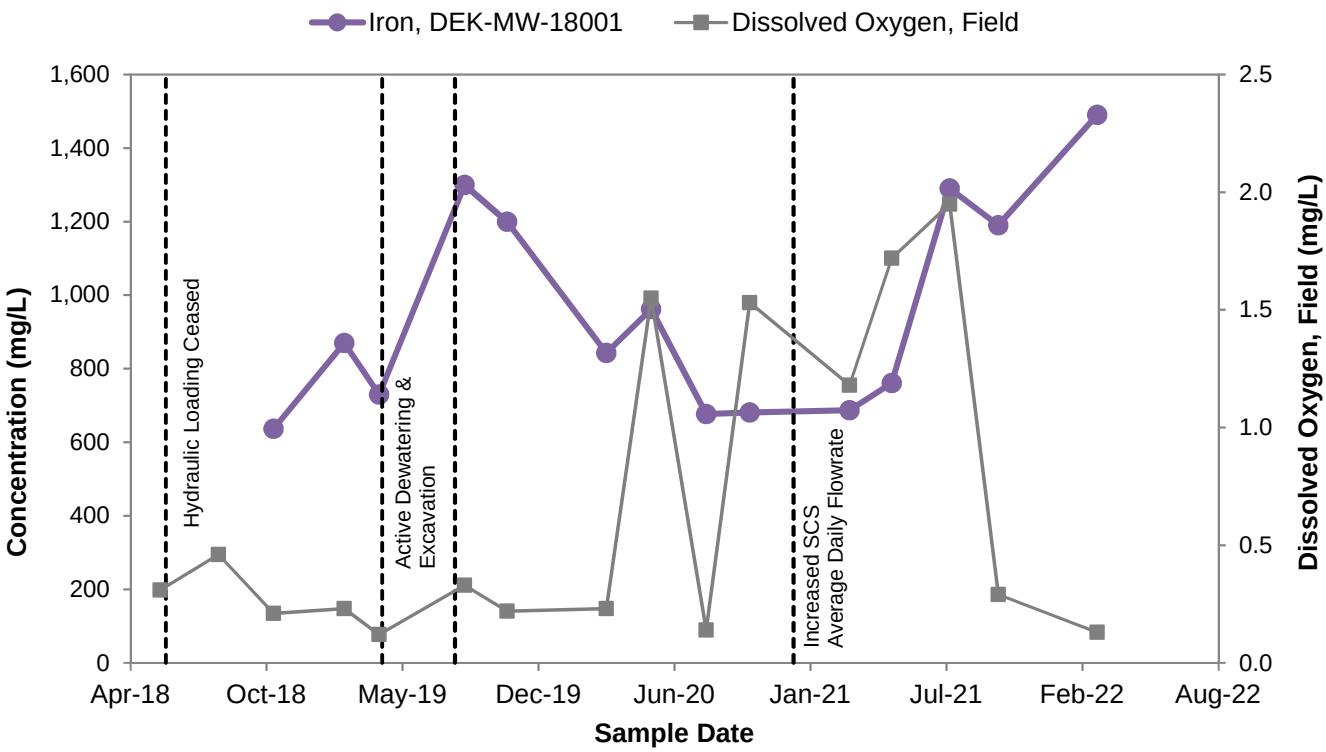


Alternate Source Demonstration Time Series

Sulfate at DEK-MW-18001



Iron at DEK-MW-18001



Second Quarter 2022 Hydrogeological Monitoring Report

DE Karn Lined Impoundment CCR Unit

Essexville, Michigan

July 2022

Prepared For:

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APPENDICES

1.0 Introduction

Pursuant to the Federal CCR Rule[1], Consumers Energy initiated a detection monitoring program for the Karn Lined Impoundment that went into service on June 7, 2018. After establishing the groundwater monitoring system and detection monitoring project pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) on December 28, 2018 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 amendments to the solid waste statute amended state groundwater monitoring requirements for coal ash impoundments; therefore, Consumers Energy submitted the *Karn Lined Impoundment Hydrogeological Monitoring Plan* (HMP) 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 November 13, 2020 and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9629 issued on December 10, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This Second Quarter 2022 Karn Lined Impoundment Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring requirements during the active life of the coal ash impoundment. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, *Format for Solid Waste Disposal Facility Monitoring Submittals*, dated July 5, 2013. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the facility's approved HMP that was approved by the EGLE on November 13, 2020. This HMP is compliant with the requirements set forth in Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Protection Act (NREPA), also known as Part 115 of PA 451 of 1994, as amended (Part 115) (a.k.a., Michigan Part 115 Solid Waste Management).

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the Second Quarter 2022 at the Karn Lined Impoundment located at 2742 Weadock Highway in Essexville, Michigan (Figure 1). Groundwater in the vicinity of the Karn Lined Impoundment has been documented to be affected by the management of CCR prior to the construction of the unit (January 2019, TRC). Given that the constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, the compliance monitoring program for the Karn Lined Impoundment consists of two parts to evaluate if there are new releases from the unit:

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

1. Monitoring of secondary collection system flow rates and water quality to detect leaks in the liner; and
2. Groundwater monitoring to determine if there are potential new releases from the Karn Lined Impoundment.

Based on sampling results for the second quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP.

1.3 Site Overview

The Karn Lined Impoundment is located within the DE Karn Power Plant site (Site) located north of the former JC Weadock Power Plant, east of the Saginaw River, south and west of Saginaw Bay (Figure 1). Two coal-fired power generating units (Karn Units 1 & 2) began generating electricity in 1958 and 1959, respectively. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled. Two other areas of coal ash management within the Karn site are the former Karn Bottom Ash Pond that was closed by removal and the Karn Landfill that was certified closed and now in post-closure care.

1.4 Geology/Hydrogeology

The majority of the Karn Lined Impoundment area is comprised of surficial CCR and sand fill, as described in the HMP. USGS topographic maps and aerial photographs dating back to 1938, in addition to field descriptions of subsurface soil at the site, indicate that the site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

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

The Site is bound by several surface water features (Figures 1 and 2): the Saginaw River to the west, Saginaw Bay (Lake Huron) to the north and east, and a discharge channel to the south. In general, shallow groundwater is encountered at a similar or slightly higher elevation relative to the surrounding surface water features. Groundwater flow in the upper aquifer is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay. In the vicinity of the Karn Lined Impoundment, the shallow groundwater flow is generally radial, with a potentiometric high point near the unlined ditch north of the Karn Lined Impoundment and near DEK-MW-15003, flowing outward toward the surrounding surface water bodies.

2.0 Second Collection System Monitoring

Consumers Energy initiated secondary collection system flow monitoring to comply with the EGLE-approved HMP in December 2020. The SCS serves as a leak detection system and the SCS flow rate data is used to demonstrate compliance with Part 115. Consumers Energy continues to comply with the requirements for unmonitorable units under Rule 437 of the Part 115 Rules.

The Average Daily Flow Rate for the period from December 10, 2020 – January 6, 2021 was calculated as 137.0 gallons per acre per day (GPAD), which exceeded the Response Action Flow Rate of 25 GPAD. Although this calculated flow rate does not constitute the average flow rate for the previous three months per the definition of average daily flow rate under Part 115, Consumers provided a proactive notification and a preliminary written assessment of the flow rate exceedances to the EGLE January 15, 2021 and January 22, 2021, respectively. The use of secondary collection system flow rates as a leak detection system was successful. Increased flow rates triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. Following repairs to the liner, Consumers Energy continues to monitor improvements in the secondary collection system for improvements in the Daily Average Flow Rate. The Average Daily Flow Rate for June 2022 and July 2022 was calculated as 20.4 and 20.1 gallons per acre per day (GPAD), respectively, and demonstrates that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021. Trends evaluated for weekly and monthly average flow rates do not indicate trends for either engineering or operational concerns and Consumers continues to document this information in their operating record.

In response to the prior exceedance of the SCS Response Action Flow Rate, samples were collected from the surface water of the primary collection system (KLI-PCS) and from the secondary leachate collection system sump (KLI-SCS) in May 2022 to compare leachate chemistry to groundwater chemistry. The samples were analyzed for the following constituents:

- Primary Indicator Parameters: Section 11511a(3)(c) - Detection Monitoring Constituents
- Alternative Indicator Parameters: Section 11519b(2) - Assessment Monitoring Constituents
- Optional Analyses in support of Piper or Stiff diagrams

The KLI-PCS and KLI-SCS data were evaluated for comparison to groundwater quality and water chemistry and to also assess potential of hazard and mobility of constituents. A series of time-series plots are included in Appendix E to illustrate water quality data changes over time for the secondary collection system from the start of operation in June 2018 to present. This analysis demonstrates that each monitored constituent is generally present at concentrations less than the Groundwater Protection Standard (GWPS) established under 40 CFR 257.95(h) or generic groundwater surface water interface (GSI) criteria adopted by the Department pursuant to Section 20120a, with the exception of total dissolved solids and chloride. A few notable observations:

- **Arsenic concentrations are higher in groundwater than the secondary collection system:** Arsenic was only detected in the secondary collection system at a concentration

of 1 ug/L, in May 2022. In contrast, the arsenic concentration observed in OW-12, the monitoring well located closest to the damaged liner areas, is 93 ug/L, which is consistent with concentrations observed in August 2020, before the liner damage occurred. Arsenic present in groundwater does not appear to be a result of a release from the unit.

- **Vanadium is detected in the primary and secondary collection system and not in groundwater**: Vanadium was present in the primary collection system sample at 24 ug/L in February 2022 and 11 ug/L in May 2022, which are higher than the vanadium concentrations in the secondary collection system (6 ug/L in February 2022 and 5 ug/L in May 2022). Vanadium was not detected in the wells nearest the observed liner damage: OW-12 (<2 ug/L) or DEK-MW-18001 (<2 ug/L) providing additional evidence that a release has not adversely affected groundwater conditions.
- **Secondary Collection System chemistry has not appreciably changed:** The time series plots in Appendix E show relatively stable trends in chemistry for samples collected from the primary collection system, with the exception of TDS and sulfate. In both cases the concentration in the primary collection system leachate is significantly lower in concentration than the concentration in the secondary collection system leachate, suggesting that the elevated TDS and sulfate is not likely from the primary collection system leachate. The TDS and sulfate concentrations in the secondary collection system are also more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products.

Water quality data collected for Second Quarter 2022 are included in the attached laboratory reports (Appendix A). Groundwater chemistry is discussed in Section 4.1. Groundwater conditions will continue to be monitored. Using the secondary collection system flow rates as a leak detection system was successful. The leak was identified in the fourth quarter of 2020, and actions were promptly taken to address the leak. In January 2021, liner damage was noted in two areas denoted as Visual Observation Point No. 1 (VOP 1) and Visual Observation Point No. 2 (VOP 2). VOP 2 was repaired on March 10, 2021 and VOP 1 was repaired on May 24, 2021 as documented by Golder Associates Inc. Consumers Energy submitted the repair certification reports to the EGLE on May 25, 2021 and June 29, 2021, respectively. The results of the mitigation efforts continue to be monitored and recent data demonstrate that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021.

Consumers Energy continues to monitor the secondary collection system flow rates, record flow rates and head level on the secondary liner in the operating record and evaluate flow rate trends on a weekly basis. Written notifications of flow rates in the secondary collection system will be provided monthly and evaluations of the chemical characteristics of liquid in the secondary collection system will be reported quarterly. In addition, Consumers Energy continues to provide quarterly updates on remedial actions performed on the leachate collection system through the quarterly groundwater monitoring report required by the HMP.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

In accordance with §257.91, Consumers Energy developed a groundwater monitoring system for the Karn Lined Impoundment prior to the initial receipt of waste in the CCR unit (TRC, 2018c). Given the radial groundwater flow direction and constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the Karn Bottom Ash Pond, the groundwater monitoring system design incorporates an intrawell statistical approach for detection monitoring as described in the HMP and in accordance with the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance" (USEPA, 2009). Five monitoring wells that are screened in the uppermost saturated unit were selected for the Karn Lined Impoundment HMP detection monitoring (DEK-MW-15003, DEK-MW-18001, OW-10, OW-11, and OW-12). Monitoring well locations are shown on Figure 2.

3.2 May 2022 Detection Monitoring Event

In accordance with the HMP, TRC conducted the second quarter 2022 monitoring event for the Karn Lined Impoundment on May 2nd and 3rd, 2022. In addition to the routine groundwater samples collected from the monitoring well network, a water sample was collected from a sump in the secondary collection system (KLI-SCS) and a surface water sample was collected from the primary collection system (KLI-PCS), as discussed in Section 2 above, such that leachate chemistry could be compared to groundwater chemistry. A sample of surface water was also collected from a ditch located north of the lined impoundment (SW-Ditch) to further evaluate site geochemistry (Figure 2). The SW-Ditch surface water grab sample represents water quality from the potentiometric high point adjacent to the Karn Lined Impoundment.

Groundwater samples collected during the May 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	Section 11519b(2) – Assessment Monitoring Constituents		
Boron	Antimony	Fluoride	Thallium
Calcium	Arsenic	Lead	Vanadium
Chloride	Barium	Lithium	Zinc
Fluoride	Beryllium	Mercury	
Iron	Cadmium	Molybdenum	Radium
pH	Chromium, total	Nickel	226 and 228
Sulfate	Cobalt	Selenium	
Total Dissolved Solids (TDS)	Copper	Silver	

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, and bicarbonate, carbonate, and total alkalinity to provide additional evaluation of groundwater chemistry. Analytical results from the second quarter 2022 monitoring event are included in the attached laboratory reports (Appendix A).

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

Monitoring wells were purged with peristaltic pumps utilizing low-flow sampling methodology. Field parameters were stabilized at each monitoring well prior to collecting groundwater samples. Stabilized field parameters for each monitoring well are summarized in Table 2. Field notes are included as Appendix B. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Porewater sample preparation and analyses were performed in accordance with SW-846 "Test Methods for Evaluation Solid Waste – Chemical / Physical Methods," USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of one field blank, one equipment blank, one field duplicate (DEK-MW-15003), and field matrix spike/matrix spike duplicate samples collected at DEK-MW-18001.

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the HMP program. The data quality reviews for the Karn Lined Impoundment network wells are summarized in Appendix C.

3.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the second quarter 2022 groundwater monitoring event are provided in Table 1. The data were used to construct the groundwater contour map (Figure 3).

Groundwater elevations measured at the site in May 2022 are generally within the range of 579 to 586 feet above mean sea level (ft NAVD88) and groundwater is typically encountered at equal elevation relative to the surrounding surface water features measured by the NOAA gauging station data or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although the point source discharge of sluiced bottom ash into the former Karn Bottom Ash Pond historically created localized mounding of the potentiometric surface, the new Karn Lined Impoundment went into service on June 7, 2018 and has been continuously collecting the process water and bottom ash that went into the former bottom ash pond. Since the former bottom ash pond is no longer being hydraulically loaded with sluiced ash and has been dewatered by gravity, the characteristic groundwater mound centered within the former surface pool area is no longer present. The groundwater elevation data collected in May 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to measurement taken in June 2018. Groundwater at the Site is locally influenced by incidental infiltration from precipitation over the uncovered acreage and the unlined low volume miscellaneous wastewater conveyance associated with the permitted NPDES discharge system, which is located just north of the Karn Lined Impoundment. Monitoring wells OW-11 and DEK-MW-15003 delineate the newly established groundwater elevation high point that was previously centered over the former Karn Bottom Ash Pond with porewater flow generally flowing radially towards the adjacent surface water features from this newly established potentiometric “high”, as illustrated in Figure 3.

The average hydraulic gradient observed on May 2, 2022 in the vicinity of the former Karn Bottom Ash Pond and Karn Lined Impoundment is estimated at 0.0050 ft/ft. The gradients were calculated using the monitoring well pairs DEK-MW-15004/DEK-MW-15005, DEK-MW-15003/DEK-MW-15006, and OW-11/MW-08, as well as the monitoring well water elevation difference and distance between DEK-MW-18001 and the discharge channel. The discharge channel surface water elevation was taken from the NOAA gauging station data on the same date as the water level measurements. Using the mean hydraulic conductivity of 15 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.3, the estimated average seepage velocity was calculated to be 0.25 ft/day or 91 ft/year in May 2022 which is reduced relative to previous estimated seepage velocities (e.g., 0.33 ft/day or 120 ft/year August 2018).

Due to the operational changes of the former bottom ash pond and the completion of the landfill capping activities in 2020, the gradient between the area of the Karn Bottom Ash Pond and Karn Lined Impoundment and the surrounding surface water bodies is flattening out as compared to previous quarters and is also attempting to reach a new equilibrium, as expected. The general flow direction relative to the Karn Lined Impoundment is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III/IV parameters that could potentially migrate from the Karn Lined Impoundment.

4.0 Data Evaluation

Based on sampling results for the second quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP. The following section summarizes the statistical approach applied to assess the second quarter 2022 groundwater data in accordance with the detection monitoring program.

Water quality data are included in the attached laboratory reports (Appendix A). Groundwater analytical data for the most recent quarterly monitoring event is summarized in Table 3 along with the associated Part 201 generic drinking water criteria, the generic GSI criteria, and the site-specific mixing-zone GSI criteria. Mixing-zone criteria are provided for the Karn-Weadock complex in the December 23, 2015 mixing zone determination that consists of arsenic, boron, and selenium. As such, arsenic, boron, and selenium are compared to site-specific mixing zone-based GSI criteria, and all other constituents are screened against generic GSI criteria. GSI compliance is evaluated through monitoring performed at the Karn Landfill in accordance with the EGLE-approved Consumers Energy's revised Karn Landfill HMP (Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area) dated December 19, 2017.

4.1 Statistical Evaluation of Trends

Groundwater in the vicinity of the Karn Lined Impoundment has been affected by CCR management before commencement of operation (January 2019, TRC). Given that the constituents associated with CCR currently managed in the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, intrawell trend tests, in conjunction with KLI-SCS flow rates, will be utilized to assess whether a release has occurred from operation of the unit. The detection monitoring constituent concentrations will be analyzed using Mann-Kendall and Sen's Slope trend tests to determine if there is an upward trend that may indicate a release from the Karn Lined Impoundment. The data will be analyzed in the context of the Site hydrogeologic characteristics and an assessment made as to whether the source of an upward trend, if identified, is from a possible release from the Karn Lined Impoundment, another on-site release, or on-site migration of nearby impact (i.e., former Karn Bottom Ash Pond).

Time-series plots and statistical trend analyses are used to evaluate groundwater quality each quarter, which are included as Appendix D. Consumers Energy manages and evaluates its analytical data using Sanitas™ Statistical Software (Sanitas™). Consumers Energy conducts intra-well trend analyses to examine data for each monitoring well-constituent pair in the groundwater monitoring system over time to determine if changes in water quality are occurring that may be associated with the Karn Lined Impoundment. Data from August 2020 through May 2022 were analyzed using Mann-Kendall and Sen's Slope at a significance level (α) of 0.025 per tail for each constituent/sampling point dataset to assess trends. Sen's Slope estimator was used to assess the magnitude of the slope and the Mann-Kendall test was used to determine if the slope was statistically significant. The graphical output of the Sen's Slope/Mann-Kendall trend tests and time series are presented in Appendix D. Appendix D also includes a table summarizing these trends and the associated statistical trend charts.

Data trends for detection monitoring constituents are generally stable (i.e., no trend) or declining for the majority of the monitoring well/constituent pairs with the following exceptions:

- The increasing trend in chloride concentrations in monitoring well DEK-MW-15003 was confirmed in Q1 2022 and continued to be observed in Q2 2022.
- A new, unconfirmed trend in chloride concentrations was observed in monitoring well OW-12.
- An increasing trend in sulfate concentrations continued to be observed in monitoring well DEK-MW-18001.
- The increasing trend in iron concentrations first observed in monitoring well DEK-MW-18001 in Q1 2022 was confirmed in Q2 2022.
- Continuous increasing trends were observed for boron and pH in monitoring well OW-11.

4.2 Detection Monitoring Data Discussion

Groundwater quality is generally consistent with previous monitoring events and the majority of the well/constituent pairs are exhibiting no trend or decreasing concentrations. Although increasing trends of detection monitoring (Appendix III) constituents exist, the groundwater conditions do not conclusively indicate a release from the unit, as discussed further in Section 4.3. The location of one of the identified liner damage locations was approximately 40-ft upgradient from monitoring well OW-12 and the second location was approximately 130-ft upgradient from monitoring well DEK-MW-18001. Both leaks have been repaired. Detection monitoring constituent concentrations at OW-12, located closest to the identified liner damage, exhibit no statistically significant increasing trends, indicating that if a release to groundwater occurred due to the apparent leak in the liner system, the effects on local groundwater quality at this point appear to be negligible. The increasing trends at noted in section 4.1 will continue to be evaluated within context of changes in the site operational status.

4.3 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed in the First Quarter 2022 Hydrogeological Monitoring Report (TRC, April 2022):

- Sulfate and iron in monitoring well DEK-MW-18001;
- Boron and pH in monitoring well OW-11; and
- Chloride in monitoring well DEK-MW-15003.

Although increasing trends of detection monitoring (Appendix III) constituents exist, as noted in Section 4.1, the groundwater conditions do not conclusively indicate a release from the unit for several reasons as detailed below.

Timing of Changes in Concentrations

Time-series plots included in Appendix F illustrate that the change in sulfate and iron at DEK-MW-18001 and chloride at DEK-MW-15003 are likely a result of changes in the groundwater flow regime or redox conditions as a result of the Bottom Ash Pond closure activities, rather

than a result of a release from the unit.

- The increasing concentrations of sulfate (DEK-MW-18001) began around the time of the dewatering and excavation that occurred in the adjacent Bottom Ash Pond area (April through July 2019), well before a leak in the Karn Lined Impoundment liner system was noted through the increase in the SCS daily average flow rate observed in December 2020; therefore, the recent increase in concentrations is not due to a release from the unit.
- Chloride at DEK-MW-15003 initially decreased after the Bottom Ash Pond closure activities. In early 2020, chloride concentrations began to increase and appear to be approaching the concentrations observed pre-construction. The slight increase in chloride began before the noted leak in the Karn Lined Impoundment liner system was observed; therefore, the recent increase in concentrations is not due to a release from the unit.
- Concentrations of iron observed in monitoring well DEK-MW-18001 are likely affected by both the increases in sulfate concentrations as well as changes in dissolved oxygen, rather than a release from the unit.
  - Iron concentrations initially decreased following the pond decommissioning activities and have more recently increased. Sulfate concentrations at DEK-MW-18001 were quite low prior to the Bottom Ash Pond closure activities. When appreciable amounts of sulfide are present (such as from a reduction of sulfate), iron concentrations can be reduced due to the precipitation of iron sulfides. If the amount of sulfide is reduced, such as if less sulfate is being converted to sulfide, this could result in increased iron concentrations.
  - When dissolved oxygen is greater than 1-2 mg/L, iron concentrations may be reduced, as iron occurs as Fe^{3+}, which is less soluble than Fe^{2+}. Conversely, decreases in dissolved oxygen, such as what was observed in October 2021 and February 2022 results in increased iron concentrations.

Groundwater Flow Direction

OW-11 and DEK-MW-15003 are not located downgradient of either area of the noted liner damage, due to the position of the wells relative to the groundwater elevation high point, as shown in Figure 3. Furthermore, OW-11 has distinct chemistry as compared to the KLI-SCS data as shown in Table 3. Boron, which can be used as a conservative tracer, is nearly six times higher in OW-11 than what has been observed in the KLI-SCS samples. The pH observed at OW-11 is 2 standard units higher than what is observed in the KLI-SCS sample and other nearby wells, which indicate a source other than the Karn Lined Impoundment is influencing chemistry at OW-11.

Leachate Chemistry

Analysis of the KLI-PCS and KLI-SCS data provide additional lines of evidence to support a source other than the unit is contributing to groundwater conditions.

- Arsenic concentrations are higher in groundwater than in the secondary collection system; therefore, arsenic present in groundwater does not appear to be a result of a release from the unit (Section 2.0).
- Vanadium is detected in the primary and secondary collection system and not in groundwater in the wells nearest the observed liner damage OW-12 or DEK-MW-18001 (<2

ug/L), providing additional evidence that a release has not adversely affected groundwater conditions.

- As discussed in Section 2.0, the sulfate in the primary collection system leachate is significantly lower in concentration than in the secondary collection system leachate, suggesting that the elevated sulfate is more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products. Sulfate concentrations in groundwater are more similar to the secondary collection system leachate concentrations than the primary collection system leachate, indicating that the source of sulfate is related to regional groundwater conditions rather than the waste managed in the unit.
- A confirmed increasing trend of iron has been observed at DEK-MW-18001; however, iron concentrations in the groundwater are higher than in the secondary collection system; therefore, iron present in groundwater does not appear to be a result of a release from the unit.

5.0 Conclusions and Recommendations

Consumers Energy will continue the detection monitoring program for the Karn Lined Impoundment unit based on the data evaluations completed in Section 4.0 of this report in conformance with the Karn Lined Impoundment HMP. Although increasing trends for detection monitoring constituents were observed in three wells in 2Q 2022, these trends were found to not be a result of operation of the Karn Lined Impoundment. No SSIs over background limits were identified at the Karn Lined Impoundment during the May 2022 monitoring event. The use of secondary collection system flow rates as a leak detection system was successful. Increased flow rates observed in Q4 2020 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. The results of the mitigation efforts continue to be monitored and recent data demonstrate that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021. The third quarter monitoring event is scheduled for July 2022.

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Tables

Table 1
Summary of Groundwater Elevation Data
DE Karn – RCRA CCR Monitoring Program
Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)	May 2, 2022	
				Depth to Water (ft BTOC)	Groundwater Elevation (ft)
DEK Bottom Ash Pond					
DEK-MW-15002	590.87	Sand	578.3 to 575.3	6.50	584.37
DEK-MW-15005	589.72	Sand	572.3 to 567.3	9.64	580.08
DEK-MW-15006	589.24	Sand	573.0 to 568.0	9.12	580.12
DEK Bottom Ash Pond & Karn Lined Impoundment					
DEK-MW-18001	593.47	Sand	579.2 to 574.2	8.10	585.37
Karn Lined Impoundment					
DEK-MW-15003	602.74	Sand	578.8 to 574.8	16.80	585.94
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	6.43	585.15
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	22.06	585.84
OW-12	603.10	Silty Sand	584.2 to 579.2	17.05	586.05
DEK Nature and Extent					
DEK-MW-15004	611.04	Sand	576.6 to 571.6	28.22	582.82
MW-01	597.02	Sand	573.0 to 570.0	17.08	579.94
MW-03	597.30	Sand	569.8 to 566.8	17.37	579.93
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	9.26	580.18
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	17.79	580.99
MW-10	596.97	Sand	582.5 to 572.5	16.90	580.07
MW-12	598.60	Sand	583.9 to 573.9	18.61	579.99
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	14.43	579.94
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	15.84	579.96
MW-22	598.99	Ash/Sand	571.4 to 568.4	16.78	582.21
MW-23	595.57	Ash/Sand	576.9 to 571.9	13.92	581.65
DEK Static Water Level					
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	17.38	579.96
MW-04	598.01	NR	569.5 to 564.5	18.17	579.84
MW-17	597.91	Sand	577.0 to 574.0	12.91	585.00
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	25.86	583.36
MW-19	597.28	NR	572.1 to 567.1	16.90	580.38
MW-20	632.75	Sand	582.3 to 579.3	52.70	580.05
MW-21	632.91	Sand	587.1 to 584.1	51.20	581.71
OW-01	631.33	NR	572.5 to 567.5	51.22	580.11
OW-02	598.01	Fly Ash	579.4 to 576.4	15.55	582.46
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	17.53	580.41
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	10.25	579.96
OW-05	593.53	Sand	576.9 to 571.9	13.49	580.04
OW-06	603.95	NR	580.9 to 575.9	22.00	581.95
OW-07	596.41	Ash	583.3 to 580.3	14.84	581.57
OW-08	593.93	NR	581.0 to 576.0	10.78	583.15
OW-09	593.45	NR	585.5 to 580.5	10.25	583.20
OW-13	588.52	NR	579.5 to 574.5	4.08	584.44
OW-15	587.75	NR	572.8 to 567.8	4.40	583.35

Notes:

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

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

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

NR: Not Recorded

Table 2
Summary of Field Parameters: May 2022
Second Quarter 2022 Quarterly Report
Karn Lined Impoundment - Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Karn Lined Impoundment							
DEK-MW-15003	5/3/2022	0.15	-198.2	7.9	379	15.6	2.2
DEK-MW-18001	5/3/2022	--	-76.3	7.6	983	9.6	4.9
KLI-PCS	5/3/2022	10.37	90.4	8.1	445	10.9	5.1
KLI-SCS	5/3/2022	3.10	70.6	7.1	1,507	11.3	0.7
OW-10	5/3/2022	0.17	-154.6	7.1	676	9.9	83.8
OW-11	5/3/2022	0.64	-27.3	9.5	323	11.4	7.4
OW-12	5/3/2022	0.21	-151.7	7.1	777	11.9	8.1
SW-DITCH	5/3/2022	8.74	38.0	8.7	492	15.6	14.7

Notes:
mg/L - Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit.
-- = Parameter Not Measured

Table 3
Summary of Groundwater Sampling Results (Analytical): May 2022
Second Quarter 2022
Karn Lined Impoundment – Essexville, Michigan

					Sample Location:	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**	**KLI-SCS**	**KLI-PCS**	**SW-DITCH**
					Sample Date:	5/3/2022	5/3/2022	5/3/2022	5/3/2022	5/3/2022	5/3/2022	5/3/2022	5/3/2022
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	upgradient	downgradient		upgradient	downgradient	Supplemental		
Appendix III[(1)]													
Boron	ug/L	NC	**500**	**500**	4,000	**760**	**869**	**1,180**	**3,370**	**917**	**610**	**781**	85
Calcium	mg/L	NC	NC	NC	500[EE]	30	63.7	98.3	8.26	90.3	98.1	56.6	55.2
Chloride	mg/L	250**	250[E]	250[E]	**50**	**57**	**65.9**	**68.7**	**61.3**	**64.9**	**50.8**	**51.6**	46.5
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	2,790	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	500[EE]	41.2	187	2.32	20.7	206	**443**	77.7	26.2
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	275	**555**	**545**	229	**663**	**1,320**	342	346
pH, Field	SU	**6.5 - 8.5****	**6.5 - 8.5[E]**	**6.5 - 8.5[E]**	**6.5 - 9.0**	7.9	7.6	7.1	**9.5**	7.1	7.1	8.1	**8.7**
Appendix IV[(1)]													
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	2	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	**349**	**113**	2	**671**	**93**	1	< 1	2
Barium	ug/L	2,000	2,000	2,000	1,200	44	164	136	27	98	58	361	170
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	2	< 1	< 1	< 1	4	2
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	2,790	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	21	22	30	< 10	35	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	**73**	210	**120**	21	< 5	< 5	**197**	14	12	27	5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.417	0.294	< 0.530	< 0.387	< 0.337	< 0.440	--	--
Radium-228	pCi/L	NC	NC	NC	NC	0.694	0.592	< 0.632	< 0.525	< 0.440	< 0.492	--	--
Radium-226/228	pCi/L	5	NC	NC	NC	0.799	0.885	< 0.632	< 0.525	0.620	< 0.492	--	--
Selenium	ug/L	50	50	50	5.0	1	2	2	3	1	5	2	< 1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]													
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	130	**1,360**	**4,140**	45	**5,790**	85	136	**606**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	< 1	< 1	2	2	1	3	2	7
Nickel	ug/L	NC	100	100	120	< 2	3	4	2	4	7	3	3
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	**4.5**	**62**	**27**	< 2	< 2	3	**660**	< 2	**5**	**11**	4
Zinc	ug/L	5,000**	2,400	5,000[E]	260	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

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

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

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

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.

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

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

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

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

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

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

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

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

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Statistical Exceedances – May 2022
Karn Lined Impoundment
Essexville, Michigan

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

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

Facility: Karn Lined Impoundment – WDS# 392503

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	2 Qtr. 2022 (**bold** >201)	1 Qtr. 2022 (**bold** >201)	4 Qtr. 2021 (**bold** >201)	3 Qtr. 2021 (**bold** >201)

No Exceedances

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
TRC - GIS

PROJECT:

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

TITLE:

SITE LOCATION MAP

DRAWN BY:	A. ADAIR
CHECKED BY:	J. KRENZ
APPROVED BY:	D. LITZ
DATE:	JULY 2022
PROJ. NO.:	464095.0001
FILE:	464095-501-001.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\1_DEKARN\2022_MXDs\MAY_2022\464095-501-001.mxd -- Saved By: AADAIR on 5/25/2022, 14:59:17 PM

LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SECONDARY CONTAINMENT SUMP (KLI-SCS)
- PRIMARY CONTAINMENT SYSTEM SAMPLE (KLI-PCS)
- SURFACE WATER SAMPLE (SW-DITCH)
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02, MW-03/MW-04, OW-02/MW-22, AND OW-07/MW-23 AS THE WELLS ARE LOCATED WITHIN 15-FT OF EACH OTHER.

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:

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

TITLE:

SITE LAYOUT MAP

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 2**
DATE:	JULY 2022		

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

FILE NO.: 464095-001-002.mxd

Plot Date: 7/12/2022, 10:04:00 AM by AADAIR – LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 26976\11 DEKARN\2022 MXDs\MAY 2022\464095-001-002.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)
- *(580.50)* GROUNDWATER ELEVATION (FEET)
- *(NU)* NOT USED

NOTES

1. BASE MAP IMAGERY FROM GOOGLE EARTH PRO, 2018.
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

0 600 1,200 Feet

1 " = 600 '
1:7,200

N

PROJECT:
CONSUMERS ENERGY COMPANY
DE KARN POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE:
SHALLOW GROUNDWATER CONTOUR MAP MAY 2022

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 3**
DATE:	JULY 2022		

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

FILE NO.: 464095-501-003.mxd

Plot Date: 7/21/2022, 08:16:48 AM by AADAIR -- LAYOUT: ANSI B (11"x17")
Path: S:\11-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 26976711 DEKARN\2022 MXDs\MAY 2022\464095-501-003.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

Appendix A
Laboratory Analytical Reports

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 22, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN LINED IMPOUNDMENT – 2022 Q2

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0438

TRC Environmental, Inc. conducted groundwater monitoring at the DE Karn Lined Impoundment area on 05/03/2022 for the 2nd Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 05/04/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions, with the exception of one container noted below and in 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.

NOTE: Container "22-0438-08-C09 / DUP-KLI" for Dissolved Organic Carbon was received broken.

II. Methodology

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

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q2-2022 DEK Lined Impoundment
Date Received: 5/4/2022
Chemistry Project: 22-0438

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0438-01	DEK-MW-15003	Groundwater	05/03/2022 10:52 AM	DEK Lined Impoundment
22-0438-02	OW-10	Groundwater	05/03/2022 02:25 PM	DEK Lined Impoundment
22-0438-03	OW-11	Groundwater	05/03/2022 09:27 AM	DEK Lined Impoundment
22-0438-04	OW-12	Groundwater	05/03/2022 12:42 PM	DEK Lined Impoundment
22-0438-05	KLI-SCS	Groundwater	05/03/2022 07:59 AM	DEK Lined Impoundment
22-0438-06	KLI-PCS	Surface Water	05/03/2022 07:35 AM	DEK Lined Impoundment
22-0438-07	SW-DITCH	Surface Water	05/03/2022 08:25 AM	DEK Lined Impoundment
22-0438-08	DUP-KLI	Groundwater	05/03/2022 12:00 AM	DEK Lined Impoundment
22-0438-09	EB-KLI	Water	05/03/2022 01:05 PM	DEK Lined Impoundment
22-0438-10	FB-KLI	Water	05/03/2022 12:42 PM	DEK Lined Impoundment

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-0438-01
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 10:52 AM

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

Aliquot #: 22-0438-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	349		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	44		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	760		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	30000		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	130		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	21		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	5490		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	63		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	21		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	4360		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	1		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	50800		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-01-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0438-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	57000		ug/L	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-0438-01
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 10:52 AM

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

Aliquot #: 22-0438-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	41200		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-01-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2120		ug/L	25.0	05/09/2022	AB22-0509-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-01-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	275		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	109000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	109000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3800		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4500		ug/L	1000.0	05/11/2022	AB22-0519-11

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0438-02
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 02:25 PM

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

Aliquot #: 22-0438-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	2		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	136		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	1180		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	98300		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	2		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	2		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	4140		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	30		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	18800		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	474		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	4		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	5280		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	2		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	67900		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	3		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-02-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0438-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	68700		ug/L	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0438-02
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 02:25 PM

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

Aliquot #: 22-0438-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	2320		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-02-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	4360		ug/L	25.0	05/09/2022	AB22-0509-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-02-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	545		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	409000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	409000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	9000		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	10000		ug/L	1000.0	05/11/2022	AB22-0519-11

Metals by EPA 6020B: CCR Rule Appendix III-IV Diss Metals Expa

Aliquot #: 22-0438-02-C10-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/17/2022	AB22-0516-05
Arsenic	2		ug/L	1.0	05/17/2022	AB22-0516-05
Barium	121		ug/L	5.0	05/17/2022	AB22-0516-05
Beryllium	ND		ug/L	1.0	05/17/2022	AB22-0516-05
Boron	1310		ug/L	20.0	05/16/2022	AB22-0516-05

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0438-02
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 02:25 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Diss Metals Expa

Aliquot #: 22-0438-02-C10-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Cadmium	ND		ug/L	0.2	05/17/2022	AB22-0516-05
Calcium	101000		ug/L	1000.0	05/16/2022	AB22-0516-05
Chromium	4		ug/L	1.0	05/17/2022	AB22-0516-05
Cobalt	ND		ug/L	6.0	05/17/2022	AB22-0516-05
Copper	ND		ug/L	1.0	05/17/2022	AB22-0516-05
Iron	3790		ug/L	20.0	05/16/2022	AB22-0516-05
Lead	ND		ug/L	1.0	05/17/2022	AB22-0516-05
Lithium	28		ug/L	10.0	05/17/2022	AB22-0516-05
Magnesium	19000		ug/L	1000.0	05/16/2022	AB22-0516-05
Manganese	493		ug/L	5.0	05/16/2022	AB22-0516-05
Molybdenum	ND		ug/L	5.0	05/17/2022	AB22-0516-05
Nickel	7		ug/L	2.0	05/17/2022	AB22-0516-05
Potassium	5170		ug/L	100.0	05/16/2022	AB22-0516-05
Selenium	2		ug/L	1.0	05/17/2022	AB22-0516-05
Silver	ND		ug/L	0.2	05/17/2022	AB22-0516-05
Sodium	69800		ug/L	1000.0	05/16/2022	AB22-0516-05
Thallium	ND		ug/L	2.0	05/17/2022	AB22-0516-05
Vanadium	2		ug/L	2.0	05/17/2022	AB22-0516-05
Zinc	ND		ug/L	10.0	05/17/2022	AB22-0516-05

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-0438-03
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 09:27 AM

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

Aliquot #: 22-0438-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	2		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	671		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	27		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	3370		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	8260		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	2		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	45		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	1200		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	197		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	2		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	4730		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	3		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	63400		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	660		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-03-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0438-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	61300		ug/L	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-0438-03
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 09:27 AM

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

Aliquot #: 22-0438-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	2790		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	20700		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-03-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	12000		ug/L	25.0	05/09/2022	AB22-0509-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-03-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	229		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	87300		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	23000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	64300		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	6500		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	8100		ug/L	1000.0	05/11/2022	AB22-0519-11

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-0438-04
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 12:42 PM

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

Aliquot #: 22-0438-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	93		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	98		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	917		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	90300		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	1		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	5790		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	35		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	32600		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	194		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	14		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	4		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	6250		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	1		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	67100		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-04-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-04-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0438-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	64900		ug/L	1000.0	05/06/2022	AB22-0505-07

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-0438-04
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 12:42 PM

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

Aliquot #: 22-0438-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	206000		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-04-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	742		ug/L	25.0	05/09/2022	AB22-0509-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-04-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	663		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-04-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	228000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	228000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-04-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-04-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2300		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-04-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4700		ug/L	1000.0	05/11/2022	AB22-0519-11

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-0438-05
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 07:59 AM

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

Aliquot #: 22-0438-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	1		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	58		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	610		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	98100		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	3		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	85		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	36600		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	12		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	7		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	3340		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	5		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	307000		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	5		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-05-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-05-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1640		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0438-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	50800		ug/L	1000.0	05/06/2022	AB22-0505-07

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-0438-05
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 07:59 AM

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

Aliquot #: 22-0438-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	443000		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-05-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	05/09/2022	AB22-0509-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-05-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1320		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-05-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	547000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	547000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-05-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-05-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3800		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-05-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4900		ug/L	1000.0	05/11/2022	AB22-0519-11

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-0438-06
Matrix: Surface Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 07:35 AM

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

Aliquot #: 22-0438-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	361		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	781		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	56600		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	4		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	2		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	136		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	15900		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	27		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	3		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	3330		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	2		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	36500		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	11		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-06-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-06-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1170		ug/L	100.0	05/05/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/05/2022	AB22-0504-08

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

Aliquot #: 22-0438-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	51600		ug/L	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-0438-06
Matrix: Surface Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 07:35 AM

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

Aliquot #: 22-0438-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/05/2022	AB22-0505-07
Sulfate	77700		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-06-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	05/10/2022	AB22-0510-14

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-06-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	342		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-06-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	130000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	127000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-06-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-06-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2500		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-06-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	3300		ug/L	1000.0	05/11/2022	AB22-0519-11

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-0438-07
Matrix: Surface Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 08:25 AM

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

Aliquot #: 22-0438-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	2		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	170		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	85		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	55200		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	2		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	7		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	606		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	18500		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	33		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	5		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	3		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	2730		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	38700		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	4		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-07-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-07-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1020		ug/L	100.0	05/05/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/05/2022	AB22-0504-08

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

Aliquot #: 22-0438-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	46500		ug/L	1000.0	05/06/2022	AB22-0505-07

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-0438-07
Matrix: Surface Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 08:25 AM

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

Aliquot #: 22-0438-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/05/2022	AB22-0505-07
Sulfate	26200		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-07-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	168		ug/L	25.0	05/10/2022	AB22-0510-14

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-07-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	346		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-07-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	202000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	187000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	15300		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-07-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-07-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	7000		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-07-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	9100		ug/L	1000.0	05/11/2022	AB22-0519-11

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-0438-08
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-0438-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	344		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	45		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	791		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	30500		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	119		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	22		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	5700		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	65		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	22		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	4700		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	51400		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-08-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-08-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/05/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/05/2022	AB22-0504-08

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

Aliquot #: 22-0438-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	51600		ug/L	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-0438-08
Matrix: Groundwater

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-0438-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/05/2022	AB22-0505-07
Sulfate	37700		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-08-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	1930		ug/L	25.0	05/10/2022	AB22-0510-14

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0438-08-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	270		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0438-08-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	76600		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	76600		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-08-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-08-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3800		ug/L	1000.0	05/11/2022	AB22-0519-10

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-0438-09
Matrix: Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 01:05 PM

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

Aliquot #: 22-0438-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	ND		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	ND		ug/L	20.0	05/10/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	ND		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-09-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-09-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/05/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/05/2022	AB22-0504-08

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-09-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	05/10/2022	AB22-0510-14

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-0438-09
Matrix: Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 01:05 PM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-09-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-09-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-09-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-11

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-0438-10
Matrix: Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 12:42 PM

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

Aliquot #: 22-0438-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	ND		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	ND		ug/L	20.0	05/10/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	ND		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0438-10-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0438-10-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/05/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/05/2022	AB22-0504-08

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0438-10-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	05/10/2022	AB22-0510-14

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-0438-10
Matrix: Water

Laboratory Project: **22-0438**
Collect Date: 05/03/2022
Collect Time: 12:42 PM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0438-10-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-16

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-10-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-10

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0438-10-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-11

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0438

Inspection Date: 05/04/22 **Inspection By:** CMT

Sample Origin/Project Name: DEK LI

Shipment Delivered By: Enter the type of shipment carrier.

Pony ____ FedEx ✓ UPS ____ USPS ____ Airborne ____

Other/Hand Carry (whom) ____

Tracking Number: 772724708332 Shipping Form Attached: Yes ✓ No ____

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

Cooler 61 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 0.4-3.8°C Samples Received on Ice: Yes X No ____

#015402 | 4.3.22

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	40=19				
Quart/Liter (g/p)	60=16				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	41				
24 mL vial (glass)					
250 ~~500~~ mL (plastic)	8				
Other					

PH Paper 0-14

IH# 22420

EXP: 8.1.23

PG. 1 of 2

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Container Damage List or Exception Report (required if leaking, damaged or exception containers are found)

Project Log-In Number: 22-0438

Inspection Date: 05/04/22 **Inspection By:** CH

Sample Container Damage Listing: List all sample containers that were found to be broken, leaking, missing sample labels or are not accounted for on the CoC.

Sample/Container ID	Damage/Exception Report
22-0438-08-C09	40mL vial received broken.

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CHAIN OF CUSTODY

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

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0438

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	Dissolved Metals	REMARKS
22-0438-01	5-3-22	1052	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-02		1425	GW	OW-10	10	4	1	1	1	2			x	x	x	x	x	x	x	x	x	
-03		0927	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-04		1242	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-05		0759	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-06		0735	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-07		0825	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-08		—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-09		1305	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		
-10		1242	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		

RELINQUISHED BY: [signature] DATE/TIME: 5-3-22/1530 RECEIVED BY: FedEx

RELINQUISHED BY: Fed Ex DATE/TIME: 05.04.22 10:25 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 0.4-3.8 °C Cal. Due Date: 6-3-22

Analytical Laboratory Report

Report ID: S35621.01(01)
Generated on 05/06/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S35621.01-S35621.10
Project: 22-0438 PR#22050489
Collected Date(s): 05/03/2022
Submitted Date/Time: 05/05/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S35621.01	22-0438-01 (DEK-MW-15003)	Groundwater	05/03/22 10:52
S35621.02	22-0438-02 (OW-10)	Groundwater	05/03/22 14:25
S35621.03	22-0438-03 (OW-11)	Groundwater	05/03/22 09:27
S35621.04	22-0438-04 (OW-12)	Groundwater	05/03/22 12:42
S35621.05	22-0438-05 (KLI-SCS)	Groundwater	05/03/22 07:59
S35621.06	22-0438-06 (KLI-PCS)	Groundwater	05/03/22 07:35
S35621.07	22-0438-07 (SW-DITCH)	Groundwater	05/03/22 08:25
S35621.08	22-0438-08 (DUP-KLI)	Groundwater	05/03/22 00:01
S35621.09	22-0438-09 (EB-KLI)	Groundwater	05/03/22 13:05
S35621.10	22-0438-10 (FB-KLI)	Groundwater	05/03/22 12:42

Analytical Laboratory Report

Lab Sample ID: S35621.01
Sample Tag: 22-0438-01 (DEK-MW-15003)
Collected Date/Time: 05/03/2022 10:52
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 14:08, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.02
Sample Tag: 22-0438-02 (OW-10)
Collected Date/Time: 05/03/2022 14:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 14:10, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.03
Sample Tag: 22-0438-03 (OW-11)
Collected Date/Time: 05/03/2022 09:27
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 14:12, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.04
Sample Tag: 22-0438-04 (OW-12)
Collected Date/Time: 05/03/2022 12:42
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.05
Sample Tag: 22-0438-05 (KLI-SCS)
Collected Date/Time: 05/03/2022 07:59
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:16, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.06
Sample Tag: 22-0438-06 (KLI-PCS)
Collected Date/Time: 05/03/2022 07:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.07
Sample Tag: 22-0438-07 (SW-DITCH)
Collected Date/Time: 05/03/2022 08:25
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:20, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.08
Sample Tag: 22-0438-08 (DUP-KLI)
Collected Date/Time: 05/03/2022 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:22, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.09
Sample Tag: 22-0438-09 (EB-KLI)
Collected Date/Time: 05/03/2022 13:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:24, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35621.10
Sample Tag: 22-0438-10 (FB-KLI)
Collected Date/Time: 05/03/2022 12:42
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:26, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID: S35621
Client: CONSUMERS (Consumers Energy)
Project: 22-0438 PR#22050489
Submitted: 05/05/2022 08:15 Login User: MMC

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[ ] Yes	[X] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S35621 Submitted: 05/05/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0438 PR#22050489

Initial Preservation Check: 05/05/2022 08:53 MMC

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S35621.01	125ml Plastic NaOH	>12			
S35621.02	125ml Plastic NaOH	>12			
S35621.03	125ml Plastic NaOH	>12			
S35621.04	125ml Plastic NaOH	>12			
S35621.05	125ml Plastic NaOH	>12			
S35621.06	125ml Plastic NaOH	>12			
S35621.07	125ml Plastic NaOH	>12			
S35621.08	125ml Plastic NaOH	>12			
S35621.09	125ml Plastic NaOH	>12			
S35621.10	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 22-0438 PR#22050489 (8 EB 050422)
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
35621.01	05/03/22	1052	22-0438-01 (DEK-MW-15003)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	05/03/22	1425	22-0438-02 (OW-10)	GW	1					1			✓	"
.03	05/03/22	0927	22-0438-03 (OW-11)	GW	1					1			✓	"
.04	05/03/22	1242	22-0438-04 (OW-12)	GW	1					1			✓	"
.05	05/03/22	0759	22-0438-05 (KLI-SCS)	GW	1					1			✓	"
.06	05/03/22	0735	22-0438-06 (KLI-PCS)	GW	1					1			✓	"
.07	05/03/22	0825	22-0438-07 (SW-DITCH)	GW	1					1			✓	"
.08	05/03/22	-	22-0438-08 (DUP-KLI)	GW	1					1			✓	"
.09	05/03/22	1305	22-0438-09 (EB-KLI)	GW	1					1			✓	"
.10	05/03/22	1242	22-0438-10 (FB-KLI)	GW	1					1			✓	"

RELINQUISHED BY: SIGNATURE/ORGANIZATION: CONSUMERS ENERGY ☐ Sampler | DATE: 05-04-22 | TIME: 1820
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box | DATE: 5/5/22 | TIME: 0815
RELINQUISHED BY: SIGNATURE/ORGANIZATION: M Dilcato | DATE: 5/5/22 | TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: | DATE: | TIME:

SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS
SEAL NO. | SEAL INTACT YES☐ NO☐ | INITIALS

NOTES: TEMP. ON ARRIVAL 3.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 12, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q2-2022 DEK Lined Impoundment
22-0438

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/06/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 81648 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00146**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-01 DEK-MW-15003**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4500**	ug/L	1000	SM5310B	RG	05/10/2022
Total Organic Carbon	**3800**	ug/L	1000	SM5310B	RG	05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/12/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00147**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-02 OW-10**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**10000**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**9000**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 5/12/2022

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Brighton, Michigan 48114
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e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00148**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-03 OW-11**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**8100**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**6500**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 5/12/2022

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NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00149**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-04 OW-12**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4700**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**2300**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 5/12/2022

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Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00150**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-05 KLI-SCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4900**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**3800**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 5/12/2022

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EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00151**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-06 KLI-PCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**3300**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**2500**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 5/12/2022

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EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00152**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-07 SW-DITCH**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**9100**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**7000**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/12/2022

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e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00153**

Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-08 DUP-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Total Organic Carbon	**3800**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/12/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
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e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00154**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-09 EB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/12/2022

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Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/12/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81648**
BA Sample ID: **CR00155**
Project Name: **Q2-2022 DEK Lined Impoundment**
Project Number: **22-0438**
Sample ID: **22-0438-10 FB_KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	05/11/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/12/2022

CHAIN OF CUSTODY

81648

Consumers Energy — Count on Us®

CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

Page _____ of _____

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Lined Impoundment	PROJECT NUMBER: 22-0438	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____	REQUESTER: Emil Blaj	
SEND REPORT TO: Emil Blaj	email: Emil.Blaj@cmsenergy.com	phone:	
COPY TO:	MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste		

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	ANALYSIS REQUESTED: Total Organic Carbon	Dissolved Organic Carbon								REMARKS
22-0438-01	05/03/2022	1052	GW	DEK-MW-15003	2					2			x	x						CRO		146
-02	05/03/2022	1425	GW	OW-10	2					2			x	x								147
-03	05/03/2022	0927	GW	OW-11	2					2			x	x								148
-04	05/03/2022	1242	GW	OW-12	2					2			x	x								149
-05	05/03/2022	0759	W	KLI-SCS	2					2			x	x								150
-06	05/03/2022	0735	SW	KLI-PCS	2					2			x	x								151
-07	05/03/2022	0825	SW	SW-DITCH	2					2			x	x								152
-08	05/03/2022	-	GW	DUP-KLI	1					1			x									153
-09	05/03/2022	1305	W	EB-KLI	2					2			x	x								154
-10	05/03/2022	1242	W	FB-KLI	2					2			x	x								155

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

RELINQUISHED BY: Leeann Kopsa	DATE/TIME: 5.06.22 1555	RECEIVED BY:
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS: PR 22050507

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

Temperature: 3.4 °C Cal. Due Date: _____

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 5/11/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CR00151	TV=10000	2500	107/109	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CR00151	13200	13300	0.75	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	109		
Method Standard (Lab. Control Spike):		#3046.6	106		

COMMENTS:

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 5/11/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CR00151	TV=10000	3300	105/107	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CR00151	13800	14000	1.40	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	109		
Method Standard (Lab. Control Spike):		#3046.6	106		

COMMENTS:

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 5/10/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CR00137	TV=10000	4400	114/117	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CR00137	15800	16100	1.90	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	93		
Method Standard (Lab. Control Spike):		#3046.6	108		

COMMENTS: _____

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 5/10/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CR00137	TV=10000	4800	106/87	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CR00137	15400	13500	13.10	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	93		
Method Standard (Lab. Control Spike):		#3046.6	108		

COMMENTS: _____

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 22, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2022 Q2

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0437

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area on 05/03/2022, for the 2nd Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 05/04/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

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

II. Methodology

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

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q2-2022 DEK Bottom Ash Pond & Lined Impoundment
Date Received: 5/4/2022
Chemistry Project: 22-0437

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0437-01	DEK-MW-18001	Groundwater	05/03/2022 01:44 PM	DEK Bottom Ash Pond & Lined Impoundment
22-0437-02	DEK-MW-18001 MS	Groundwater	05/03/2022 01:44 PM	DEK Bottom Ash Pond & Lined Impoundment
22-0437-03	DEK-MW-18001 MSD	Groundwater	05/03/2022 01:44 PM	DEK Bottom Ash Pond & Lined Impoundment

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-0437-01
Matrix: Groundwater

Laboratory Project: **22-0437**
Collect Date: 05/03/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0437-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	113		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	164		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	869		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	63700		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	1360		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	22		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	13300		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	200		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	3		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	4270		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	2		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	97400		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0437-01-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0437-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0437-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	65900		ug/L	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-0437-01
Matrix: Groundwater

Laboratory Project: **22-0437**
Collect Date: 05/03/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0437-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	187000		ug/L	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0437-01-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2040		ug/L	25.0	05/09/2022	AB22-0509-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0437-01-C04-A01 **Analyst: CET**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	555		mg/L	10.0	05/05/2022	AB22-0505-01

Alkalinity by SM 2320B

Aliquot #: 22-0437-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	174000		ug/L	10000.0	05/09/2022	AB22-0509-08
Alkalinity Bicarbonate	174000		ug/L	10000.0	05/09/2022	AB22-0509-08
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-08

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0437-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-15

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0437-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4400		ug/L	1000.0	05/10/2022	AB22-0519-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0437-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4800		ug/L	1000.0	05/10/2022	AB22-0519-09

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-0437-02
Matrix: Groundwater

Laboratory Project: **22-0437**
Collect Date: 05/03/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0437-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	110		%	1.0	05/05/2022	AB22-0505-08
Arsenic	94		%	1.0	05/05/2022	AB22-0505-08
Barium	104		%	5.0	05/05/2022	AB22-0505-08
Beryllium	100		%	1.0	05/05/2022	AB22-0505-08
Boron	107		%	20.0	05/05/2022	AB22-0505-08
Cadmium	104		%	0.2	05/05/2022	AB22-0505-08
Calcium	102		%	1000.0	05/10/2022	AB22-0505-08
Chromium	97		%	1.0	05/05/2022	AB22-0505-08
Cobalt	98		%	6.0	05/05/2022	AB22-0505-08
Copper	92		%	1.0	05/05/2022	AB22-0505-08
Iron	114		%	20.0	05/05/2022	AB22-0505-08
Lead	99		%	1.0	05/05/2022	AB22-0505-08
Lithium	101		%	10.0	05/05/2022	AB22-0505-08
Magnesium	111		%	1000.0	05/10/2022	AB22-0505-08
Manganese	97		%	5.0	05/05/2022	AB22-0505-08
Molybdenum	111		%	5.0	05/05/2022	AB22-0505-08
Nickel	92		%	2.0	05/05/2022	AB22-0505-08
Potassium	109		%	100.0	05/10/2022	AB22-0505-08
Selenium	97		%	1.0	05/05/2022	AB22-0505-08
Silver	115		%	0.2	05/05/2022	AB22-0505-08
Sodium	114		%	1000.0	05/10/2022	AB22-0505-08
Thallium	98		%	2.0	05/05/2022	AB22-0505-08
Vanadium	101		%	2.0	05/05/2022	AB22-0505-08
Zinc	93		%	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0437-02-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	101		%	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0437-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	93		%	100.0	05/04/2022	AB22-0504-08
Nitrite	93		%	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0437-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	108		%	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-0437-02
Matrix: Groundwater

Laboratory Project: **22-0437**
Collect Date: 05/03/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0437-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	83		%	1000.0	05/04/2022	AB22-0505-07
Sulfate	108		%	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0437-02-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	99		%	25.0	05/09/2022	AB22-0509-09

Alkalinity by SM 2320B

Aliquot #: 22-0437-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	96.2		%	10000.0	05/09/2022	AB22-0509-08

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0437-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	20.0	05/06/2022	AB22-0509-15

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0437-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	114		%	1000.0	05/10/2022	AB22-0519-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0437-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	106		%	1000.0	05/10/2022	AB22-0519-09

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-0437-03
Matrix: Groundwater

Laboratory Project: **22-0437**
Collect Date: 05/03/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0437-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	108		%	1.0	05/05/2022	AB22-0505-08
Arsenic	91		%	1.0	05/05/2022	AB22-0505-08
Barium	101		%	5.0	05/05/2022	AB22-0505-08
Beryllium	101		%	1.0	05/05/2022	AB22-0505-08
Boron	111		%	20.0	05/05/2022	AB22-0505-08
Cadmium	103		%	0.2	05/05/2022	AB22-0505-08
Calcium	102		%	1000.0	05/10/2022	AB22-0505-08
Chromium	97		%	1.0	05/05/2022	AB22-0505-08
Cobalt	96		%	6.0	05/05/2022	AB22-0505-08
Copper	91		%	1.0	05/05/2022	AB22-0505-08
Iron	113		%	20.0	05/05/2022	AB22-0505-08
Lead	99		%	1.0	05/05/2022	AB22-0505-08
Lithium	103		%	10.0	05/05/2022	AB22-0505-08
Magnesium	114		%	1000.0	05/10/2022	AB22-0505-08
Manganese	94		%	5.0	05/05/2022	AB22-0505-08
Molybdenum	110		%	5.0	05/05/2022	AB22-0505-08
Nickel	90		%	2.0	05/05/2022	AB22-0505-08
Potassium	109		%	100.0	05/10/2022	AB22-0505-08
Selenium	92		%	1.0	05/05/2022	AB22-0505-08
Silver	113		%	0.2	05/05/2022	AB22-0505-08
Sodium	116		%	1000.0	05/10/2022	AB22-0505-08
Thallium	99		%	2.0	05/05/2022	AB22-0505-08
Vanadium	98		%	2.0	05/05/2022	AB22-0505-08
Zinc	91		%	10.0	05/05/2022	AB22-0505-08

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0437-03-C01-A02 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	94.0		%	0.2	05/09/2022	AB22-0509-01

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0437-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	93		%	100.0	05/04/2022	AB22-0504-08
Nitrite	93		%	100.0	05/04/2022	AB22-0504-08

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

Aliquot #: 22-0437-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	113		%	1000.0	05/06/2022	AB22-0505-07

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Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-0437-03
Matrix: Groundwater

Laboratory Project: **22-0437**
Collect Date: 05/03/2022
Collect Time: 01:44 PM

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

Aliquot #: 22-0437-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	83		%	1000.0	05/04/2022	AB22-0505-07
Sulfate	114		%	1000.0	05/06/2022	AB22-0505-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0437-03-C03-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	103		%	25.0	05/09/2022	AB22-0509-09

Alkalinity by SM 2320B

Aliquot #: 22-0437-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	96.7		%	10000.0	05/09/2022	AB22-0509-08

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0437-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	20.0	05/06/2022	AB22-0509-15

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0437-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	117		%	1000.0	05/10/2022	AB22-0519-08

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0437-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	87		%	1000.0	05/10/2022	AB22-0519-09

Data Qualifiers	Exception Summary
	No exceptions occurred.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0437

Inspection Date: 05/04/22 **Inspection By:** CLH

Sample Origin/Project Name: DEK LI + BAP

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 272720301342 Shipping Form Attached: Yes X 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 1.2-1.6°C Samples Received on Ice: Yes X No _____

015402 exp: 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)	40=6	___	_____	_____	_____
Quart/Liter (g/p)	60=6	___	_____	_____	_____
9-oz (amber glass jar)	_____	___	_____	_____	_____
2-oz (amber glass)	_____	___	_____	_____	_____
125 mL (plastic)	12	___	_____	_____	_____
24 mL vial (glass)	_____	___	_____	_____	_____
250 500 mL (plastic)	1	___	_____	_____	_____
Other _____	_____	___	_____	_____	_____

PH paper 0-14
lot# 222420
exp: 8.1.23

PG. 2&2 not needed

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Bottom Ash Pond & Lined Impound.	PROJECT NUMBER: 22-0437	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER	REQUESTER: Harold Register	
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register / TRC	MATRIX CODES: GW = Groundwater, WW = Wastewater, W = Water / Aqueous Liquid, S = Soil / General Solid, O = Oil, OX = Other, SL = Sludge, A = Air, WP = Wipe, WT = General Waste		

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0437-01	5/3/22	1344	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	"	1344	GW	DEK-MW-18001 MS	8	3	1	1	1	2			x	x	x		x	x	x	x	
-03	"	1344	GW	DEK-MW-18001 MSD	8	3	1	1	1	2			x	x	x		x	x	x	x	

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
	5/3/22 1427	Fed Ex
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
Fed Ex	05-04-22 10:25	

COMMENTS:

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

Temperature: 1.2-1.6 °C Cal. Due Date: 6-3-22

Analytical Laboratory Report

Report ID: S35622.01(01)
Generated on 05/06/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S35622.01-S35622.03
Project: 22-0437 PR#22050489
Collected Date(s): 05/03/2022
Submitted Date/Time: 05/05/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S35622.01	22-0437-01 (DEK-MW-18001)	Groundwater	05/03/22 07:18
S35622.02	22-0437-01 (DEK-MW-18001 Field MS)	Groundwater	05/03/22 08:05
S35622.03	22-0437-01 (DEK-MW-18001 Field MSD)	Groundwater	05/03/22 09:20

Analytical Laboratory Report

Lab Sample ID: S35622.01
Sample Tag: 22-0437-01 (DEK-MW-18001)
Collected Date/Time: 05/03/2022 07:18
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S35622.02
Sample Tag: 22-0437-01 (DEK-MW-18001 Field MS)
Collected Date/Time: 05/03/2022 08:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:10, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.183	0.02	0.005	mg/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L

Analytical Laboratory Report

Lab Sample ID: S35622.03
Sample Tag: 22-0437-01 (DEK-MW-18001 Field MSD)
Collected Date/Time: 05/03/2022 09:20
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:12, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.183	0.02	0.005	mg/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L

Merit Laboratories Login Checklist

Lab Set ID: S35622
Client: CONSUMERS (Consumers Energy)
Project: 22-0437 PR#22050489
Submitted: 05/05/2022 08:15 Login User: MMC

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.2
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[ ] Yes	[X] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S35622 Submitted: 05/05/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0437 PR#22050489

Initial Preservation Check: 05/05/2022 08:56 MMC

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S35622.01	125ml Plastic NaOH	>12			
S35622.02	125ml Plastic NaOH	>12			
S35622.03	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson STATE: MI ZIP CODE: 49201
PHONE NO.: 517-788-5888 FAX NO.: 517-788-2533 P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 22-0437 PR#22050489 EB 050422
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other
Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
35622.01	05/03/22	0718	22-0437-01 (DEK-MW-18001)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	05/03/22	0805	22-0437-02 (DEK-MW-18001 Field MS)	GW	1					1			✓	"
.03	05/03/22	0920	22-0437-03 (DEK-MW-18001 Field MSD)	GW	1					1			✓	"
														Please spike MS/MSD and report
														spike concentration and/or rec.

RELINQUISHED BY: SIGNATURE/ORGANIZATION: CONSUMERS ENERGY ☐ Sampler DATE: 05-04-22 TIME: 1820
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box DATE: 5/5/22 TIME: 0815
RELINQUISHED BY: SIGNATURE/ORGANIZATION: DATE: TIME:
RECEIVED BY: SIGNATURE/ORGANIZATION: M Chilcote DATE: 5/5/22 TIME: 0815

SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS
SEAL NO. SEAL INTACT YES☐ NO☐ INITIALS

NOTES: TEMP. ON ARRIVAL: 3.2

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.16.12

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 11, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q2-2022 DEK Bottom Ash Pond&Lined Impound
22-0437

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/06/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 81646 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/11/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81646**
BA Sample ID: **CR00137**
Project Name: **Q2-2022 DEK Bottom Ash Pond&Lined Impound**
Project Number: **22-0437**
Sample ID: **22-0437-01 DEK-MW-18001**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4800**	ug/L	5000	SM5310B	RG	05/10/2022
Total Organic Carbon	**4400**	ug/L	1000	SM5310B	RG	05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Elevated DOC dl due to sample matrix.

Released by

Date 5/11/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/11/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81646**
BA Sample ID: **CR00138**
Project Name: **Q2-2022 DEK Bottom Ash Pond&Lined Impound**
Project Number: **22-0437**
Sample ID: **22-0437-02 DEK-MW-18001 MS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**106%**	ug/L		SM5310B	RG	05/10/2022
Total Organic Carbon	**114%**	ug/L		SM5310B	RG	05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/11/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 05/03/2022
Submit Date: 05/06/2022
Report Date: 05/11/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **81646**
BA Sample ID: **CR00139**
Project Name: **Q2-2022 DEK Bottom Ash Pond&Lined Impound**
Project Number: **22-0437**
Sample ID: **22-0437-03 DEK-MW-18001 MSD**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**87%**	ug/L		SM5310B	RG	05/10/2022
Total Organic Carbon	**117%**	ug/L		SM5310B	RG	05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 5/11/2022

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$1646

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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Page _____ of _____

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-0437

SAP CC or WO#:

REQUESTER: Emil Blaj

SAMPLING TEAM:

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

SEND REPORT TO: Emil Blaj — email:Emil.Blaj@cmsenergy.com — phone:

COPY TO:

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 Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0437-01	05/03/2022	1344	GW	DEK-MW-18001	2					2			x	x	137
-02	05/03/2022	1344	GW	DEK-MW-18001 MS	2					2			x	x	138
-03	05/03/2022	1344	GW	DEK-MW-18001 MSD	2					2			x	x	139

22-0437 Page 29 of 32

RELINQUISHED BY: Yelena Okpa — DATE/TIME: 5.06.22 1555 — RECEIVED BY:

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

COMMENTS: PR 2209050507

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

Temperature: 3.4 °C — Cal. Due Date: _____

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 5/10/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CR00137	TV=10000	4400	114/117	80 - 120	ND

Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CR00137	15800	16100	1.90	≤ 20	

MISCELLANEOUS			
	Standard ID #	**%Recoveries**	
Independent Secondary Reference Material:	#4295.1	93	
Method Standard (Lab. Control Spike):	#3046.6	108	

COMMENTS: _____

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 5/10/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CR00137	TV=10000	4800	106/87	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CR00137	15400	13500	13.10	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	93		
Method Standard (Lab. Control Spike):		#3046.6	108		

COMMENTS: _____

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Tel: (330)497-9396

Laboratory Job ID: 240-166155-1
Client Project/Site: CCR DEK Lined Impoundment

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by:
6/12/2022 7:47:37 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Qualifiers

Rad

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
U	Result is less than the sample detection limit.

Glossary

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

Job ID: 240-166155-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-166155-1

Comments
The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

Receipt
The samples were received on 5/6/2022 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9º C, 1.3º C and 1.4º C.

RAD
Method 903.0: Radium-226 batch 564568
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. OW-10 (240-166155-1), OW-11 (240-166155-2), OW-12 (240-166155-3), KLI-DUP (240-166155-4), EB-KLI (240-166155-5), DEK-MW-15003 (240-166155-6), KLI-SCS (240-166155-7), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

Method 904.0: Radium-228 batch 564569
The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

Method 904.0: Radium-228 batch 564569
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. OW-10 (240-166155-1), OW-11 (240-166155-2), OW-12 (240-166155-3), KLI-DUP (240-166155-4), EB-KLI (240-166155-5), DEK-MW-15003 (240-166155-6), KLI-SCS (240-166155-7), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

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

Method Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166155-1	OW-10	Water	05/03/22 14:25	05/06/22 08:00
240-166155-2	OW-11	Water	05/03/22 09:27	05/06/22 08:00
240-166155-3	OW-12	Water	05/03/22 12:42	05/06/22 08:00
240-166155-4	KLI-DUP	Water	05/03/22 00:00	05/06/22 08:00
240-166155-5	EB-KLI	Water	05/03/22 13:05	05/06/22 08:00
240-166155-6	DEK-MW-15003	Water	05/03/22 10:52	05/06/22 08:00
240-166155-7	KLI-SCS	Water	05/03/22 07:59	05/06/22 08:00

Client Sample ID: OW-10

Date Collected: 05/03/22 14:25
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-1

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.383	U	0.343	0.344	1.00	0.530	pCi/L	05/10/22 09:51	06/07/22 20:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.0*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.246	U *	0.372	0.373	1.00	0.632	pCi/L	05/10/22 10:04	06/07/22 15:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.0*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*
Y Carrier	*84.5*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.629	U	0.506	0.507	5.00	0.632	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Client Sample ID: OW-11

Date Collected: 05/03/22 09:27
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-2

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.102	U	0.216	0.216	1.00	0.387	pCi/L	05/10/22 09:51	06/07/22 20:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.288	U *	0.321	0.322	1.00	0.525	pCi/L	05/10/22 10:04	06/07/22 15:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*
Y Carrier	*87.9*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.391	U	0.387	0.388	5.00	0.525	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Client Sample ID: OW-12

Date Collected: 05/03/22 12:42
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-3

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.260	U	0.225	0.226	1.00	0.337	pCi/L	05/10/22 09:51	06/07/22 20:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.8*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.360	U *	0.288	0.290	1.00	0.440	pCi/L	05/10/22 10:04	06/07/22 15:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.8*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*
Y Carrier	*87.5*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.620**		0.365	0.368	5.00	0.440	pCi/L		06/08/22 13:03	1

Client Sample ID: KLI-DUP

Date Collected: 05/03/22 00:00
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-4

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0303	U	0.225	0.225	1.00	0.457	pCi/L	05/10/22 09:51	06/07/22 20:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.8*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:01*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.406	U *	0.342	0.344	1.00	0.534	pCi/L	05/10/22 10:04	06/07/22 15:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.8*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*
Y Carrier	*89.0*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.376	U	0.409	0.411	5.00	0.534	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Client Sample ID: EB-KLI

Date Collected: 05/03/22 13:05
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-5

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0438	U	0.222	0.222	1.00	0.471	pCi/L	05/10/22 09:51	06/07/22 20:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*67.3*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:01*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.170	U *	0.302	0.303	1.00	0.525	pCi/L	05/10/22 10:04	06/07/22 15:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*67.3*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*
Y Carrier	*89.3*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:36*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.126	U	0.375	0.376	5.00	0.525	pCi/L		06/08/22 13:03	1

Client Sample ID: DEK-MW-15003

Date Collected: 05/03/22 10:52
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-6

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.105	U	0.233	0.233	1.00	0.417	pCi/L	05/10/22 09:51	06/07/22 20:02	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.5*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:02*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.694**	*	0.345	0.351	1.00	0.472	pCi/L	05/10/22 10:04	06/07/22 15:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.5*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:37*	*1*
Y Carrier	*89.0*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:37*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.799**		0.416	0.421	5.00	0.472	pCi/L		06/08/22 13:03	1

Client Sample ID: KLI-SCS

Date Collected: 05/03/22 07:59
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-7

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0800	U	0.205	0.205	1.00	0.440	pCi/L	05/10/22 09:51	06/07/22 20:02	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:02*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.337	U *	0.310	0.311	1.00	0.492	pCi/L	05/10/22 10:04	06/07/22 15:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.0*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:38*	*1*
Y Carrier	*91.2*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:38*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.257	U	0.372	0.372	5.00	0.492	pCi/L		06/08/22 13:03	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
240-166155-1	OW-10	92.0
240-166155-2	OW-11	89.0
240-166155-3	OW-12	90.8
240-166155-4	KLI-DUP	80.8
240-166155-5	EB-KLI	67.3
240-166155-6	DEK-MW-15003	90.5
240-166155-7	KLI-SCS	89.0
LCS 160-564568/1-A	Lab Control Sample	94.3
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3
MB 160-564568/23-A	Method Blank	99.3

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
240-166155-1	OW-10	92.0	84.5
240-166155-2	OW-11	89.0	87.9
240-166155-3	OW-12	90.8	87.5
240-166155-4	KLI-DUP	80.8	89.0
240-166155-5	EB-KLI	67.3	89.3
240-166155-6	DEK-MW-15003	90.5	89.0
240-166155-7	KLI-SCS	89.0	91.2
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5
MB 160-564569/23-A	Method Blank	99.3	91.2

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A
Matrix: Water
Analysis Batch: 569008

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564568

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.002143	U	0.135	0.135	1.00	0.285	pCi/L	05/10/22 09:51	06/07/22 20:02	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:02*	*1*

Lab Sample ID: LCS 160-564568/1-A
Matrix: Water
Analysis Batch: 568823

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564568

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.625		1.28	1.00	0.274	pCi/L	85	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.3*		*40 - 110*

Lab Sample ID: LCSD 160-564568/2-A
Matrix: Water
Analysis Batch: 568823

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 564568

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	9.709		1.34	1.00	0.405	pCi/L	86	75 - 125	0.03	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*82.3*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A
Matrix: Water
Analysis Batch: 568850

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564569

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.03881	U	0.215	0.215	1.00	0.396	pCi/L	05/10/22 10:04	06/07/22 15:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:38*	*1*
Y Carrier	*91.2*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:38*	*1*

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A
Matrix: Water
Analysis Batch: 569007

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564569

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.55	6.624		1.00	1.00	0.571	pCi/L	77	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.3*		*40 - 110*
Y Carrier	*84.9*		*40 - 110*

Lab Sample ID: LCSD 160-564569/2-A
Matrix: Water
Analysis Batch: 569007

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 564569

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.55	9.176	*	1.28	1.00	0.579	pCi/L	107	75 - 125	1.12	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*82.3*		*40 - 110*
Y Carrier	*84.5*		*40 - 110*

Rad

Prep Batch: 564568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166155-1	OW-10	Total/NA	Water	PrecSep STD	
240-166155-2	OW-11	Total/NA	Water	PrecSep STD	
240-166155-3	OW-12	Total/NA	Water	PrecSep STD	
240-166155-4	KLI-DUP	Total/NA	Water	PrecSep STD	
240-166155-5	EB-KLI	Total/NA	Water	PrecSep STD	
240-166155-6	DEK-MW-15003	Total/NA	Water	PrecSep STD	
240-166155-7	KLI-SCS	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166155-1	OW-10	Total/NA	Water	PrecSep_0	
240-166155-2	OW-11	Total/NA	Water	PrecSep_0	
240-166155-3	OW-12	Total/NA	Water	PrecSep_0	
240-166155-4	KLI-DUP	Total/NA	Water	PrecSep_0	
240-166155-5	EB-KLI	Total/NA	Water	PrecSep_0	
240-166155-6	DEK-MW-15003	Total/NA	Water	PrecSep_0	
240-166155-7	KLI-SCS	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Client Sample ID: OW-10
Date Collected: 05/03/22 14:25
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 20:00	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: OW-11
Date Collected: 05/03/22 09:27
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 20:00	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: OW-12
Date Collected: 05/03/22 12:42
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 20:00	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: KLI-DUP
Date Collected: 05/03/22 00:00
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166155-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 20:01	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Lined Impoundment

Job ID: 240-166155-1

Client Sample ID: EB-KLI

Lab Sample ID: 240-166155-5

Date Collected: 05/03/22 13:05

Matrix: Water

Date Received: 05/06/22 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 20:01	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: DEK-MW-15003

Lab Sample ID: 240-166155-6

Date Collected: 05/03/22 10:52

Matrix: Water

Date Received: 05/06/22 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 20:02	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:37	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Client Sample ID: KLI-SCS

Lab Sample ID: 240-166155-7

Date Collected: 05/03/22 07:59

Matrix: Water

Date Received: 05/06/22 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 20:02	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568850	06/07/22 15:38	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-166155-1
Project/Site: CCR DEK Lined Impoundment

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing America

Client Information	Sampler: Jacob Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-94788-29054.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Lined Impoundment	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
OW-10	5-3-22	1425	G	Water	N	N	X	X		
OW-11	5-3-22	0927	G	Water			X	X		
OW-12	5-3-22	1242	G	Water			X	X		
KLI-DUP	5-3-22	—	G	Water			X	X		
EB-KLI	5-7-22	1705	G	Water			X	X		
DEK-MW-15003	5-3-22	1052	G	Water			X	X		
KLI-SCS	5-3-22	0759	G	Water			X	X		
				Water						

240-166155 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		5-5-22 1330	TRC		5/5/22 1330	FEDEX
2		5/5/22 1330	FEDEX		5-6-22 0800	GEL
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 166155
Canton Facility

Client TRC Site Name _____ Cooler unpacked by: YMP

Cooler Received on 5-6-22 Opened on 5-6-22

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag (None) Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-13 (CF **0.0** °C) Observed Cooler Temp._____ °C Corrected Cooler Temp._____ °C
   IR GUN #IR-15 (CF **-0.7**°C) Observed Cooler Temp._____ °C Corrected Cooler Temp._____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 ea (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)? (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? (Yes) No NA pH Strip Lot# HC157842
14. Were VOAs on the COC? Yes (No)
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes (No)
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 166155

Eurofins - Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	**IR-13** IR-15	1.3	1.3	**Wet Ice** Blue Ice Dry Ice Water None
TA Client Box Other	**IR-13** IR-15	1.4	1.4	**Wet Ice** Blue Ice Dry Ice Water None
TA Client Box Other	**IR-13** IR-15	0.9	0.9	**Wet Ice** Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
OW-10	240-166155-A-1	Plastic 1 liter - Nitric Acid	<2			
OW-10	240-166155-B-1	Plastic 1 liter - Nitric Acid	<2			
OW-11	240-166155-A-2	Plastic 1 liter - Nitric Acid	<2			
OW-11	240-166155-B-2	Plastic 1 liter - Nitric Acid	<2			
OW-12	240-166155-A-3	Plastic 1 liter - Nitric Acid	<2			
OW-12	240-166155-B-3	Plastic 1 liter - Nitric Acid	<2			
KLI-DUP	240-166155-A-4	Plastic 1 liter - Nitric Acid	<2			
KLI-DUP	240-166155-B-4	Plastic 1 liter - Nitric Acid	<2			
EB-KLI	240-166155-A-5	Plastic 1 liter - Nitric Acid	<2			
EB-KLI	240-166155-B-5	Plastic 1 liter - Nitric Acid	<2			
DEK-MW-15003	240-166155-A-6	Plastic 1 liter - Nitric Acid	<2			
DEK-MW-15003	240-166155-B-6	Plastic 1 liter - Nitric Acid	<2			
KLI-SCS	240-166155-A-7	Plastic 1 liter - Nitric Acid	<2			
KLI-SCS	240-166155-B-7	Plastic 1 liter - Nitric Acid	<2			

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-151693.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-166155-1
Address: 13715 Rider Trail North,	Due Date Requested: 6/7/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: CCR DEK Lined Impoundment	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
OW-10 (240-166155-1)	5/3/22	14:25 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
OW-11 (240-166155-2)	5/3/22	09:27 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
OW-12 (240-166155-3)	5/3/22	12:42 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
KLI-DUP (240-166155-4)	5/3/22	Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
EB-KLI (240-166155-5)	5/3/22	13:05 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
DEK-MW-15003 (240-166155-6)	5/3/22	10:52 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
KLI-SCS (240-166155-7)	5/3/22	07:59 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[illegible]	5-6-22 1428	ETA	FED EX		
2	FED EX			Sierra Worthington	MAY 0 9 2022 0835	ETMSTL
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-166155-1
SDG Number:

Login Number: 166155
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 05/09/22 02:40 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Tel: (330)497-9396

Laboratory Job ID: 240-166148-1
Client Project/Site: CCR DEK Bottom Ash Pond

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by:
6/10/2022 8:42:08 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Qualifiers

Rad

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
U	Result is less than the sample detection limit.

Glossary

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

Job ID: 240-166148-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-166148-1

Comments
The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

Receipt
The samples were received on 5/6/2022 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9º C, 1.3º C and 1.4º C.

RAD
Method 903.0: Radium-226 batch 564568
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

DEK-MW-18001 (240-166148-1), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

Method 904.0: Radium-228 batch 564569
The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

Method 904.0: Radium-228 batch 564569
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

DEK-MW-18001 (240-166148-1), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

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

Method Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166148-1	DEK-MW-18001	Water	05/04/22 13:44	05/06/22 08:00

Client Sample ID: DEK-MW-18001

Date Collected: 05/04/22 13:44
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166148-1

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.294		0.214	0.216	1.00	0.292	pCi/L	05/09/22 14:15	06/07/22 18:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.8*		*40 - 110*	*05/09/22 14:15*	*06/07/22 18:10*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.592	*	0.317	0.321	1.00	0.438	pCi/L	05/09/22 14:18	06/07/22 15:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.8*		*40 - 110*	*05/09/22 14:18*	*06/07/22 15:33*	*1*
Y Carrier	*87.5*		*40 - 110*	*05/09/22 14:18*	*06/07/22 15:33*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.885		0.382	0.387	5.00	0.438	pCi/L		06/08/22 13:03	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
240-166148-1	DEK-MW-18001	90.8
LCS 160-564568/1-A	Lab Control Sample	94.3
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3
MB 160-564568/23-A	Method Blank	99.3

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
240-166148-1	DEK-MW-18001	90.8	87.5
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5
MB 160-564569/23-A	Method Blank	99.3	91.2

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A
Matrix: Water
Analysis Batch: 569008

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564568

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.002143	U	0.135	0.135	1.00	0.285	pCi/L	05/10/22 09:51	06/07/22 20:02	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*40 - 110*	*05/10/22 09:51*	*06/07/22 20:02*	*1*

Lab Sample ID: LCS 160-564568/1-A
Matrix: Water
Analysis Batch: 568823

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564568

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.625		1.28	1.00	0.274	pCi/L	85	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.3*		*40 - 110*

Lab Sample ID: LCSD 160-564568/2-A
Matrix: Water
Analysis Batch: 568823

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 564568

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	9.709		1.34	1.00	0.405	pCi/L	86	75 - 125	0.03	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*82.3*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A
Matrix: Water
Analysis Batch: 568850

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 564569

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.03881	U	0.215	0.215	1.00	0.396	pCi/L	05/10/22 10:04	06/07/22 15:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:38*	*1*
Y Carrier	*91.2*		*40 - 110*	*05/10/22 10:04*	*06/07/22 15:38*	*1*

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A
Matrix: Water
Analysis Batch: 569007

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 564569

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.55	6.624		1.00	1.00	0.571	pCi/L	77	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.3*		*40 - 110*
Y Carrier	*84.9*		*40 - 110*

Lab Sample ID: LCSD 160-564569/2-A
Matrix: Water
Analysis Batch: 569007

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 564569

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.55	9.176	*	1.28	1.00	0.579	pCi/L	107	75 - 125	1.12	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*82.3*		*40 - 110*
Y Carrier	*84.5*		*40 - 110*

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Rad

Prep Batch: 564568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166148-1	DEK-MW-18001	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166148-1	DEK-MW-18001	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation.
Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Client Sample ID: DEK-MW-18001

Date Collected: 05/04/22 13:44
Date Received: 05/06/22 08:00

Lab Sample ID: 240-166148-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/09/22 14:15	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:10	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/09/22 14:18	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation.
Job ID: 240-166148-1
Project/Site: CCR DEK Bottom Ash Pond

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

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Client Information	Sampler: Jake Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-94787-29053.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond & I	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
~~DEK-MW-15003~~				~~Water~~						
DEK-MW-18001	5-4-22	1344	G	Water	N	N	X	X		
				Water						

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		5-5-22 / 1730	TRC		5/5/22 1336	EETA
2		5/5/22 1335	EETA		5-6-22 0800	EETAL
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 166148**
Canton Facility

Client TRC Site Name _____ Cooler unpacked by: YMP

Cooler Received on 5-6-22 Opened on 5-6-22

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag (None) Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt [X] See Multiple Cooler Form
   IR GUN# IR-13 (CF **0.0** °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF **-0.7**°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 ea	(Yes) No	**Tests that are not checked for pH by Receiving:**
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	**VOAs**
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	**Oil and Grease**
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)	**TOC**
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Y) (N) (Y)	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	(Yes) No NA	pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes (No)	
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes No (NA)	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes (No)	
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)	

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 166148

Eurofins - Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-13 IR-15	1.3	1.3	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	1.4	1.4	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	0.9	0.9	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
DEK-MW-18001	240-166148-A-1	Plastic 1 liter - Nitric Acid	<2			
DEK-MW-18001	240-166148-B-1	Plastic 1 liter - Nitric Acid	<2			

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-151693.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-166148-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 6/7/2022			Preservation Codes:
City: Earth City	TAT Requested (days):			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: CCR DEK Bottom Ash Pond	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
DEK-MW-18001 (240-166148-1)	5/4/22	13:44 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	5-6-22 1428	ETA	FED EX		
2	FED EX			Sierra Worthington	MAY 09 2022 0835	ETMSN
3						

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-166148-1
SDG Number:

Login Number: 166148
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 05/09/22 02:25 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix B
Field Notes

TRC

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance
PROJECT NUMBER:	464095.0001.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	5-2-22 TO 5-4-22
PURPOSE OF FIELDWORK:	First Semiannual CCR Sampling Event
WORK PERFORMED BY:	Jake Krenz, Javier Jasso, Henry Schnaidt

Jake Krenz 5-5-22
SIGNED DATE

Henry Schnaidt 5/5/22
CHECKED BY DATE

REVISED 04/2019

TRC

GENERAL NOTES

KLI/BAP

PROJECT NAME:	CEC ~~Karn LF~~: 2022 GW Compliand	DATE: 5/2/22	TIME ARRIVED: 0830
PROJECT NUMBER:	464095-~~0000~~0001-0000	AUTHOR: J. Jasso	TIME LEFT: 1330

WEATHER		
TEMPERATURE: 47 °F	WIND: 10 MPH	VISIBILITY: Clear Cool

WORK / SAMPLING PERFORMED

Walk Test

getting supplys

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS

SIGNED 5/5/22 DATE

CHECKED BY 5-5-22 DATE

REVISED 04/2019

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Comp	DATE: 5/2/22	TIME ARRIVED: 1030
PROJECT NUMBER:	464095.0001.0000	AUTHOR: ~~Andrew Whaley~~, Jake Kren HS	TIME LEFT: 1730

WEATHER		
TEMPERATURE: 50 °F	WIND: ~5 MPH	VISIBILITY: Cloudy/~~partly~~ Sunny

WORK / SAMPLING PERFORMED

- → Met Jake at gate
- → Got safety orientation
- → Met Jake to get equipment + bottles
- → Began sampling ~ 1230
- → completed sampling @ ~ 1730

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
—	—

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
J. Krentz	TRC	project comm.

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
GW	NM	Purged to ground

Henry Schwandt — SIGNED — DATE 5/5/22

Jake Kren — CHECKED BY — DATE 5-5-22

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Comp	DATE: 5-3-22	TIME ARRIVED: 0700
PROJECT NUMBER:	464095.0001.0000	AUTHOR: ~~Andrew Whaley,~~ Jake Krenz	TIME LEFT: 1600

WEATHER		
TEMPERATURE: 50 °F	WIND: 10-15 MPH	VISIBILITY: Rain / clouds

WORK / SAMPLING PERFORMED

Sampled wells: OW-10, OW-11, OW-12, DEK-MW-15003

Collected samples: KLI-PLS, KLI-SLS, and SW-Ditch

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
D. Lite	TRC	Site updates

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Purge water	DNM	purged to ground

Jake Krenz 5-5-22
SIGNED DATE

CHECKED BY 5/5/22 DATE

REVISED 04/2019

TRC

GENERAL NOTES

KLI/BAP

PROJECT NAME:	CEC ~~Karn LF~~: 2022 GW Complian	DATE: 5/3/22	TIME ARRIVED: 0600
PROJECT NUMBER:	464095.~~0000~~0001	AUTHOR: J. Jasso	TIME LEFT: 1415

WEATHER

TEMPERATURE: 47 °F WIND: 10 MPH VISIBILITY: Overcast Rain

WORK / SAMPLING PERFORMED

Wells Sampled MW-18, MS+MSD, 18, Dup #1, F.B #1
MW-22, OW-07 MW-23, OW-07, DFKMW 1800 MS+MSD
Shipping Standard

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
purge water	NM	purged to ground

5/5/22
SIGNED DATE

5-5-22
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Comp	DATE: 5/3/22	TIME ARRIVED: 630
PROJECT NUMBER:	464095.0001.0000	AUTHOR: ~~Andrew Whaley, Jake Krei~~ Henry Schmaidt	TIME LEFT: 330

WEATHER

TEMPERATURE: 47 °F WIND: ~5 MPH VISIBILITY: cloudy, drizzly

WORK / SAMPLING PERFORMED

Sampled DEK wells, got dup, field blank, equipment blank

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN
turb meter reading high	recalibrated turb meter

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
J. Klentz	TRC	project communication

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
GW	NM	purged to ground

Henry Schmaidt — SIGNED — DATE 5/5/22

Jake Krei — CHECKED BY — DATE 5-5-22

TRC

GENERAL NOTES

KLI/BAP

PROJECT NAME: CEC ~~Karn LF~~: 2022 GW Compliand	DATE: 5/4/22	TIME ARRIVED: 0900
PROJECT NUMBER: 464095.~~0000~~0001.0000	AUTHOR: J. Jusa	TIME LEFT: 1520

WEATHER		
TEMPERATURE: 42 °F	WIND: 20 MPH	VISIBILITY: Over Cast

WORK / SAMPLING PERFORMED

DEKMW-15004, Dup #2, DEKMW-22001, 22002, 22003, 22004, 22005, 22006

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
purge water	NM	purged to ground

SIGNED 5/5/22 DATE

CHECKED BY 5-5-22 DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW	SAMPLER NAME:	Henry Schaaidt ~~Andrew Whaley,~~ Jake Krenz, Javier Jass
PROJECT NO.:	464095.0001.0000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NA	NA
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PURGING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)

SAMPLING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
GEOTECH DISPOSABLE FILTER	0.45 MICRON
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

STORE BOUGHT	LABORATORY PROVIDED
POTABLE WATER SOURCE	DI WATER SOURCE
[signature] 5-5-22	HS 5/5/22
SIGNED DATE	CHECKED BY DATE

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Compliance	MODEL: Pro DSS	SAMPLER: HS ~~AW, JK, JJ~~
PROJECT NO.: 464095.0001.0000	SERIAL #: Rental	DATE: 5/2/22

PH CALIBRATION CHECK

pH 7 (LOT #): 26A918 (EXP. DATE): JAN/24	pH 4 / 10 (LOT #): 26B002 (EXP. DATE): FEB/24	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
7.00 / 7.00	4.00 / 4.00	☑ WITHIN RANGE	1215
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 167281 (EXP. DATE): OCT/22	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
1413 / 1413	17.7	☑ WITHIN RANGE	1220
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21G100575 (EXP. DATE): 2026-07-29	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
225.6 / 225.0	17.0	☑ WITHIN RANGE	1230
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING /SATURATED AIR			
9.21 / 9.21	17.9	☑ WITHIN RANGE	1235
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A1007 (EXP. DATE): JAN 23	(LOT #): DI (EXP. DATE):	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.00 / 0.00	100.00 / 100.00	☑ WITHIN RANGE	1245
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ ____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ ____	

NOTES

—

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS
—	—

SIGNED Henry Schwadt DATE 5/2/22

CHECKED BY [signature] DATE 5-5-22

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	MODEL: YSI PRO DSS	SAMPLER: AW, JK, JJ
PROJECT NO.:	464095.0001.0000	SERIAL #: Rental	DATE: 5-3-22

PH CALIBRATION CHECK

pH 7 (LOT #): 26A918 (EXP. DATE): Jun/24 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 26B062 (EXP. DATE): Feb/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.00 / 7.00	4.00 / 4.00	☒ WITHIN RANGE	0622
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 26A342 (EXP. DATE): Jun/27 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1413 / 1413	21.1	☒ WITHIN RANGE	0618
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21K100707 (EXP. DATE): 11-3-26 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
242.1 / 242.1	21.3	☒ WITHIN RANGE	0625
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
8.43 / 8.43	20.0	☒ WITHIN RANGE	0630
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): DI water (EXP. DATE): POST-CAL. READING / STANDARD	(LOT #): A1196 (EXP. DATE): Jul-23 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0.0 / 0.0	100.0 / 100.0	☒ WITHIN RANGE	0635
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED / CORRECTIVE ACTIONS

SIGNED 5-5-22 DATE

CHECKED BY HS 5/5/22 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC ~~Karn LE~~ KCI/BAP 2022 GW Compliance	MODEL:	Pro DSS	SAMPLER:	~~AW~~, JJ, ~~JK~~
PROJECT NO.:	464095.~~0000~~ 0001 .0000	SERIAL #:	A2	DATE:	5/3/22

PH CALIBRATION CHECK

pH 7 (LOT #): 26A918 (EXP. DATE): 1/24	pH 4 / 10 (LOT #): 26B002 (EXP. DATE): 2/24	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
700 / 700	400 / 400	☑ WITHIN RANGE	0515
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 16K001 (EXP. DATE): 11/23	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
1413 / 1413	NA	☑ WITHIN RANGE	0515
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21G100575 (EXP. DATE): 7/24	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING / STANDARD			
220 / 220	21.0	☑ WITHIN RANGE	0515
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
POST-CAL. READING /SATURATED AIR			
8.14 / 8.14	24.0	☑ WITHIN RANGE	0515
/	18.6	☐ WITHIN RANGE	0827
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): HA Mott (EXP. DATE):	(LOT #): (EXP. DATE):	CAL. RANGE	TIME
POST-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0 / 0	/	☑ WITHIN RANGE	0515
10 / 10	/	☑ WITHIN RANGE	0515
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ ______	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ ______	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS
DO not calibrating	

SIGNED [signature] 5/5/22 DATE

CHECKED BY [signature] 5-5-22 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Compliance	MODEL: YSI Pro	SAMPLER: HS ~~AW, JK, JJ~~	
PROJECT NO.: 464095.0001.0000	SERIAL #: Rental	DATE: 5/3/22	

PH CALIBRATION CHECK

pH 7 (LOT #): 26A518 (EXP. DATE): JAN 24 POST-CAL. READING / STANDARD	pH (4) 10 (LOT #): 268002 (EXP. DATE): FEB 24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.00 / 7.00	4.00 / 4.00	☒ WITHIN RANGE	625
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 165701 (EXP. DATE): OCT 22 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1413 / 1413	21.0	☒ WITHIN RANGE	6:28
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21610057S (EXP. DATE): 2026-07-20 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
223.0 / 223.0	20.9	☒ WITHIN RANGE	632
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
8.67 / 8.67	21.0	☒ WITHIN RANGE	638
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): DI (EXP. DATE): H_2O POST-CAL. READING / STANDARD	(LOT #): A1007 * (EXP. DATE): Jan 23 * POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0.00 / 0.00	100.0 / 100.0	☒ WITHIN RANGE	642
0.00 / 0.00	100.0 / 100.0	☒ WITHIN RANGE	1020
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ ______	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ ______	

NOTES

* 2nd turb cal: A1106 Jul 23

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS
turb readings high	recalibrated turb w/ new calibration solution

SIGNED: HS DATE: 5/3/22

CHECKED BY: [signature] DATE: 5-5-22

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC ~~Kern LF~~ KLF/BAP: 2022 GW Compliance	MODEL: PRO DSS	SAMPLER: ~~AW~~, JJ, ~~JK~~
PROJECT NO.:	464095.~~0000~~0001	SERIAL #: A2	DATE: 5/4/22

PH CALIBRATION CHECK

pH 7 (LOT #): ~~BA~~9118 (EXP. DATE): 1/24 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 26B003 (EXP. DATE): 2/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
700 / 700	400 / 400	☑ WITHIN RANGE	0515
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 16K021 (EXP. DATE): 11/22 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1413 / 1413	NR	☑ WITHIN RANGE	0515
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21G100577 (EXP. DATE): 7/26 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
220 / 220	21.6	☑ WITHIN RANGE	0515
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): LA mother (EXP. DATE): POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0 / 0	/	☑ WITHIN RANGE	0515
10 / 10	/	☑ WITHIN RANGE	0515
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

Do not working

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED _____ DATE 5/5/22

CHECKED BY _____ DATE 5-5-22

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	DATE: 5/2/22
PROJECT NUMBER:	464095.0001.0000	AUTHOR: ~~Andrew Whaley, Jake Krenz,~~ S. Jusso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
DE Karn Bottom Ash Pond						
DEK-MW-15002	0957		6.52	17.71		
DEK-MW-15004	0946		28.22	41.80		
DEK-MW-15005	0904		9.64	25.73		
DEK-MW-15006	0907		9.12	21.10		
DE Karn Bottom Ash Pond and Lined Impoundment						
DEK-MW-18001	0933		8.16	19.61		
DEK-MW-15003	0946		16.80	27.67		
Karn Lined Impoundment						
OW-10	1316		6.43	17.91		
OW-11	0933		22.04	25.67		
OW-12	0930		17.01	23.41		
Background						
MW-15002	0941		6.61	DNM		
MW-15008	0924		4.38	DNM		
MW-15016	0945		3.64	DNM		
MW-15019	0935		5.31	DNM		
DEKMW22004	0910		18.14	20.30		
DEK-MW 22001	0913		9.74	24.00		
DEK-MW 22003	0915		11.03	26.67		
DEKMW -22003	0940		10.40	24.46		
DEKMW 22006	0920		8.71	17.08		
DEKMW 22004	0933		9.45	22.44		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR
(E.G., 1.1 + 0.00 T/PVC).

5/5/22
SIGNED DATE

5-5-22
CHECKED DATE

REVISED 04/2019

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 5-7-22	BY: HS	DATE: 5/5/22

SAMPLE ID: OW-10 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER:

PURGING	TIME: 1329	DATE: 5-3-22	SAMPLE	TIME: 1425	DATE: 5-3-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 6.43 T/ PVC

DEPTH TO BOTTOM: NM T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 5.5 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 7.13 SU | CONDUCTIVITY: 676 umhos/cm

ORP: -154.6 mV | DO: 0.17 mg/L

TURBIDITY: 83.82 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 9.9 °C | OTHER:

COLOR: clear | ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear | FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1330	100	7.32	581	-46.7	2.92	19.52	10.0	7.10	INITIAL
1335	100	7.24	569	-58.3	0.57	12.44	9.8	7.27	.5
1340	100	7.21	586	-76.5	0.17	20.08	9.7	7.60	1
1345	100	7.18	608	-105.8	0.17	34.03	9.6	7.75	1.5
1350	100	7.15	635	-122.7	0.17	37.41	9.7	7.76	2
1355	100	7.13	663	-135.2	0.17	44.60	9.8	7.76	2.5
1400	100	7.13	675	-136.9	0.17	35.54	9.8	7.76	3
1405	100	7.12	677	-142.1	0.17	32.25	9.8	7.76	3.5
1410	100	7.12	676	-147.2	0.17	54.86	9.8	7.76	4
1415	100	7.12	676	-150.2	0.17	82.57	9.9	7.76	4.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
~~1-2~~	125mL	Plastic	A	☐ Y ☒ N	2	1L	Plastic	B	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1			C	☐ Y ☒ N	1	~~60mL~~ 40mL	↓	E	☐ Y ☒ N
1	↓		D	☐ Y ☒ N	1	~~40mL~~	↓	E	☒ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N	1	125mL	Plastic	B	☒ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5-5-22

TRC

WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Co	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW (JK) JJ DATE: 5-3-22		BY: MS	DATE: 5/5/22

SAMPLE ID: OW-10

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1420	100	7.13	677	-153.6	0.17	79.27	9.9	7.76	5
1425	100	7.13	676	-154.6	0.17	83.82	9.9	7.76	5.5

SIGNATURE: _____ DATE SIGNED: 5-5-22

REVISED 04/2019

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 5-3-22	BY: MS	DATE: 5/5/22

SAMPLE ID: OW-11 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0903	DATE: 5-3-22	SAMPLE	TIME: 0927	DATE: 5-3-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 21.98 T/ PVC

DEPTH TO BOTTOM: 25.45 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 2 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: ~~9.92~~ 9.51 SU | CONDUCTIVITY: 323.4 umhos/cm

ORP: -27.3 mV | DO: 0.64 mg/L

TURBIDITY: 7.41 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 11.4 °C | OTHER:

COLOR: clear | ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear | FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0907	100	9.55	328.6	~~-15.4~~ 5.9	2.15	10.53	11.2	22.41	INITIAL
0912	100	9.60	321.9	-9.1	0.71	11.26	11.2	22.87	.5
0917	100	9.58	323.1	-18.4	0.38	9.34	11.4	23.58	1.0
0922	100	9.56	323.6	-21.9	0.40	9.14	11.4	23.75	1.5
0927	100	9.51	323.4	-27.3	0.64	7.41	11.4	23.77	2.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	1L	Plastic	B	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			D	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5-5-22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JR) JJ	DATE: 5-3-22	BY: HS	DATE: 5/5/22

SAMPLE ID: OW-12 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1155	DATE: 5-3-22	SAMPLE	TIME: 1242	DATE: 5-3-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 17.05 T/ PVC

DEPTH TO BOTTOM: 23.44 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 17.5 ☒ LITERS ☐ GALLONS

COLOR: Orange ODOR: _____

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 7.12 SU | CONDUCTIVITY: 777 umhos/cm

ORP: -151.7 mV | DO: 0.21 mg/L

TURBIDITY: 8.05 NTU

☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 11.9 °C | OTHER: _____

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear | FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS: Field Blank Collected

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1157	300	7.15	755	-108.5	1.66	972.48	12.2	17.11	INITIAL
1202	300	7.10	769	-127.8	0.23	152.89	12.0	17.11	1.5
1207	300	7.10	786	-139.7	0.23	76.23	12.0	17.11	3
1212	300	7.10	790	-143.8	0.23	58.04	12.0	17.11	4.5
1217	300	7.10	788	-146.3	0.22	32.37	12.0	17.11	6
1222	300	7.11	787	-148.1	0.22	20.70	11.9	17.11	7.5
1227	300	7.11	784	-149.7	0.22	13.73	11.9	17.11	9
1232	300	7.11	783	-150.5	0.22	10.36	12.0	17.11	10.5
1237	300	7.11	780	-151.3	0.21	8.70	11.9	17.11	12
1242	300	7.12	777	-151.7	0.21	8.05	11.9	17.11	13.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	1L	Plastic	B	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			D	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5-5-22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW (JK) JJ	DATE: 5-7-22	BY: HS	DATE: 5/5/22

SAMPLE ID: DEK-MW-15003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1006	DATE: 5-3-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 16.77 T/ PVC

DEPTH TO BOTTOM: 27.86 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 9 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1052	DATE: 5-3-22

PH: 7.88 SU | CONDUCTIVITY: 378.7 umhos/cm

ORP: -198.2 mV | DO: 0.15 mg/L

TURBIDITY: 2.22 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.6 °C | OTHER:

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear | FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☒ DUP- KLI

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1007	200	8.01	350.7	-3.7	2.82	3.69	14.8	17.73	INITIAL
1012	200	7.49	358.2	-35.8	0.50	3.44	15.5	18.62	1
1017	200	7.58	362.3	-45.9	0.23	2.77	15.6	19.15	2
1022	200	7.65	364.5	-122.3	0.18	2.74	15.6	19.28	3
1027	200	7.80	367.8	-161.3	0.17	2.61	15.5	19.31	4
1032	200	7.83	369.7	-170.7	0.16	2.61	15.5	19.32	5
1037	200	7.87	372.3	-183.9	0.16	2.42	15.5	19.32	6
1042	200	7.90	374.7	-193.3	0.16	2.35	15.6	19.32	7
1047	200	7.90	375.7	-196.5	0.15	2.37	15.6	19.32	8
1052	200	7.88	378.7	-198.2	0.15	2.22	15.6	19.32	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	plastic	A	☐ Y ☒ N	4	1L	plastic	B	☐ Y ☒ N
2	↓	↓	B	☐ Y ☒ N	4	60mL	VOA	A	☐ Y ☒ N
2			C	☐ Y ☒ N	2	40mL	↓	E	☐ Y ☒ N
2			D	☐ Y ☒ N	2	40mL	↓	E	☒ Y ☐ N
2	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	5-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 5-3-22	BY: HS	DATE: 5/5/22

SAMPLE ID: KLI-PCS WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: NA	DATE: 5-3-22

PURGE METHOD: ~~PUMP~~ ~~PERISTALTIC PUMP~~ ~~BAILER~~

DEPTH TO WATER: NA T/ PVC

DEPTH TO BOTTOM: NA T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: NA ☐ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0735	DATE: 5-3-22

PH: 8.06 SU CONDUCTIVITY: 445.2 umhos/cm

ORP: 90.4 mV DO: 10.37 mg/L

TURBIDITY: 5.09 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 10.9 °C OTHER:

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0735	NA	8.06	445.2	90.4	10.37	5.09	10.9	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓		D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-7-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 5-3-22	BY: HS	DATE: 5/5/22

SAMPLE ID: KLI - SCS | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☒ OTHER N/A

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER N/A

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☒ OTHER Secondary collection

PURGING	TIME: N/A	DATE: 5-3-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: N/A T/ PVC

DEPTH TO BOTTOM: N/A T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: N/A ☐ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0759	DATE: 5-3-22

PH: 7.13 SU CONDUCTIVITY: 1507 umhos/cm

ORP: 70.6 mV DO: 3.10 mg/L

TURBIDITY: 0.74 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 11.3 °C OTHER: —

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0759	N/A	7.13	1507	70.6	3.10	0.74	11.3	N/A	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	1L	Plastic	B	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	21	40mL	VOA	E	☐ Y ☒ N
1			C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1	↓		D	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	5-5-22

REVISED 04/2019

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK JJ	DATE: 5-3-22	BY: HS	DATE: 5/5/22

SAMPLE ID: SW-Ditch | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: NA	DATE: 5-3-22	SAMPLE	TIME: 0825	DATE: 5-3-22

PURGE METHOD: ~~PUMP~~ ~~PERISTALTIC PUMP~~ ~~BAILER~~

DEPTH TO WATER: NA T/ PVC

DEPTH TO BOTTOM: NA T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: NA ☐ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 8.65 SU | CONDUCTIVITY: 492.0 umhos/cm

ORP: 38.0 mV | DO: 8.74 mg/L

TURBIDITY: 14.74 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.6 °C | OTHER:

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear | FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0825	NA	8.65	492.0	38.0	8.74	14.74	15.6	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	2	60mL	VOA	A	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓	↓	D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5-5-22

TRC BAP/LI WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~LF~~ 2022 GW Comp	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0000.0000 0001	BY: ~~AW~~ JJ ~~JK~~	DATE: 5/5/22	BY: JK	DATE: 5-5-22

SAMPLE ID: DEK-MW-18001	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER	
WELL MATERIAL:	☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE	☐ OTHER

PURGING	TIME: 1314	DATE: 5/3/22	SAMPLE	TIME: 1344	DATE: 5/3/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.59 SU	CONDUCTIVITY: 983	umhos/cm
			ORP: -76.3 mV	DO: NM	mg/L
DEPTH TO WATER: 8.10 T/ PVC			TURBIDITY: 4.90 NTU		
DEPTH TO BOTTOM: 19.61 T/ PVC			☑ ~~NONE~~ ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 9.6 °C	OTHER:	
VOLUME REMOVED: 6 ☑ ~~LITERS~~ ☐ GALLONS			COLOR: clear	ODOR: none	
COLOR: cloudy ODOR: none			FILTRATE (0.45 um) ☑ ~~YES~~ ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR:	
☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			QC SAMPLE: ☑ ~~MS/MSD~~ ☐ DUP-		
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS: DO networking		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1314	200	8.17	493	47.0	NM	65.0	11.0	8.0	INITIAL
1319		7.61	988	-8.1		28.3	9.6	8.15	1
1324		7.55	986	-42.0		13.0	9.6	8.15	2
1329		7.58	986	-65		11.0	9.6	8.15	3
1334		7.58	984	-75.8		5.0	9.6	8.15	4
1339		7.59	983	-76.0		5.0	9.6	8.1	5
1344		7.54	983	-76.3		4.90	9.6	8.15	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
6	125	G/ASS	A	☐ Y ☑ ~~N~~	3	125	PL	B	☐ Y ☑ ~~N~~
3	40	G/ASS	E	☐ Y ☑ ~~N~~	3	125	PL	C	☐ Y ☑ ~~N~~
3	40	G/ASS	E	☑ ~~Y~~ ☐ N	3	125	PL	D	☐ Y ☑ ~~N~~
1	250	PL	A	☐ Y ☑ ~~N~~					☐ Y ☐ N
3	125	PL	A	☐ Y ☑ ~~N~~					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5-3-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/5/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JW~~ MS	DATE: 5/3/22	BY: JK	DATE: 5-5-22

SAMPLE ID: DUP-MW-15002 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1336	DATE: 5/3/22	SAMPLE	TIME: 1421	DATE: 5/3/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: ~~7.12~~ 6.99 SU	CONDUCTIVITY: 884 umhos/cm	
			ORP: -95.3 mV	DO: 0.01 mg/L	
DEPTH TO WATER: 6.45 T/ PVC			TURBIDITY: 3.78 NTU		
DEPTH TO BOTTOM: 15.74 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 8.9 °C	OTHER: —	
VOLUME REMOVED: 0 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: clear ODOR: none			FILTRATE (0.45 um) ☒ YES ~~☐~~ NO (MS)		
TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY			FILTRATE COLOR: clear	FILTRATE ODOR: none	
			QC SAMPLE: ☐ MS/MSD	☐ DUP- —	
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS: —		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1336	200	6.98	913	110.0	2.16	41.12	8.6	6.45	INITIAL
1341	200	7.01	912	84.7	0.38	24.27	8.7	6.72	1
1346	200	7.02	905	46.1	0.18	15.01	8.7	6.73	2
1351	200	7.01	900	6.0	0.09	10.60	8.7	6.73	3
1356	200	7.00	896	-33.6	0.03	9.99	8.8	6.78	4
1401	200	7.00	894	-67.9	0.01	7.50	8.8	6.78	5
1406	200	7.00	891	-76.5	0.01	6.13	8.8	6.78	6
1411	200	6.99	888	-85.6	0.01	4.13	9.0	6.78	7
1416	200	6.99	885	-91.8	0.01	3.12	9.0	6.78	8
1421	200	6.99	884	-95.3	0.01	3.78	8.9	6.78	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N	2	80	VOA	A	☐ Y ☒ N
1	150	plastic	A	☐ Y ☒ N	1	40	VOA	E	☒ Y ☐ N
1	150	plastic	D+ZnAc	☐ Y ☒ N	1	40	VOA	E	☐ Y ☒ N
1	150	plastic	C	☐ Y ☒ N					☐ Y ☐ N
1	150	plastic	B	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5/3/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	MS	DATE SIGNED:	5/5/22

TRC

WATER SAMPLE LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED
PROJECT NUMBER: 464095.0001.0000	BY: ~~AW, JK, JJ~~ HS	DATE: 5/3/22	BY: JK DATE: 5-5-22

SAMPLE ID: DEK- MW-15005 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING		SAMPLE	
TIME: 1216	DATE: 5/3/22	TIME: 1256	DATE: 5/3/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP; ☐ BAILER		PH: 7.14 SU	CONDUCTIVITY: 1036 umhos/cm
		ORP: -101.0 mV	DO: 0.02 mg/L
DEPTH TO WATER: 9.39 T/ PVC		TURBIDITY: 4.35 NTU	
DEPTH TO BOTTOM: 22.30 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY	
WELL VOLUME: NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 9.6 °C	OTHER:
VOLUME REMOVED: 8 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none
COLOR: Clearish	ODOR: none	FILTRATE (0.45 um) ☒ YES ~~☒~~ NO HS	
TURBIDITY		FILTRATE COLOR: Clear	FILTRATE ODOR: none
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY		QC SAMPLE: ☐ MS/MSD	☐ DUP- —
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER		COMMENTS: —	

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1216	200	6.70	1142	164.1	1.20	16.03	9.5	9.39	INITIAL
1221	200	7.00	1105	85.6	0.46	11.03	9.6	9.51	1
1226	200	7.08	1073	21.0	0.20	9.67	9.6	9.52	2
1231	200	7.11	1059	-22.2	0.13	7.59	9.6	9.53	3
1236	200	7.12	1056	-72.8	0.05	5.79	9.6	9.49	4
1241	200	7.13	1049	-85.2	0.03	5.56	9.6	9.49	5
1246	200	7.14	1033	-93.0	0.01	5.75	9.6	9.48	6
1251	200	7.14	1030	-97.7	0.01	4.67	9.6	9.48	7
1256	200	7.14	1036	-101.0	0.02	4.35	9.6	9.49	8

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ______

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N	2	80	VOA	A	☐ Y ☒ N
1	150	plastic	A	☐ Y ☒ N	1	40	VOA	E	☒ Y ☐ N
1	250	plastic	D+ZnAc	☐ Y ☒ N	1	40	VOA	E	☐ Y ☒ N
1	150	plastic	C	☐ Y ☒ N					☐ Y ☐ N
1	150	plastic	B	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: FedEx	DATE SHIPPED: 5/3/22	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE: HS	DATE SIGNED: 5/5/22

REVISED 04/2019

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JJ~~ HS	DATE: 5/3/22	BY: JK	DATE: 5-5-22

SAMPLE ID: DEK-MW-15006 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1027	DATE: 5/3/22	SAMPLE	TIME: 1042	DATE: 5/3/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.38 SU	CONDUCTIVITY: 713 umhos/cm	
			ORP: -75.5 mV	DO: 0.12 mg/L	
DEPTH TO WATER: 8.93 T/ PVC			TURBIDITY: 2.06 NTU		
DEPTH TO BOTTOM: 21.82 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 10.2 °C	OTHER: —	
VOLUME REMOVED: 3 ☒ LITERS ☐ GALLONS			COLOR: clear	ODOR: none	
COLOR: Clear ish	ODOR: none		FILTRATE (0.45 um) ☒ YES ☐ NO (LJ)		
TURBIDITY			FILTRATE COLOR: Clear	FILTRATE ODOR: none	
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☒ DUP- DEK-BAP-01		
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS: FB + EB taken w/ new sampler		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1027	200	7.33	717	-42.4	1.66	4.39	10.2	8.93	INITIAL
1032	200	7.36	708	-74.2	0.17	4.13	10.2	9.01	~~200~~ 1
1037	200	7.37	708	-75.0	0.10	2.62	10.2	9.01	2
1042	200	7.38	713	-75.5	0.12	2.06	10.2	9.02	3

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

~~NUMBER~~	~~SIZE~~	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
250	2	Plastic	A	☐ Y ☒ N	4	40	VOA	E	☒ Y ☐ N
500	4	plastic	A	☐ Y ☒ N	4	40	VOA	E	☐ Y ☒ N
150	4	plastic	D + ZnAc	☐ Y ☒ N	4	80	VOA	A	☐ Y ☒ N
150	4	plastic	C	☐ Y ☒ N					☐ Y ☐ N
150	4	plastic	B	☐ Y ☒ N					☐ Y ☐ N

5.2e

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5/3/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	HS	DATE SIGNED:	5/3/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JJ~~ HS	DATE: 5/2/22	BY: SK	DATE: 5-8-22

SAMPLE ID: MW-15002	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER			
WELL MATERIAL:	☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER		
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI	☐ LEACHATE	☐ OTHER	

PURGING	TIME: 1555	DATE: 5/4/22	SAMPLE	TIME: 1724	DATE: 5/2/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.50 SU	CONDUCTIVITY: 5917 umhos/cm	
			ORP: -49.7 mV	DO: 0.00 mg/L	
DEPTH TO WATER: 6.72 T/ PVC			TURBIDITY: 9.97 NTU		
DEPTH TO BOTTOM: 16.89 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 9.2 °C	OTHER:	
VOLUME REMOVED: 18 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: Slight	
COLOR: Clear w/ rust colored flakes	ODOR: None		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR: —	FILTRATE ODOR: —	
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP- —	
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1555	200	7.34	862	56.8	4.01	5.10	9.5	6.72	INITIAL
1600	200	6.89	1367	16.7	1.55	5.61	9.2	6.93	1
1605	200	6.62	2501	-20.9	1.09	5.75	9.2	6.99	2
1610	200	6.59	2987	-31.6	0.99	5.63	9.1	7.05	3
1615	200	6.58	3156	-34.0	0.95	5.38	9.1	7.06	4
1620	200	6.56	3441	-36.1	0.78	5.10	9.1	7.05	5
1625	200	6.54	3843	-39.6	0.61	4.19	9.2	7.04	6
1630	200	6.54	4025	-40.9	0.52	4.12	9.2	7.04	7
1635	200	6.54	4093	-42.3	0.46	4.40	9.1	7.07	8
1640	200	6.53	4205	-43.3	0.32	4.92	9.1	7.09	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N					☐ Y ☐ N
1	100	↓	A	☐ Y ☒ N					☐ Y ☐ N
1	100	↓	B	☐ Y ☒ N					☐ Y ☐ N
2	1000	↓	B	☐ Y ☒ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	5/3/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	HS	DATE SIGNED:	5/5/22

TRC WATER SAMPLE LOG (CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Co	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW~~, JK, JJ	DATE:	BY: JK	DATE: ~~5-5-22~~

HS 5/2/22

SAMPLE ID: MW-5002

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1645	200	6.53	4480	-44.3	0.23	4.94	9.0	7.09	10
1650	200	6.52	4652	-43.3	0.17	4.23	9.0	7.09	11
1655	200	6.42	4699	-48.0	0.07	3.87	9.1	7.14	12
1800	200	6.50	4851	-48.9	0.01	4.91	9.0	7.14	13
1805	200	6.51	4962	-49.8	0.01	8.42	9.0	7.15	14
1810	200	6.51	5110	-50.8	0.00	10.00	9.1	7.15	15
1815	200	6.50	5465	-51.3	0.00	10.00	9.2	7.15	16
1818	200	6.49	5853	-48.7	0.00	9.28	9.3	7.15	17
1821	200	6.49	5974	-49.5	0.02	9.93	9.4	7.15	17.5
1824	200	6.50	5911	-49.7	0.00	9.97	9.2	7.15	18

SIGNATURE: HS DATE SIGNED: 5/2/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JJ~~ HS	DATE: 5/2/22	BY: SR	DATE: 5-5-22

SAMPLE ID: MW-15008 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1305	DATE: 5/2/22	SAMPLE	TIME: 1345	DATE: 5/2/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 4.33 T/ PVC

DEPTH TO BOTTOM: 17.43 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 8 ☒ LITERS ☐ GALLONS

COLOR: Clear w/ rust flakes ODOR: none

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 6.39 SU | CONDUCTIVITY: 1.347 umhos/cm

ORP: -73.2 mV | DO: ~~0.09~~ 0.05 mg/L

TURBIDITY: 9.52 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 8.5 °C | OTHER: —

COLOR: Clear | ODOR: none

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: — | FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☒ DUP- _____

COMMENTS: Field blank

TIME	PURGE RATE (ML/MIN)	PH (SU)	~~CONDUCTIVITY~~ SPC* (~~umhos/cm~~)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1315	200	6.39	1.438	-15.9	1.65	19.80	8.7	4.35	~~INITIAL~~ 2L
1320	200	6.36	1.418	-47.8	0.27	12.43	8.4	4.36	3
1325	200	6.35	1.391	-57.5	0.12	15.10	8.5	4.36	4
1330	200	6.37	1.367	-65.5	0.01	14.20	8.4	4.38	5
1335	200	6.38	1.348	-69.4	~~0.02~~ 0.04	9.57	8.3	4.39	6
1340	200	6.39	1.352	-71.4	~~0.03~~ 0.07	9.07	8.3	4.48	7
1345	200	6.39	1.347	-73.2	~~0.05~~ 0.09	9.52	8.5	4.48	8
			* mS/cm						

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250	plastic	A	☐ Y ☒ N					☐ Y ☐ N
2	100	glass	A	☐ Y ☒ N					☐ Y ☐ N
2	100	plastic	B	☐ Y ☒ N					☐ Y ☐ N
1	100	plastic	B	☐ Y ☒ N					☐ Y ☐ N
6	1000	plastic	B	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD: FedEx	DATE SHIPPED: 5/3/22	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE: HS	DATE SIGNED: 5/5/22

Note: SPC, not conductivity

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JJ~~ AS	DATE: 5/3/22	BY: JC	DATE: 5-8-22

SAMPLE ID: MW-15016 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 737	DATE: 5/3/22	SAMPLE	TIME: 837	DATE: 5/3/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 6.66 SU	CONDUCTIVITY: 1390 umhos/cm	
			ORP: -84.0 mV	DO: 0.05 mg/L	
DEPTH TO WATER: 3.62 T/ PVC			TURBIDITY: 10.00 NTU		
DEPTH TO BOTTOM: 8.01 T/ PVC			☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 8.1 °C	OTHER:	
VOLUME REMOVED: 12 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: clear ODOR: Slight			FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR: —	FILTRATE ODOR: —	
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP- —	
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS: —		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
737	200	6.98	1367	69.5	2.07	37.51	8.0	3.62	INITIAL
742	200	6.68	1403	-29.9	0.71	18.24	8.0	3.78	1
747	200	6.66	1455	-54.6	0.41	50.31	8.0	3.77	2
752	200	6.66	1485	-63.9	0.25	47.71	8.0	3.78	3
757	200	6.66	1484	-68.3	0.17	39.48	8.0	3.79	4
802	200	6.66	1466	-72.8	0.09	24.20	8.0	3.81	5
807	200	6.66	1452	-75.2	0.05	19.02	8.0	3.84	6
812	200	6.66	1439	-72.5	0.02	16.50	8.0	3.82	7
817	200	6.66	1438	-78.3	0.01	12.59	8.0	3.81	8
822	200	6.66	1409	-81.5	0.01	12.43	8.0	3.81	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N					☐ Y ☐ N
1	100	plastic	A	☐ Y ☒ N					☐ Y ☐ N
1	100	plastic	B	☐ Y ☒ N					☐ Y ☐ N
2	1000	plastic	B	☐ Y ☒ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	5/3/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	HJ	DATE SIGNED:	5/5/22

TRC

WATER SAMPLE LOG

(CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Co	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JJ~~	DATE:	BY: JK	DATE: 5-5-22

HS 5/3/22

SAMPLE ID: MW-15016

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
827	200	6.66	1417	-82.3	0.01	9.97	8.1	3.81	10
832	200	6.66	1401	-82.8	0.01	9.99	8.1	3.81	11
837	200	6.66	1390	-84.0	0.01	10.00	8.1	3.81	12

SIGNATURE: HS

DATE SIGNED: 5/3/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: HS ~~AW, JK, JJ~~	DATE: 5/3/22	BY: JK	DATE: 5-5-22

SAMPLE ID: MW-1501S | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING		SAMPLE	
TIME: ~~1440~~ 1500 (HS)	DATE: 5/3/22	TIME: ~~1440~~ 1520	DATE: 5/3/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.49 SU	CONDUCTIVITY: 1414 umhos/cm
		ORP: -71.1 mV	DO: 0.01 mg/L
DEPTH TO WATER: ~~5.00~~ T/ PVC 5.38 (HS)		TURBIDITY: 4.03 NTU	
DEPTH TO BOTTOM: ~~17.79~~ T/ PVC 16.88		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY	
WELL VOLUME: NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 7.3 °C	OTHER: —
VOLUME REMOVED: 4 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none
COLOR: Clear ~~Tan~~	ODOR: none	FILTRATE (0.45 um) ☐ YES ☒ NO	
(HS) TURBIDITY		FILTRATE COLOR: —	FILTRATE ODOR: —
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY		QC SAMPLE: ☐ MS/MSD	☐ DUP- —
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER		COMMENTS: —	

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1500	200	6.73	1473	7.5	3.23	3.15	7.8	5.00	INITIAL
1505	200	6.54	1449	-49.2	0.01	3.58	7.5	5.42	1L
1510	200	6.49	1418	-65.2	0.02	3.80	7.4	5.45	2
1515	200	6.49	1423	-67.0	0.04	3.79	7.4	5.43	3
1520	200	6.49	1414	-71.1	0.01	4.03	7.3	5.44	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	250	plastic	A	☐ Y ☐ N					☐ Y ☐ N
1	100	↓	A	☐ Y ☐ N					☐ Y ☐ N
1	100		B	☐ Y ☐ N					☐ Y ☐ N
2	1000		B	☐ Y ☐ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	5/3/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	MS	DATE SIGNED:	5/5/22

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn ~~LF~~ BAP/LF 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: 464095.~~0000~~0001	BY: ~~AW~~, BJ ~~JK~~ DATE: 5/5/22	BY: JK DATE: 5-5-22

SAMPLE ID: DEK-MW-15 Dup	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER
SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE	☐ OTHER

PURGING	TIME: 0748	DATE: 5/4/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER		
DEPTH TO WATER: 28.35 T/ PVC		
DEPTH TO BOTTOM: 41.80 T/ PVC		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS		
VOLUME REMOVED: 9 ☒ ~~LITERS~~ ☐ GALLONS		
COLOR: Black	ODOR: Slight	
TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ ~~VERY~~		
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER		

SAMPLE	TIME: 0838	DATE: 5/4/22
PH: 7.30 SU	CONDUCTIVITY: 1068 umhos/cm	
ORP: -94.0 mV	DO: NM mg/L	
TURBIDITY: 60 NTU		
☒ ~~NONE~~ ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: Clear °C	OTHER:	
COLOR: Clear	ODOR: non	
FILTRATE (0.45 um) ☐ YES ☐ NO		
FILTRATE COLOR: Clear	FILTRATE ODOR: non	
QC SAMPLE: ☐ MS/MSD ☒ DUP- ~~#1~~ DEK-BAP-02		
COMMENTS: Do not working		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0748	200	7.17	5350	19.1		1912	9.4	28.28	INITIAL
0753		7.24	1077	-75.1		689	12.3	2845	1
0758		7.26	1077	-84.0		21.6	12.5	2841	2
0803		7.29	1075	-95.0		12.0	12.6	2841	3
0808		7.29	1073	-95.3		12.0	12.6	2841	4
0813		7.30	1072	-95.8		6.0	12.6	2841	5
0818		7.30	1070	-99.0		6.0	12.6	2845	6
0823		7.30	1066	-99.5		6.0	12.6	2841	7
0828		7.30	1068	-99.0		6.0	12.6	2841	8
~~0833~~								~~2841~~	~~9~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	125	glass	A	☐ Y ☒ ~~N~~	2	125	PL	B	☐ Y ☒ ~~N~~
2	40	glass	E	☐ Y ☒ ~~N~~	2	125	PL	C	☐ Y ☒ N
2	40	glass	E	☒ Y ☐ N	2	125	PL	D	☐ Y ☒ ~~N~~
2	250	PL	A	☐ Y ☒ ~~N~~					☐ Y ☐ N
2	125	PL	A	☐ Y ☒ ~~N~~					☐ Y ☐ N

SHIPPING METHOD: lab drop off	DATE SHIPPED: 5-5-22	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 5/5/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~LF~~ BAP/LI 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER:	464095.0000.0000 0001	BY: AW, JJ, JK DATE: 5/3/22	BY: JK DATE: 5-5-22

SAMPLE ID: DEKMW 22003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0905	DATE: 5/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 11.03 T/ PVC

DEPTH TO BOTTOM: 26.67 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 8 ☒ LITERS ☐ GALLONS

COLOR: Brown ODOR: non

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0945	DATE: 5/4/22

PH: 7.30 SU | CONDUCTIVITY: 1594 umhos/cm

ORP: -74.9 mV | DO: NM mg/L

TURBIDITY: 14.90 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 9.9 °C | OTHER:

COLOR: Clear | ODOR: non

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear | FILTRATE ODOR: non

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS: Do not work in

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0905	200	7.33	1621	-10.1	NM	2300	9.0	11.10	INITIAL
0910		7.32	1598	-33.7		16.00	9.7	11.30	1.6
0915		7.27	1600	-37.0		98	9.8	11.35	2
0920		7.27	1601	-55.0		31	9.9	11.35	3.0
0925		7.30	1598	-63.5		46.0	9.9	11.35	4
0930		7.29	1596	-63.4		46.0	9.9	11.35	5.0
0935		7.30	1594	-75.0		15.0	9.9	11.35	6.0
0940		7.30	1594	-74.8		15.0	9.9	11.35	7.0
0945		7.30	1594	-74.9		14.90	9.9	11.35	8

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☒ N	1	125	PL	B	☐ Y ☒ N
1	40	glass	E	☐ Y ☒ N	1	125	PL	C	☐ Y ☒ N
1	40	glass	F	☒ Y ☐ N	1	125	PL	D	☐ Y ☒ N
1	250	PL	A	☐ Y ☒ N					☐ Y ☐ N
1	125	PL	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	lab drop off	DATE SHIPPED:	5-5-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	5/5/22

WATER SAMPLE LOG

PROJECT NAME: CEC Karn ~~LF~~ GAP/LI: 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: 464095.~~0000~~0001.0000	BY: ~~AW~~ JJ ~~JK~~ DATE: 5/5/22	BY: JK DATE: 5-5-22

SAMPLE ID: OFKMW 22003 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1017	DATE: 5/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 10.46 T/ PVC

DEPTH TO BOTTOM: 24.46 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 7 ☒ LITERS ☐ GALLONS

COLOR: Brn Arg ODOR: non

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1052	DATE: 5/4/22

PH: 7.35 SU — CONDUCTIVITY: 2428 umhos/cm

ORP: -96.2 mV — DO: NM mg/L

TURBIDITY: 52.0 NTU

☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY

TEMPERATURE: 9.7 °C — OTHER:

COLOR: cloudy — ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear — FILTRATE ODOR: non

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS: DO not workin

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1017	200	7.28	6497	15.0	NM	2350	10.3	10.53	INITIAL
1022		7.31	2640	-74.7		54.0	9.9	10.55	1
1027		7.31	2603	-90.0		52.0	9.8	10.55	2
1032		7.33	2529	-90.8		36.0	9.9	10.55	3
1037		7.34	2485	-92.0		57.0	9.8	10.55	4
1042		7.35	2459	-95.8		54.6	9.7	10.55	5
1047		7.35	2436	-96.0		57.0	9.7	10.55	6
1052		7.35	2428	-96.2		57.0	9.7	10.55	7
~~1057~~								~~10.55~~	~~8~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☒ N	1	125	PL	B	☐ Y ☒ N
1	40	glass	E	☐ Y ☒ N	1	125	PL	C	☐ Y ☒ N
1	40	glass	E	☒ Y ☐ N	1	125	PL	D	☐ Y ☒ N
1	250	PL	A	☐ Y ☒ N					☐ Y ☐ N
1	125	PL	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: lab Drop off — DATE SHIPPED: 5-5-22 — AIRBILL NUMBER: —

COC NUMBER: — SIGNATURE: — DATE SIGNED: 5/5/22

TRC

WATER SAMPLE LOG

PROJECT NAME: CEC Karn ~~LF~~ BAP/LI 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: 464095.~~0000~~ 0001	BY: ~~AW~~ JJ ~~JK~~ DATE: 5/5/22	BY: JK DATE: 5-5-22

SAMPLE ID: DEKMW 22001	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER	
WELL MATERIAL:	☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE	☐ OTHER

PURGING	TIME: 1115	DATE: 5/4/22	SAMPLE	TIME: 1155	DATE: 5/4/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.31 SU	CONDUCTIVITY: 1824 umhos/cm	
			ORP: -66.0 mV	DO: NM mg/L	
DEPTH TO WATER: 9.74 T/ PVC			TURBIDITY: 19.3 NTU		
DEPTH TO BOTTOM: 24.6 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 9.9 °C	OTHER:	
VOLUME REMOVED: 9 ☑ LITERS ☐ GALLONS			COLOR: clear	ODOR: non	
COLOR: Brown	ODOR: none		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR: non	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS: DO not working		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1115	200	7.71	1831	-14.0	NM	69.1	10.1	9.72	INITIAL
1120		7.25	1810	-23.0		99.0	9.7	9.78	1
1125		7.21	1819	-34.1		67.0	9.8	9.78	2
1130		7.24	1823	-45.0		45.0	9.9	9.78	3
1135		7.28	1825	-55.0		37.0	9.8	9.78	4
1140		7.29	1822	-55.8		29.0	9.9	9.78	5
1145		7.31	1824	-65.8		20.0	9.9	9.78	6
1150		7.31	1822	-69.9		19.6	9.9	9.78	7
1155		7.31	1824	-66.0	↓	19.3	9.9	9.78	8
~~1200~~								~~9.78~~	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____							
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☑ N	1	125	PL	B	☐ Y ☑ N
1	40	glass	E	☑ Y ☐ N	1	125	PL	C	☐ Y ☑ N
1	40	glass	E	☐ Y ☑ N	1	125	PL	D	☐ Y ☑ N
1	250	PL	A	☐ Y ☒ N					☐ Y ☐ N
1	125	PL	A	☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD: Lab Drop off	DATE SHIPPED: 5-5-22	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 5/5/22

TRC

WATER SAMPLE LOG

PROJECT NAME: CEC Karn ~~LF~~ BAP/LI 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: 464095.0000.0001	BY: ~~AW~~ JK DATE: 5/5/22	BY: JK DATE: 5-5-22

SAMPLE ID: DEKMW 22005 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1215	DATE: 5/4/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER	
DEPTH TO WATER:	8.19 T/ PVC	
DEPTH TO BOTTOM:	20.30 T/ PVC	
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS	
VOLUME REMOVED:	9 ☑ LITERS ☐ GALLONS	
COLOR:	Brown ODOR: non	
TURBIDITY	☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER	

SAMPLE	TIME: 1300	DATE: 5/4/22
PH: 7.62 SU	CONDUCTIVITY: 1321 umhos/cm	
ORP: -95.8 mV	DO: NM mg/L	
TURBIDITY: 10.0 NTU		
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 9.2 °C	OTHER:	
COLOR: clear	ODOR: none	
FILTRATE (0.45 um) ☑ YES ☐ NO		
FILTRATE COLOR: clear	FILTRATE ODOR: none	
QC SAMPLE: ☐ MS/MSD ☐ DUP-		
COMMENTS: DO not working		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1215	200	7.79	1486	19.6	NM	86.0	10.4	8.19	INITIAL
1220		7.51	1414	-53.5		92.0	9.2	8.20	1
1225		7.50	1397	-70.1		154	9.5	8.20	2
1230		7.54	1374	-75.3		1290	9.3	8.20	3
1235		7.56	1356	-85.0		52.0	9.2	8.20	4
1240		7.60	1344	-85.0		24.0	9.2	8.20	5
1245		7.60	1331	-95.0		15.0	9.2	8.20	6
1250		7.61	1324	-95.3		10.0	9.2	8.20	7
1255		7.62	1322	-95.3		10.0	9.2	8.20	8
1300		7.62	1321	-95.8		10.0	9.2	8.20	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	40	glass	A	☐ Y ☑ N	1	1L	PL	B	☐ Y ☑ N
1	40	glass	E	☐ Y ☑ N	1	1L	PL	C	☐ Y ☑ N
1	40	glass	E	☑ Y ☐ N	1	1L	PL	D	☐ Y ☑ N
1	250	PL	A	☐ Y ☑ N					☐ Y ☐ N
1	1L	PL	A	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD: lab Drop off	DATE SHIPPED: 5-5-22	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 5/5/22

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn ~~LF~~ BAP/LF: 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: 464095.~~0000~~ 0001	BY: ~~AW~~ JJ ~~JK~~ DATE: 5/5/22	BY: SK DATE: 5-5-22

SAMPLE ID: DEKMW-2004	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER	
WELL MATERIAL:	☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER
SAMPLE TYPE:	☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE	☐ OTHER

PURGING	TIME: 1315	DATE: 5/4/22	SAMPLE	TIME: 1400	DATE: 5/4/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.61 SU	CONDUCTIVITY: 1046 umhos/cm	
			ORP: -66.9 mV	DO: NM mg/L	
DEPTH TO WATER: 9.45 T/ PVC			TURBIDITY: 5 NTU		
DEPTH TO BOTTOM: 22.44 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 9.7 °C	OTHER:	
VOLUME REMOVED: 6 ☑ LITERS ☐ GALLONS			COLOR: clear	ODOR: nor	
COLOR: Brown	ODOR: nor		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR: nor	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS: DO not working		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1315	200	7.77	1116	-46	NM	4000	10.4	9.57	INITIAL
1330		7.59	1128	-54.4		1276	10.0	9.62	1
1335		7.58	1120	-64.0		695.0	9.7	9.60	2
1340		7.59	1123	-70.0		57	9.9	9.62	3
1345		7.60	1094	-74.2		146	9.9	9.62	4
1350		7.63	1068	-75.0		27	9.8	9.62	5
1345		7.63	1067	-77.		20.	9.7	9.62	6
1355		7.66	1048	-80.0		5	9.8	9.62	7
1355		7.65	1047	-82.0		5	9.7	9.62	8
1400		7.65	1046	-66.9	↓	5	9.7	9.62	9

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☑ N	1	125	PL	B	☐ Y ☑ N
1	40	glass	E	☑ Y ☐ N	1	125	PL	C	☐ Y ☑ N
1	40	glass	E	☐ Y ☑ N	1	125	PL	D	☐ Y ☑ N
1	250	PL	A	☐ Y ☑ N					☐ Y ☐ N
1	125	PL	A	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD: lab drop off	DATE SHIPPED: 5-5-22	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 5/5/22

WATER SAMPLE LOG

PROJECT NAME: CEC Karn ~~LF~~ BAP/LZ 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER: 464095.~~0000~~0001	BY: ~~AW~~ JJ ~~dK~~ DATE: 4/30/22	BY: JK DATE: 5-5-22

SAMPLE ID: DEKMW-22006	WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER				
WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL	☐ OTHER				
SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE	☐ OTHER				

PURGING	TIME: 1415	DATE: 5/4/22	SAMPLE	TIME: 1430	DATE: 5/4/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.64 SU	CONDUCTIVITY: 3009 umhos/cm	
			ORP: -100.1 mV	DO: ~~X~~ mg/L	
DEPTH TO WATER: 8.71 T/ PVC			TURBIDITY: 2.2 NTU		
DEPTH TO BOTTOM: 17.08 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 8.6 °C	OTHER:	
VOLUME REMOVED: 3 ☑ LITERS ☐ GALLONS			COLOR: clear	ODOR: nor	
COLOR: Clear	ODOR: none		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY ☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			FILTRATE COLOR: clear	FILTRATE ODOR: nor	
			QC SAMPLE: ☐ MS/MSD	☐ DUP-	
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS: DO not working		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1415	200	7.87	1185	7.7	NM	25	11.7	8.79	INITIAL
1430	↓	7.63	2987	-99.5		3	86	895	1
1435		7.64	3001	-100		2.95	8.6	895	2
1436	↓	7.64	3009	-100.5	↓	2.80	8.6	891	3
~~1437~~								~~894~~	~~4~~
~~1446~~								~~894~~	~~5~~
~~1445~~								~~894~~	~~6~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____								
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1L	G/M	A	☐ Y ☑ N		1	1L	P1	B	☐ Y ☑ N
1	HC	G/AG	E	☑ Y ☐ N		1	1L	P1	C	☐ Y ☑ N
1	HC	G/AG	E	☐ Y ☑ N		1	1L	P1	D	☐ Y ☑ N
1	250	P1	A	☐ Y ☑ N						☐ Y ☐ N
1	1L	P1	A	☐ Y ☑ N						☐ Y ☐ N

SHIPPING METHOD: lab Drop off	DATE SHIPPED: 5-5-22	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 5/5/22

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SAMPLING SITE / CUSTOMER: Q2-2022 JCW-DEK Background Wells

PROJECT NUMBER: 22-0443

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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
22-0443-01	5/2/22	1724	GW	MW-15002	4	3	1						x	x	x	
-02	5/2/22	1345	GW	MW-15008	4	3	1						x	x	x	
-03	5/3/22	837	GW	MW-15016	4	3	1						x	x	x	
-04	5/4/22	1520	GW	MW-15019	4	3	1						x	x	x	
-05	5/2/22	—	GW	DUP-Background	4	3	1						x	x	x	
-06	5/2/22	1345	W	FB- Background	1								x			

RELINQUISHED BY: Harold Register — DATE/TIME: 5/3/22 — RECEIVED BY: FedEx

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

COMMENTS:

Received on Ice? ☐ Yes ☐ No M&TE # _____

Temperature _____ °C Cal Due Date _____

Checked by: HS 5/5/22

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Page ____ of ____

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Bottom Ash Pond Wells

PROJECT NUMBER: 22-0436

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: Henry Schmidt, Jake Kienz, Javier Jaime

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0436-01	5/3/22	1421	GW	DEK-MW-15002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02		1256	GW	DEK-MW-15005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03		1042	GW	DEK-MW-15006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04		—	GW	DUP-DEK-BAP-01	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05		1042	W	FB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	
-06		1042	W	EB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	

ANALYSIS REQUESTED (Attach List if More Space is Needed)

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

RELINQUISHED BY: Henry Schmidt — DATE/TIME: 5/3/22 — RECEIVED BY: FedEx

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

COMMENTS:

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

Temperature: _____ °C — Cal. Due Date: _____

Checked by KS 5/5/22

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Page _____ of _____

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0438

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	Dissolved Metals	REMARKS
22-0438-01	5-3-22	1052	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-02		1425	GW	OW-10	9	4	1	1	1	2			x	x	x	x	x	x	x	x	x	
-03		0927	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-04		1242	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-05		0759	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-06		0735	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-07		0825	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-08		—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-09		1305	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		
-10		1242	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		

RELINQUISHED BY: [signature] DATE/TIME: 5-7-22/1530 RECEIVED BY: Fedex

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

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

Temperature: _____ °C Cal. Due Date: _____

Checked by PS 5/5/22

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Page 1 of 1

pg 42 of 48

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Bottom Ash Pond & Lined Impound.	PROJECT NUMBER: 22-0437	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER	REQUESTER: Harold Register	
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register; TRC	MATRIX CODES: GW = Groundwater, WW = Wastewater, W = Water / Aqueous Liquid, S = Soil / General Solid, O = Oil, OX = Other, SL = Sludge, A = Air, WP = Wipe, WT = General Waste		

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon		REMARKS
22-0437-01	5/3/22	1344	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-02	"	1344	GW	DEK-MW-18001 MS	8	3	1	1	1	2			x	x	x		x	x	x	x		
-03	"	1344	GW	DEK-MW-18001 MSD	8	3	1	1	1	2			x	x	x		x	x	x	x		

ANALYSIS REQUESTED (Attach List if More Space is Needed)

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

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
	5/3/22 1430	Fed Ex
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
Fed Ex	05-04-22 10:25	

COMMENTS:

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

Temperature: 1.2-1.6 °C Cal. Due Date: 6-3-22

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SAMPLING SITE / CUSTOMER: Q2-2022 DEK Bottom Ash Supplemental

PROJECT NUMBER: 22-0439

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Orgnic Carbon	REMARKS
22-0439-01	5/4/22	0820	GW	DEK-MW-15004	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	5/4/22	1115	GW	DEK-MW-22001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	5/4/22	0945	GW	DEK-MW-22002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	5/4/22	1055	GW	DEK-MW-22003	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	5/4/22	1400	GW	DEK-MW-22004	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-06	5/4/22	1300	GW	DEK-MW-22005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-07	5/4/22	1430	GW	DEK-MW-22006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-08	5/4/22	—	GW	DUP-DEK-BAP-02	9	4	1	1	1	2			x	x	x	x	x	x	x	x	

RELINQUISHED BY: DATE/TIME: 5/5/22 0830 RECEIVED BY:

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

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

Temperature: 0.2-1.4 °C Cal. Due Date: 6-3-22

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN
190

eurofins | Environment Testing America

Client Information	Sampler: Jake Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-94787-29053.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:

Address: 1540 Eisenhower Place	Due Date Requested:	
City: Ann Arbor	TAT Requested (days):	
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No	
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD	
Email: JKrenz@trccompanies.com	WO #:	
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond & I	Project #: 24024154	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
~~DEK-MW-15003~~				~~Water~~						
DEK-MW-18001	5-4-22	1344	G	Water	N	N	X	X		
				Water						

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

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Checked by HS 5/15/22

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

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Client Information	Sampler: Jacob Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-94788-29054.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:

Address: 1540 Eisenhower Place	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Ann Arbor	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No		
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD		Other:
Email: JKrenz@trccompanies.com	WO #:		
Project Name: Karn/Weadock CCR DEK Lined Impoundment	Project #: 24024154		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
OW-10	5-3-22	1425	G	Water	N	N	X	X		
OW-11	5-3-22	0927	G	Water			X	X		
OW-12	5-3-22	1242	G	Water			X	X		
KLI-DUP	5-3-22	—	G	Water			X	X		
EB-KLI	5-7-22	1305	G	Water			X	X		
DEK-MW-15003	5-3-22	1052	G	Water			X	X		
KLI-SCS	5-3-22	0759	G	Water			X	X		
				Water						

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

5/5/22 Checked by HS

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing America

47 48 49

Client Information	Sampler: Henry Schmidt	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-94789-29052.1
Client Contact: Jacob Krenz	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
DEK-MW-15002	5/3/22	1421		Water	N	N	X	X		
DEK-MW-~~15004~~ EB		0943		Water	N	N	X	X		
DEK-MW-15005		1256		Water	N	N	X	X		
DEK-MW-15006		1043		Water	N	N	X	X		
DUP-DEK-BAP		—		Water	N	N	X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Henry Schmidt	5/3/22 1600	TRC	Fedex/Jel Thy	5/3/22 1600	Fedex TRC
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Checked by HS 5/5/22

pg 48 of 48

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

MICHIGAN 190

eurofins | Environment Testing America

Client Information	Sampler: Henry Schmaedt	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-94785-33282.1
Client Contact: Jacob Krenz	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:

Address: 1540 Eisenhower Place	Due Date Requested:
City: Ann Arbor	TAT Requested (days):
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: TBD
Email: JKrenz@trccompanies.com	WO #:
Project Name: Karn/Weadock CCR Background Well	Project #: 24024154
Site:	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
MW-15002	5/2/22	1724	G	Water	N	N	X	X		
MW-15008	5/2/22	1345	G	Water	N	N	X	X		
MW-15016	5/3/22	837	G	Water	N	N	X	X		
MW-15019	5/2/22	1590	G	Water	N	N	X	X		
DUP-04	5/2/22	—	G	Water	N	N	X	X		
EB-04	5/2/22	1045	G	Water	N	N	X	X		
				Water						

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Henry Schmaedt	5/3/22/1600	TRC	[signature]	5-3-22 /1600	TRC

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Checked by KS 5/5/22

Appendix C
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event May 2022
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the May 2022 sampling event. The sample was analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analysis was subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDGs) 22-0437, S35622.01(01), and 81646.

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

- DEK-MW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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

Data Usability Review Procedure

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

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

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.
- A field blank was not collected with this data set.
- An equipment blank was not collected with this data set.
- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, ammonia, alkalinity, sulfide, TOC, and DOC. 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 with the exception of the sulfide analysis which met RPD criteria. However, since

all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.

- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review
Groundwater Monitoring Event May 2022
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the May 2022 sampling event. The sample was analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166148-1.

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

- DEK-MW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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

Data Usability Review Procedure

The analytical data were reviewed using the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- Target analytes were not detected in the method blanks.
- No equipment or field blank were collected.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
    - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with the sample. The positive detection of radium 228 in sample DEK-MW-18001 should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- A field duplicate pair was not collected.
- Carrier recoveries were within 40-110%.

Attachment A
Summary of Data Non-Conformances for Landfill Groundwater Analytical Data
DE Karn Bottom Ash Pond Lined Impoundment– CCR Monitoring Program
Erie, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-18001	5/4/2022	Radium 228	Detected result should be considered estimated due to LCS/LCSD Relative Error Ratio (RER) outside of criteria.

Laboratory Data Quality Review
Groundwater/Surface Water Monitoring Event May 2022
DE Karn Lined Impoundment

Groundwater and surface water samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for total and dissolved metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analyses were subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDGs) 22-0438, S35621.01(01), and 81648.

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

- OW-10
- OW-11
- OW-12
- DEK-MW-15003

During the May 2022 sampling event, the following water/surface water samples were collected:

- KLI-SCS
- KLI-PCS
- SW-DITCH

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

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total and Dissolved Metals	SW-846 6020A/6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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

Data Usability Review Procedure

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

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.
- One field blank (FB-KLI) and one equipment blank (EB-KLI) were collected with this data set. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample KLI-PCS for TOC/DOC. All criteria were met.

- The field duplicate pair samples were DUP-KLI with DEK-MW-15003; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits with the following exception.
    - RPD for alkalinity was outside of criteria (35%) and the alkalinity results for all groundwater samples are potentially uncertain as summarized in the attached table, Attachment A.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The DOC results were greater than the TOC results and the percent differences between the results was >20% for samples OW-11 and SW-DITCH where the results were >5x the RL. The results for DOC and TOC in these samples are potentially uncertain as summarized in the attached table, Attachment A.

Attachment A
Summary of Data Non-Conformances for Groundwater Analytical Data
DE Karn Lined Impoundment – CCR Monitoring Program
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
OW-11	5/3/2022	TOC/DOC	Potential uncertainty due to DOC results > TOC results and >20% difference between results when both results are >5x the RL
SW-DITCH	5/3/2022		
DEK-MW-15003	5/3/2022	Alkalinity	Potential uncertainty due to field duplicate RPD (>30%)
OW-10	5/3/2022		
OW-11	5/3/2022		
OW-12	5/3/2022		
DUP-KLI	5/3/2022		

Laboratory Data Quality Review
Groundwater Monitoring Event May 2022
DE Karn Lined Impoundment

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166155-1.

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

- OW-10
- OW-11
- OW-12
- DEK-MW-15003

During the May 2022 sampling event, the following water/surface water sample was collected:

- KLI-SCS

Each sample was analyzed for the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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

Data Usability Review Procedure

The analytical data were reviewed using the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

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

- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- Target analytes were not detected in the method blanks.
- One equipment blank (EB-KLI) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
    - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with all samples. The positive detection of radium 228 in sample DEK-MW-15003 should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were KLI-DUP/DEK-MW-15003. All criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A
Summary of Data Non-Conformances for Groundwater Analytical Data
DE Karn Lined Impoundment – CCR Monitoring Program
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-15003	5/3/2022	Radium 228	Detected result should be considered estimated due to LCS/LCSD Relative Error Ratio (RER) outside of criteria.

Appendix D
Statistical Analysis

Appendix D
Statistical Summary for DE Karn Lined Impoundment
Second Quarter 2022
Data from August 2020 to May 2022

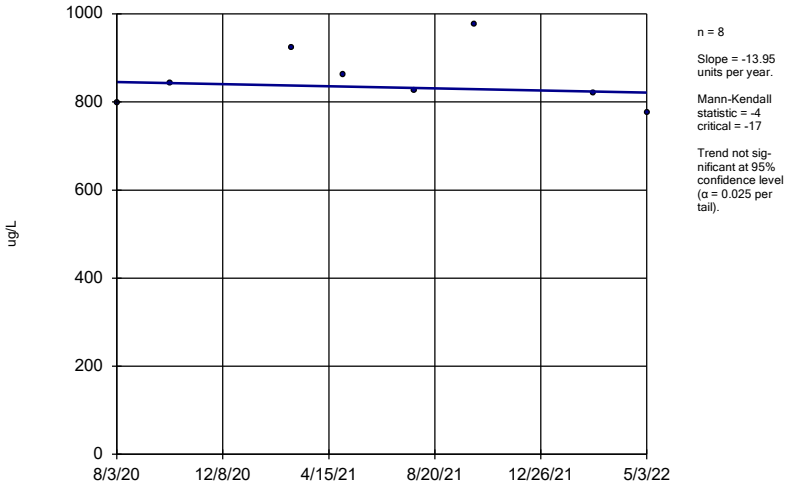
Karn Lined Impoundment Wells						
PARAMETER	**Range, Test, or Limit**	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**
Boron	Trend	O	↓*	O	↑ ASD	O
Calcium	Trend	O	O	O	↓	O
Chloride	Trend	↑ ASD	O	O	↓	↑*
Fluoride	Trend	O*	O	O*	↓	O*
Iron	Trend	O	↑ ASD	O	O	O
pH	Trend	O	O	O	↑ ASD	O
Sulfate	Trend	O	↑ ASD	O	O	O
Total Dissolved Solids	Trend	O	O	O	O	O

Notes:

O* = Non-detect
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (First Quarter 2022 Hydrogeological Monitoring Report for the Karn Lined Impoundment CCR Unit, TRC, April 2022.)

Boron, Total

DEK-MW-15003



n = 8

Slope = -13.95 units per year.

Mann-Kendall statistic = -4 critical = -17

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

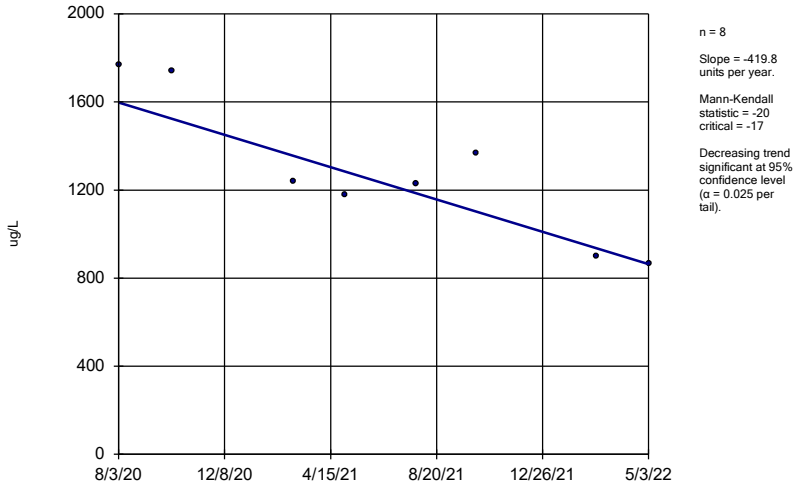
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Boron, Total

DEK-MW-18001



n = 8

Slope = -419.8 units per year.

Mann-Kendall statistic = -20 critical = -17

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

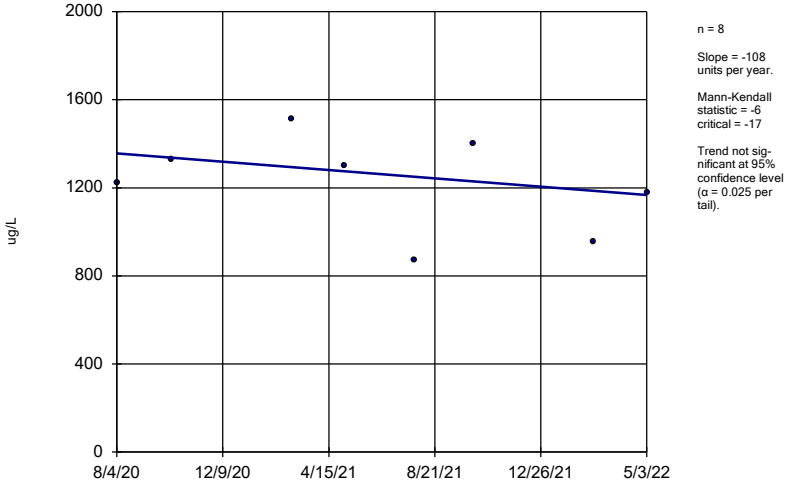
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Boron, Total

OW-10



n = 8

Slope = -108 units per year.

Mann-Kendall statistic = -6 critical = -17

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

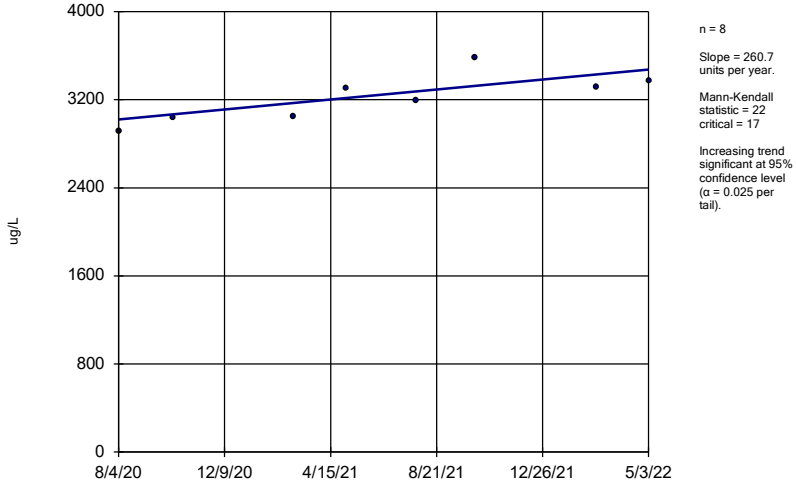
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Boron, Total

OW-11



n = 8

Slope = 260.7 units per year.

Mann-Kendall statistic = 22 critical = 17

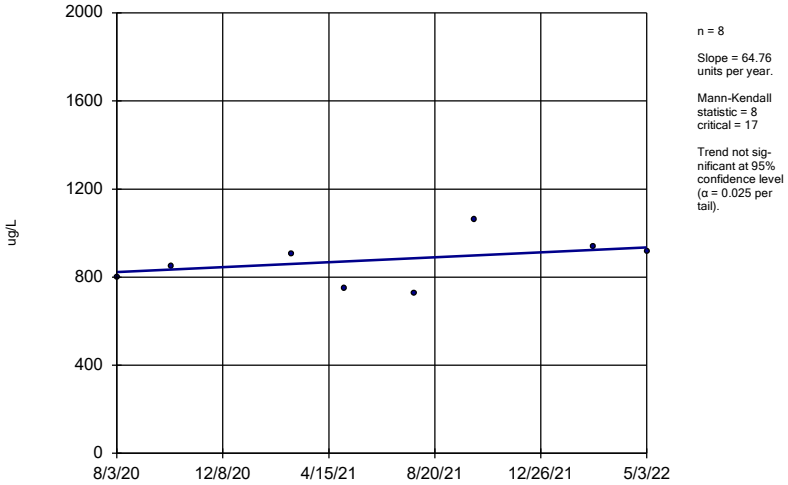
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Boron, Total

OW-12



n = 8

Slope = 64.76 units per year.

Mann-Kendall statistic = 8 critical = 17

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

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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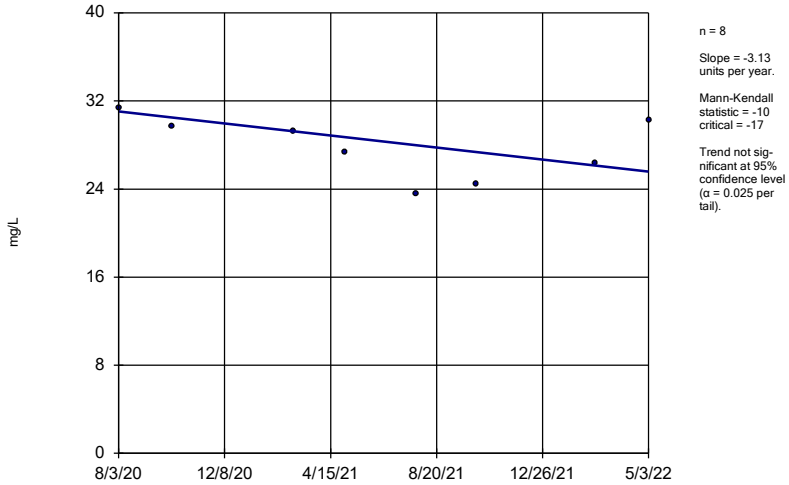
Calcium, Total

DEK-MW-15003



n = 8

Slope = -3.13 units per year.

Mann-Kendall statistic = -10 critical = -17

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

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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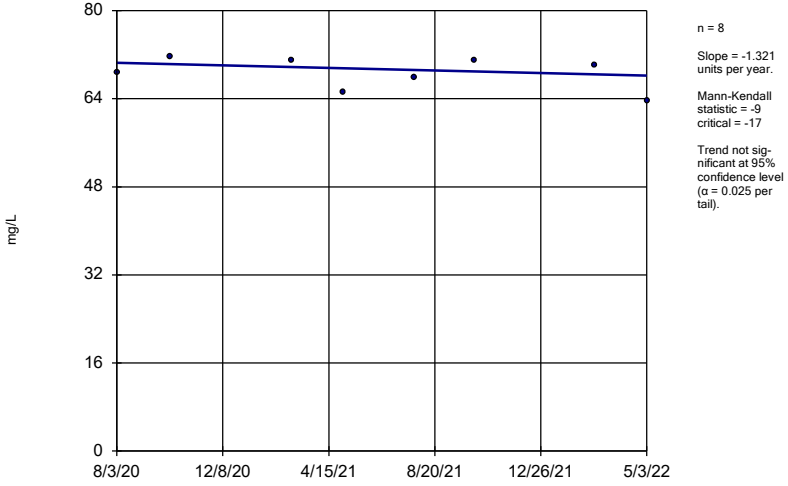
Calcium, Total

DEK-MW-18001



n = 8

Slope = -1.321 units per year.

Mann-Kendall statistic = -9 critical = -17

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

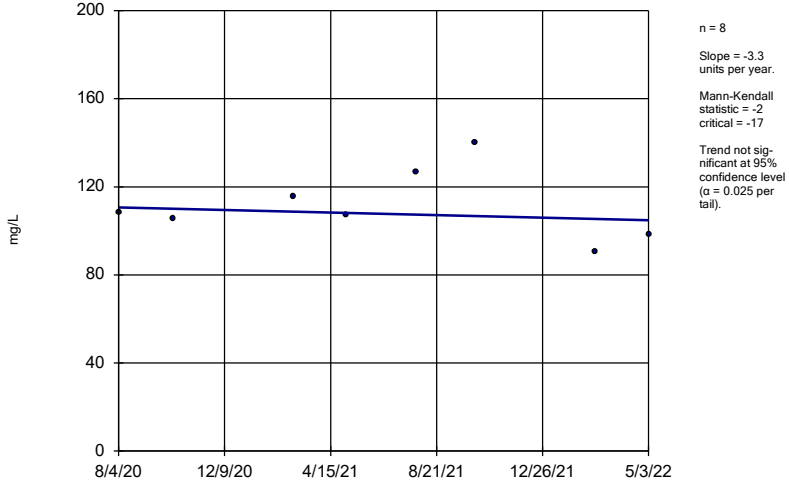
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Calcium, Total

OW-10



n = 8

Slope = -3.3 units per year.

Mann-Kendall statistic = -2 critical = -17

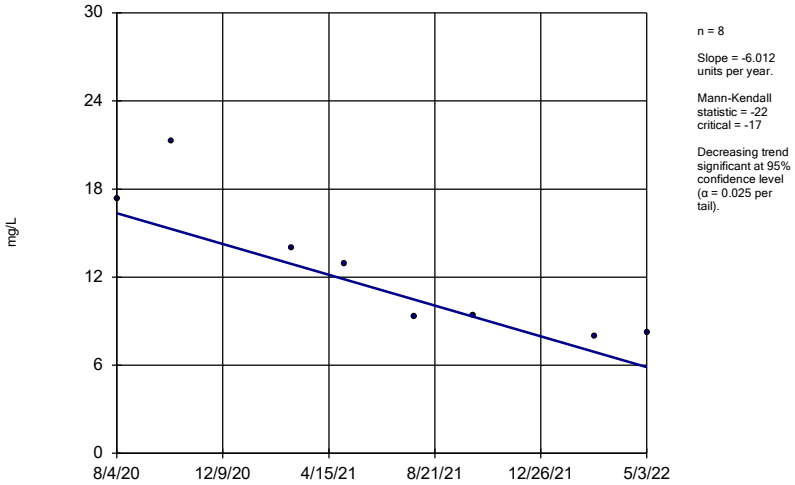
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Calcium, Total

OW-11



n = 8

Slope = -6.012 units per year.

Mann-Kendall statistic = -22 critical = -17

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

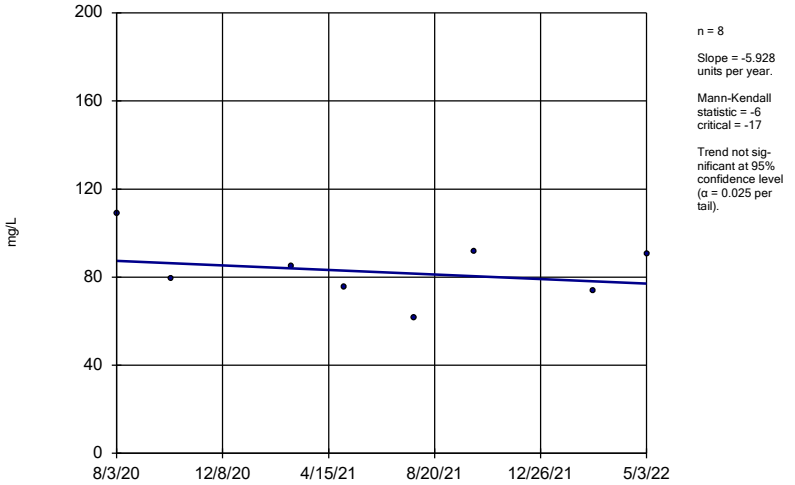
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Calcium, Total

OW-12



n = 8

Slope = -5.928 units per year.

Mann-Kendall statistic = -6 critical = -17

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

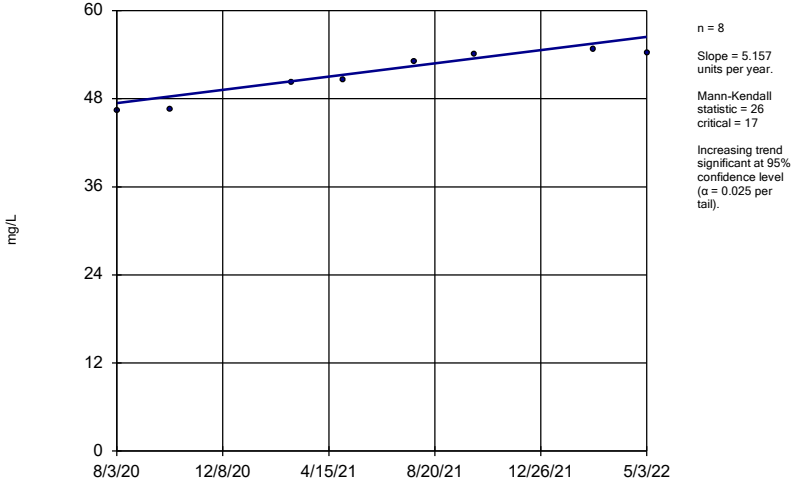
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Chloride

DEK-MW-15003



n = 8

Slope = 5.157 units per year.

Mann-Kendall statistic = 26 critical = 17

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

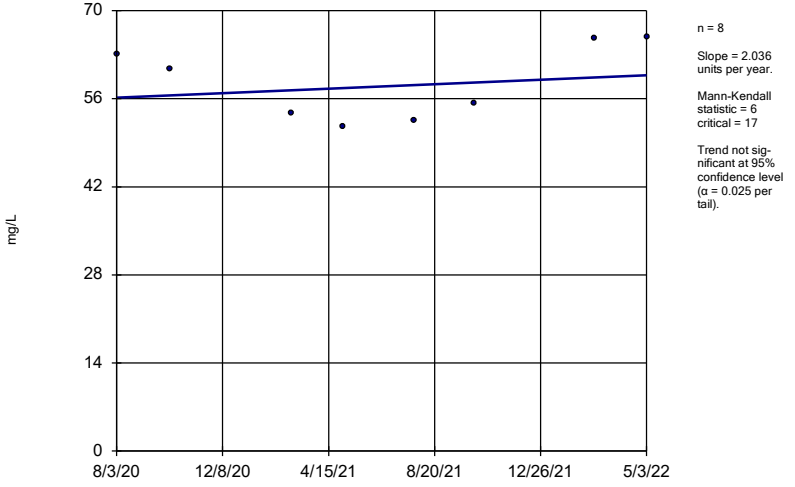
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Chloride

DEK-MW-18001



n = 8

Slope = 2.036 units per year.

Mann-Kendall statistic = 6 critical = 17

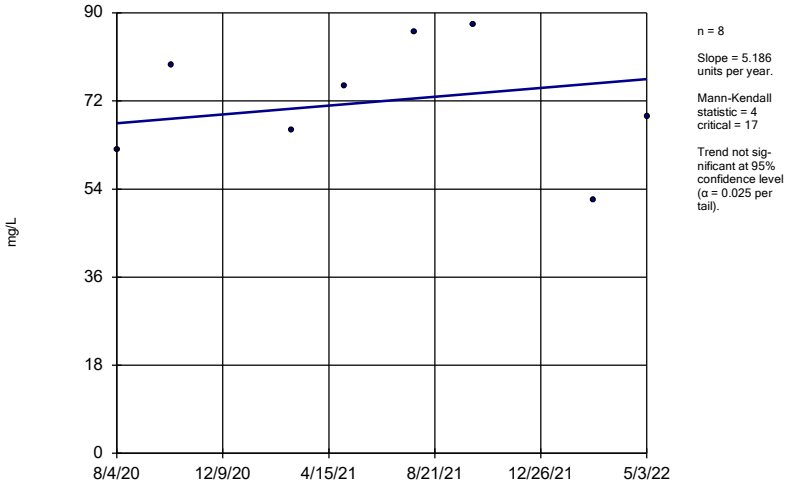
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Chloride

OW-10



n = 8

Slope = 5.186 units per year.

Mann-Kendall statistic = 4
critical = 17

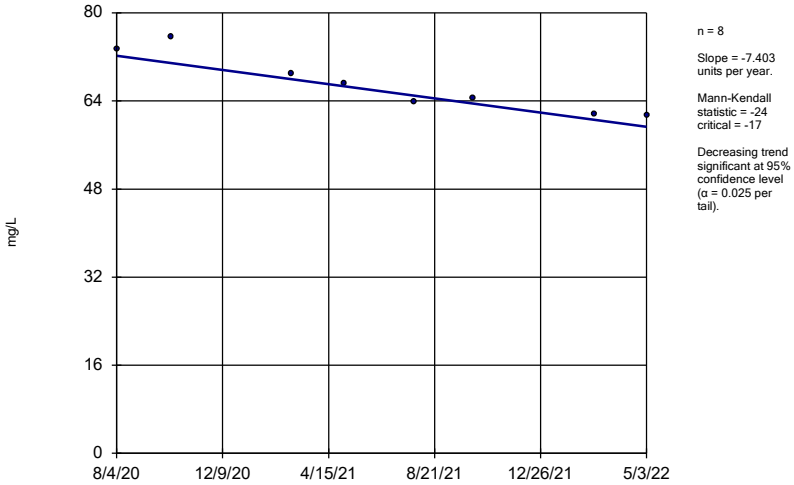
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Chloride

OW-11



n = 8

Slope = -7.403 units per year.

Mann-Kendall statistic = -24
critical = -17

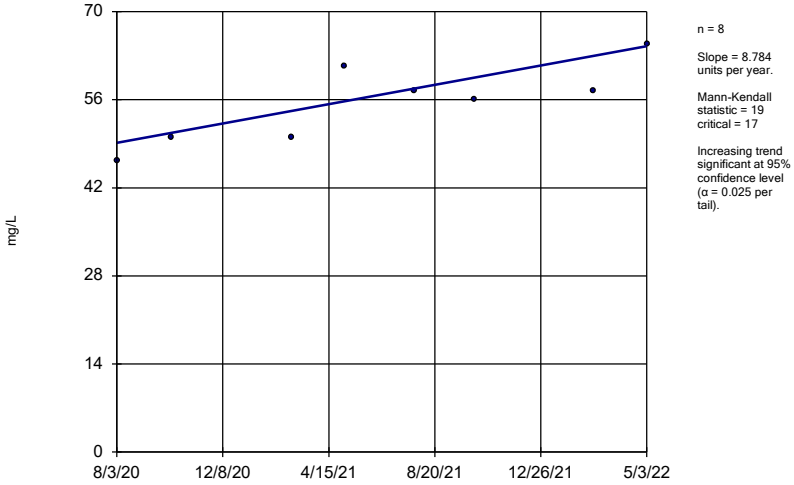
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Chloride

OW-12



n = 8

Slope = 8.784 units per year.

Mann-Kendall statistic = 19
critical = 17

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

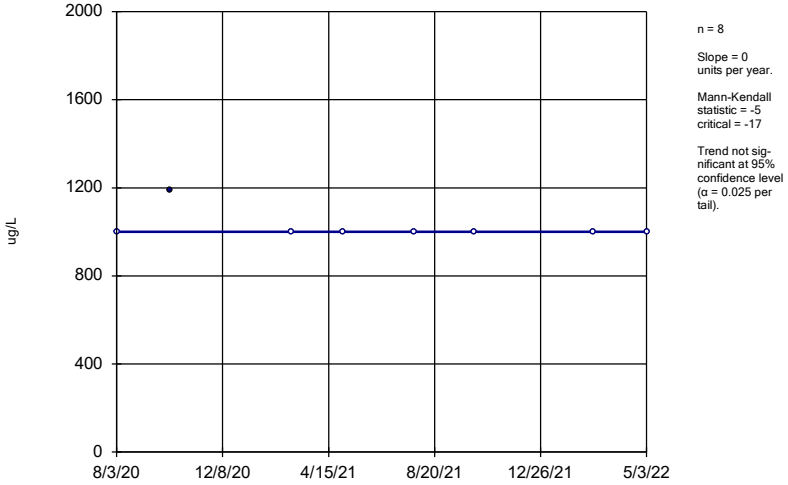
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Hollow symbols indicate censored values.

Fluoride

DEK-MW-15003



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -5
critical = -17

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

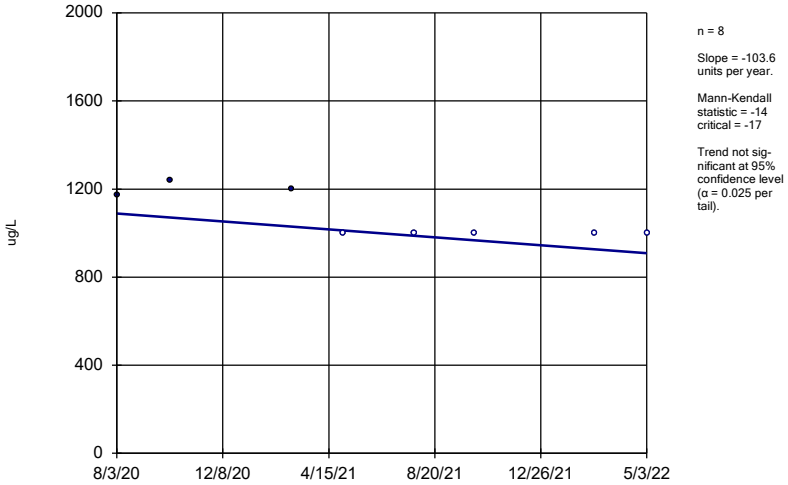
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Fluoride

DEK-MW-18001



n = 8

Slope = -103.6 units per year.

Mann-Kendall statistic = -14
critical = -17

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

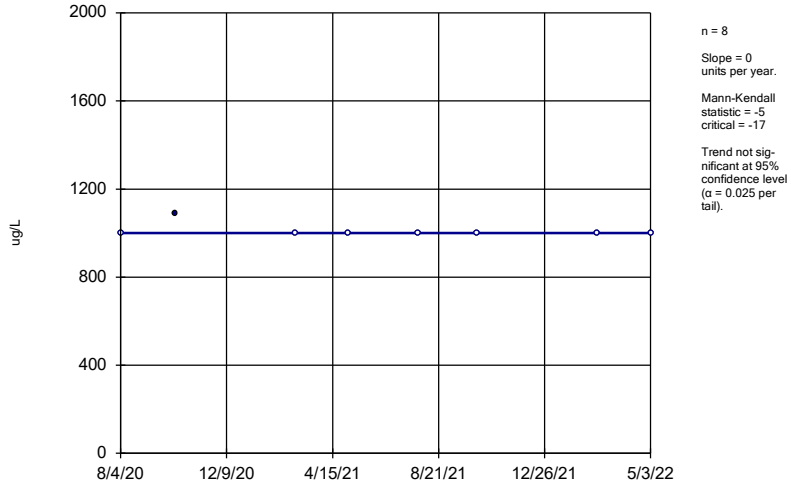
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Fluoride

OW-10



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -5
critical = -17

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

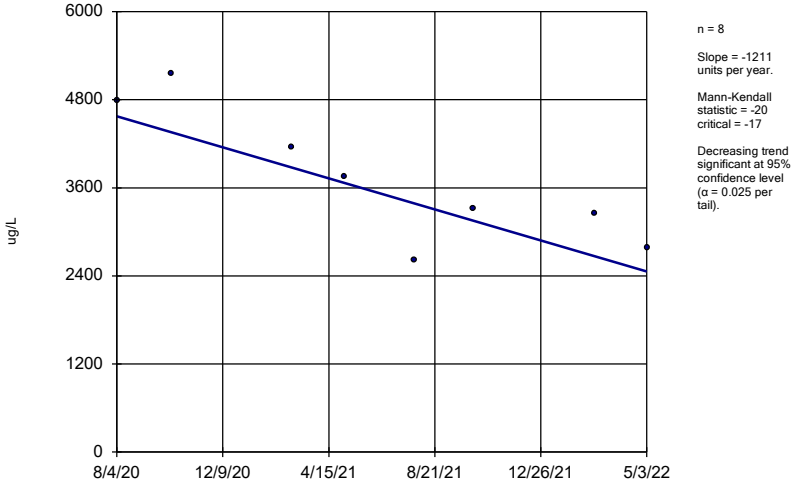
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Fluoride

OW-11



n = 8

Slope = -1211 units per year.

Mann-Kendall statistic = -20
critical = -17

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

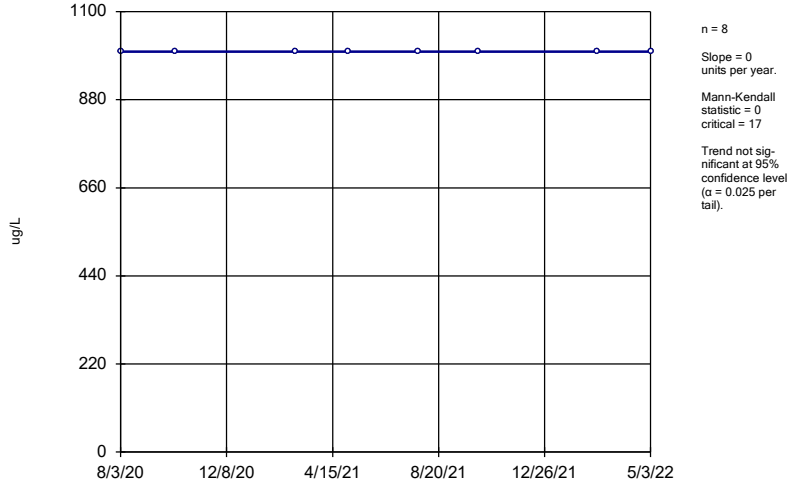
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Fluoride

OW-12



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 17

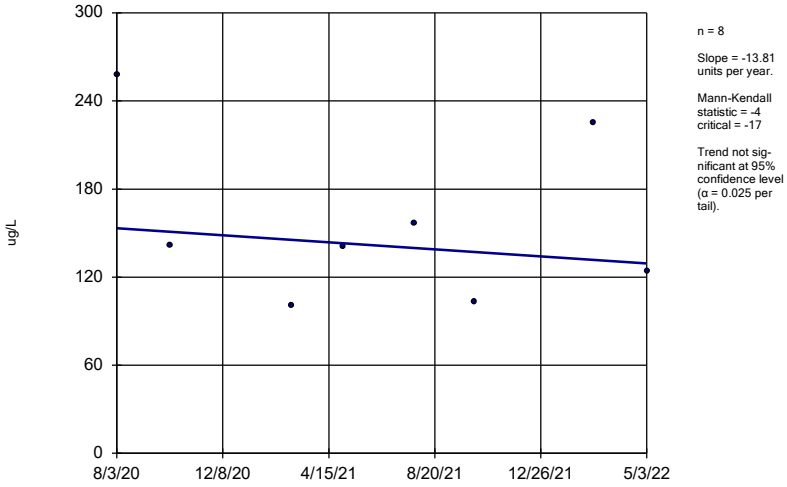
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Iron, Total

DEK-MW-15003



n = 8

Slope = -13.81 units per year.

Mann-Kendall statistic = -4 critical = -17

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

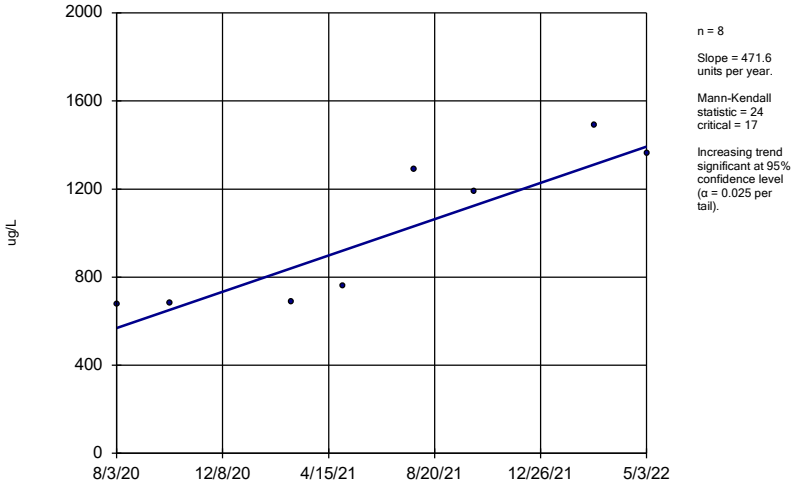
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Iron, Total

DEK-MW-18001



n = 8

Slope = 471.6 units per year.

Mann-Kendall statistic = 24 critical = 17

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

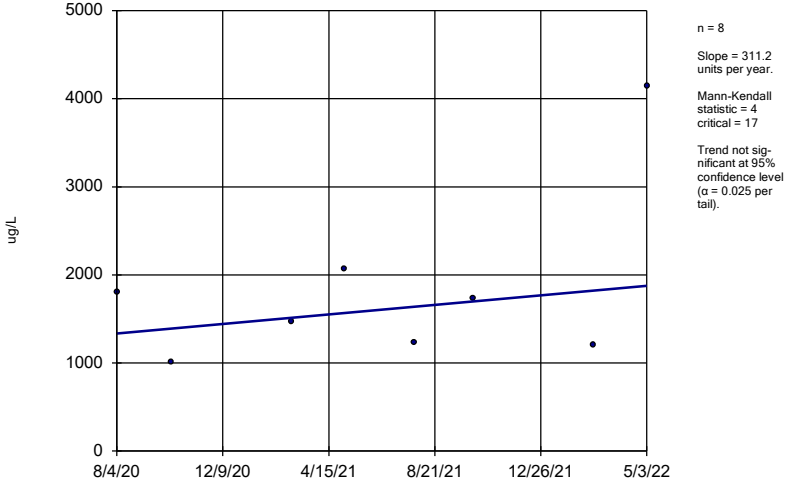
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Iron, Total

OW-10



n = 8

Slope = 311.2 units per year.

Mann-Kendall statistic = 4 critical = 17

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

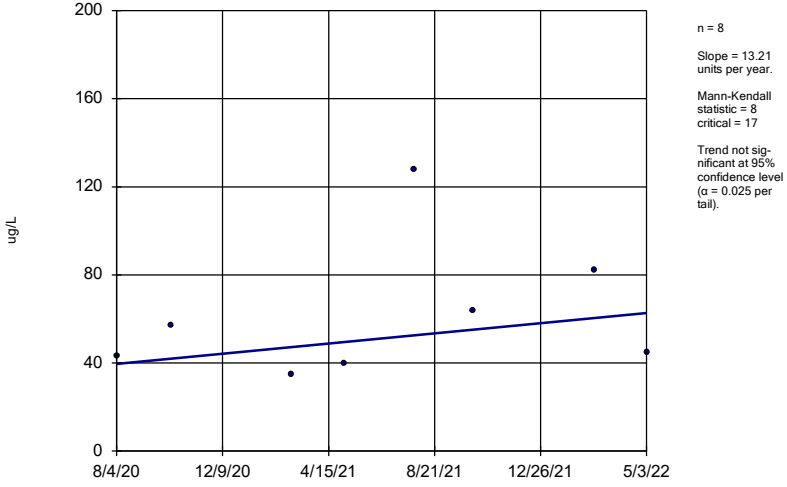
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Iron, Total

OW-11



n = 8

Slope = 13.21 units per year.

Mann-Kendall statistic = 8 critical = 17

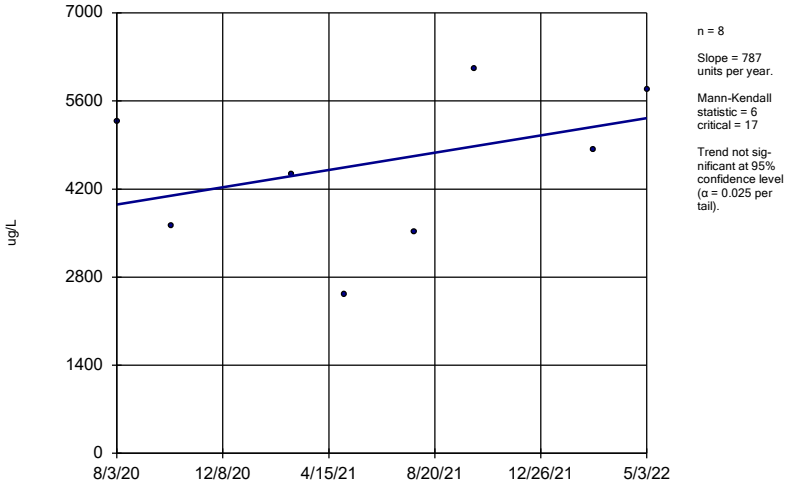
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Iron, Total

OW-12



n = 8

Slope = 787 units per year.

Mann-Kendall statistic = 6
critical = 17

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

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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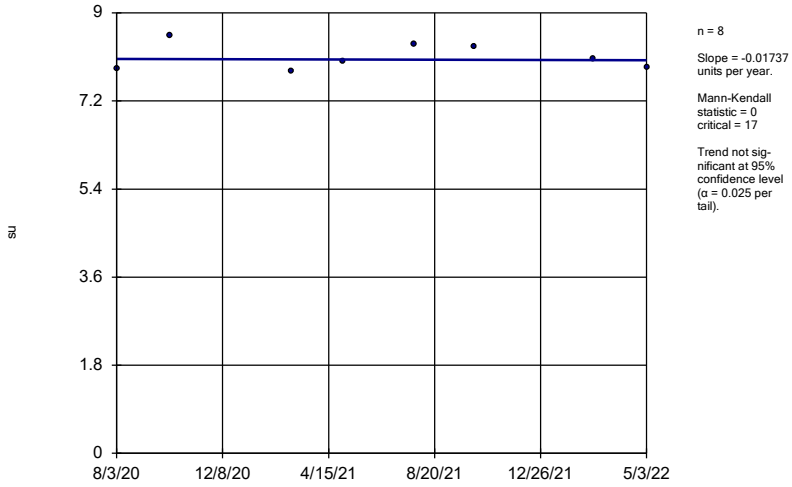
pH, Field

DEK-MW-15003



n = 8

Slope = -0.01737 units per year.

Mann-Kendall statistic = 0
critical = 17

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

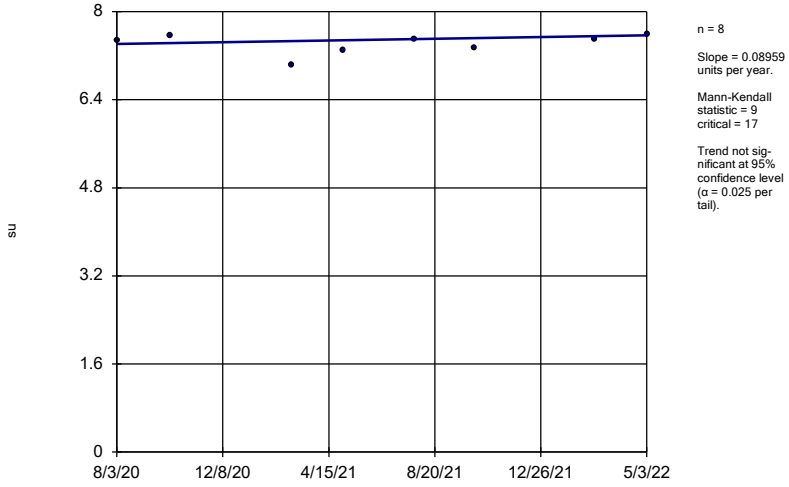
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

pH, Field

DEK-MW-18001



n = 8

Slope = 0.08959 units per year.

Mann-Kendall statistic = 9
critical = 17

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

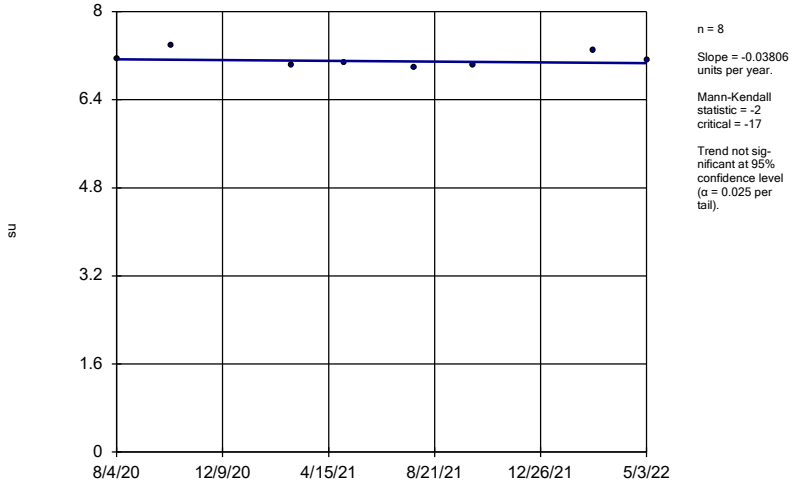
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

pH, Field

OW-10



n = 8

Slope = -0.03806 units per year.

Mann-Kendall statistic = -2
critical = -17

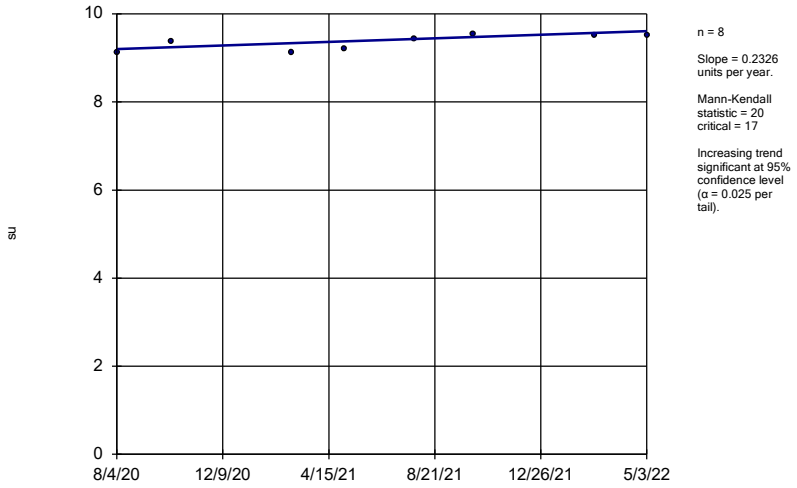
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

pH, Field

OW-11



n = 8

Slope = 0.2326 units per year.

Mann-Kendall statistic = 20 critical = 17

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

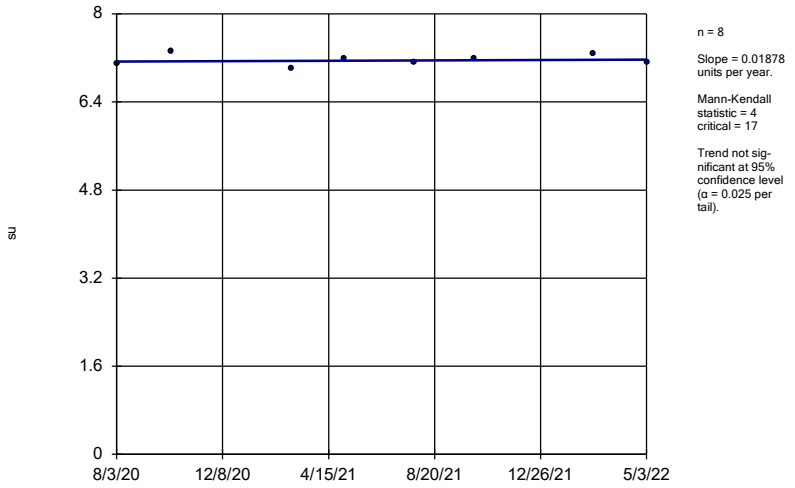
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

pH, Field

OW-12



n = 8

Slope = 0.01878 units per year.

Mann-Kendall statistic = 4 critical = 17

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

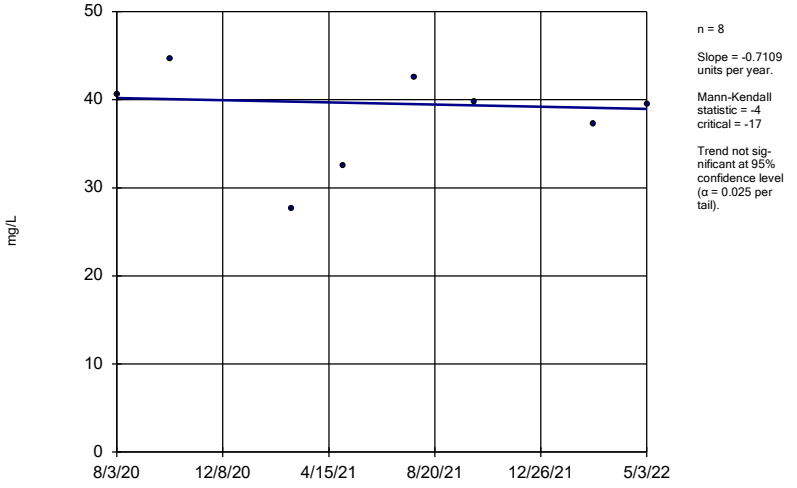
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Sulfate

DEK-MW-15003



n = 8

Slope = -0.7109 units per year.

Mann-Kendall statistic = -4 critical = -17

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

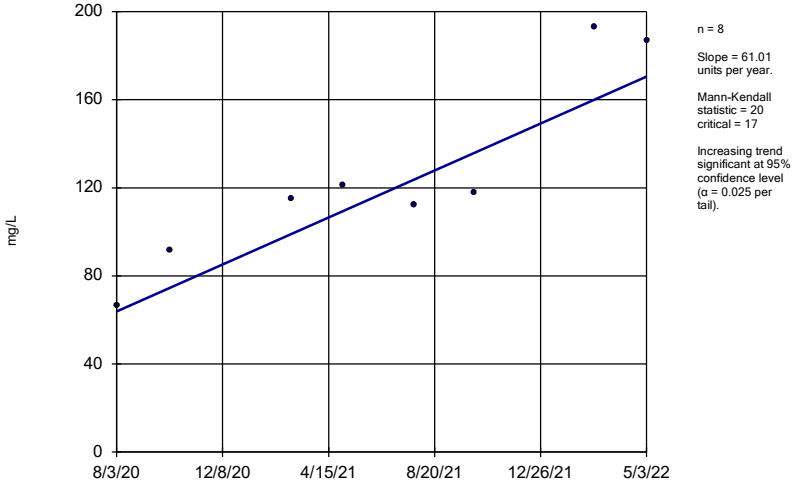
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Sulfate

DEK-MW-18001



n = 8

Slope = 61.01 units per year.

Mann-Kendall statistic = 20 critical = 17

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

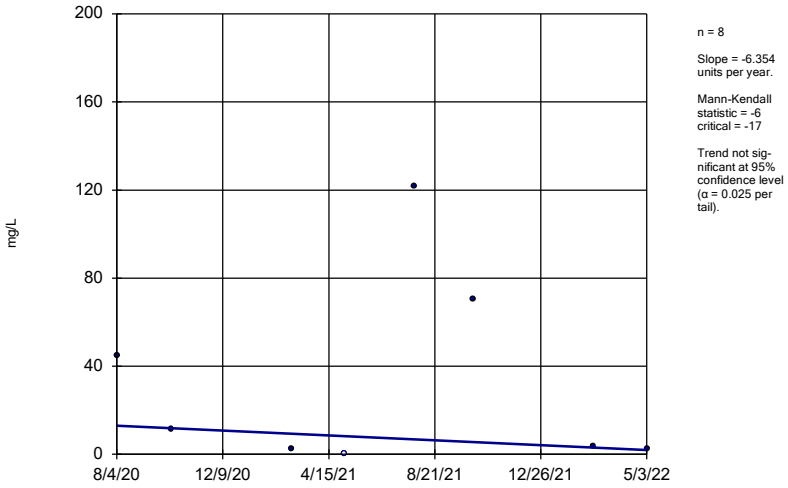
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Hollow symbols indicate censored values.

Sulfate

OW-10



n = 8

Slope = -6.354 units per year.

Mann-Kendall statistic = -6
critical = -17

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

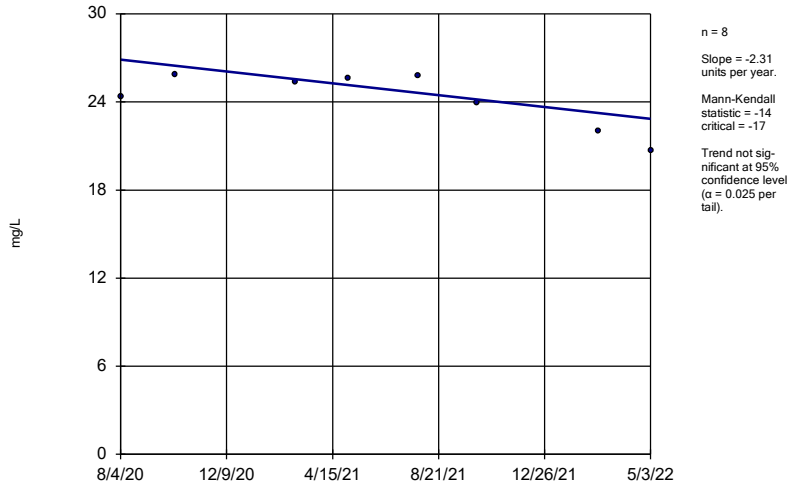
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Sulfate

OW-11



n = 8

Slope = -2.31 units per year.

Mann-Kendall statistic = -14
critical = -17

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

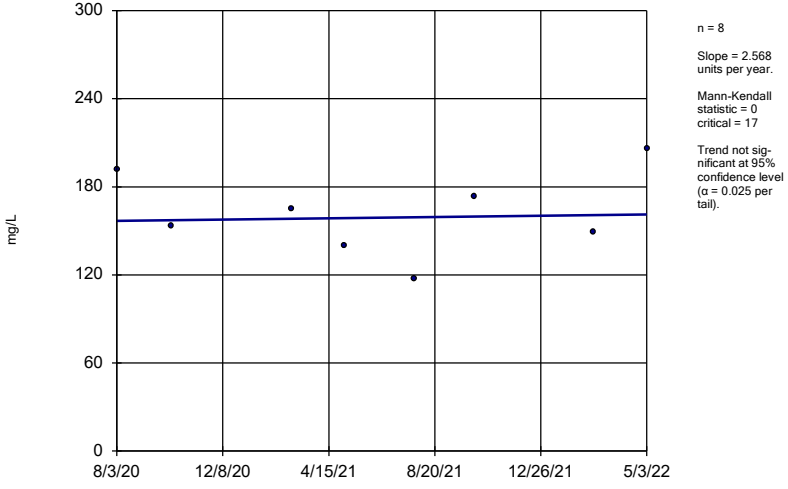
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Sulfate

OW-12



n = 8

Slope = 2.568 units per year.

Mann-Kendall statistic = 0
critical = 17

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

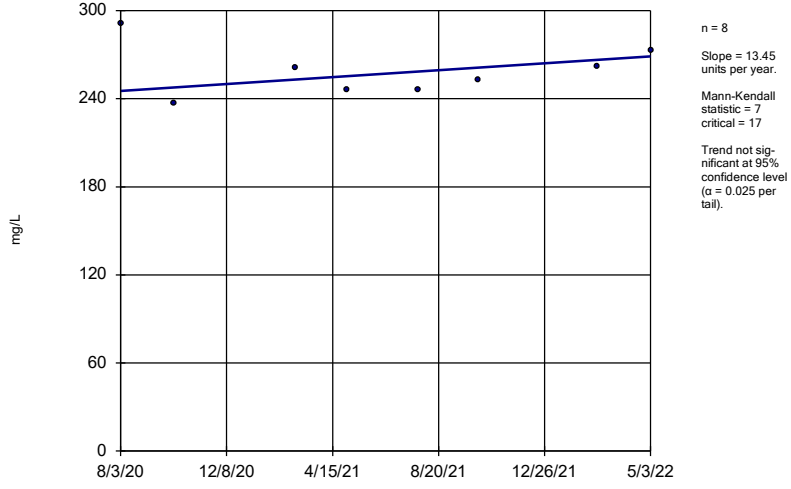
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Total Dissolved Solids

DEK-MW-15003



n = 8

Slope = 13.45 units per year.

Mann-Kendall statistic = 7
critical = 17

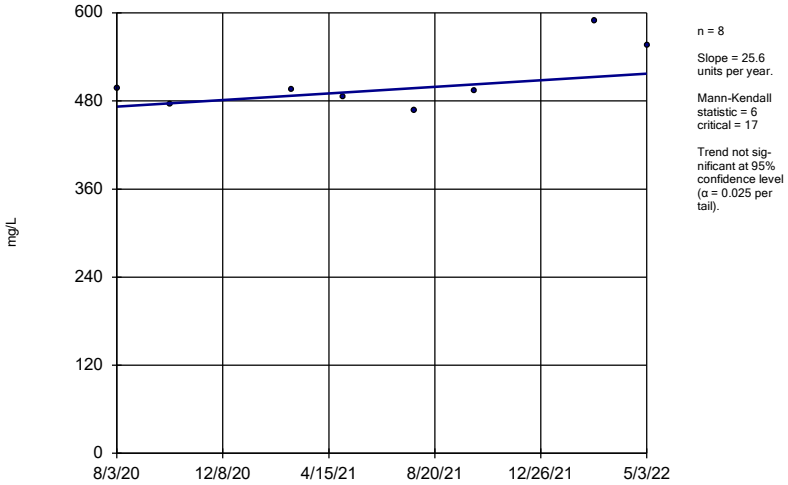
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Total Dissolved Solids

DEK-MW-18001



n = 8

Slope = 25.6 units per year.

Mann-Kendall statistic = 6 critical = 17

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

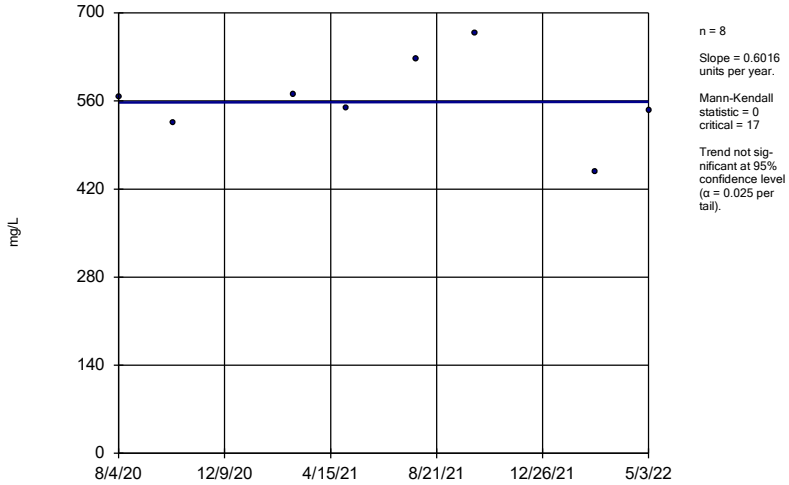
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Total Dissolved Solids

OW-10



n = 8

Slope = 0.6016 units per year.

Mann-Kendall statistic = 0 critical = 17

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

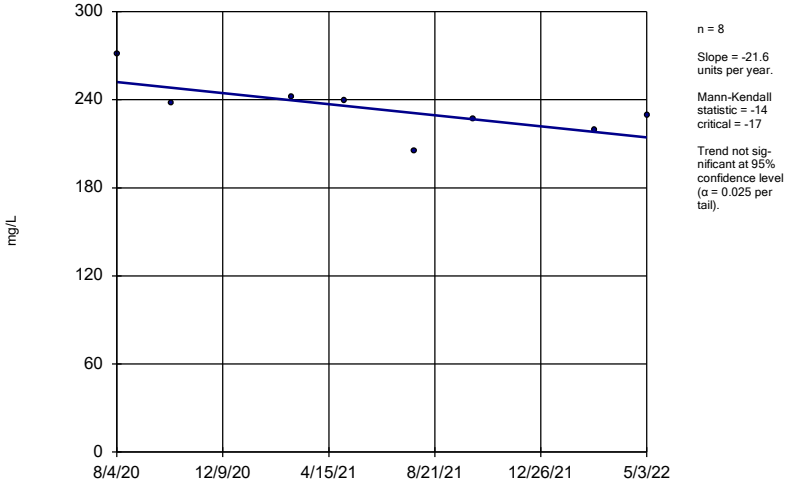
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Total Dissolved Solids

OW-11



n = 8

Slope = -21.6 units per year.

Mann-Kendall statistic = -14 critical = -17

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

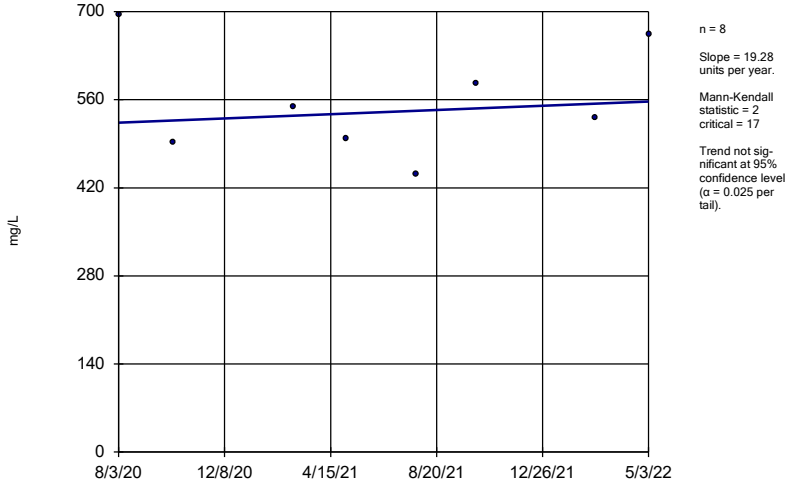
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

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

Total Dissolved Solids

OW-12



n = 8

Slope = 19.28 units per year.

Mann-Kendall statistic = 2 critical = 17

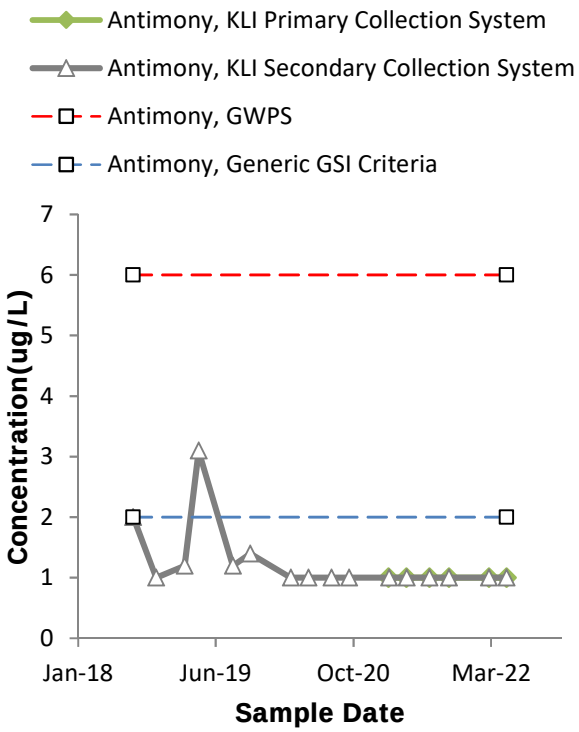
Trend not significant at 95% confidence level (α = 0.025 per tail).

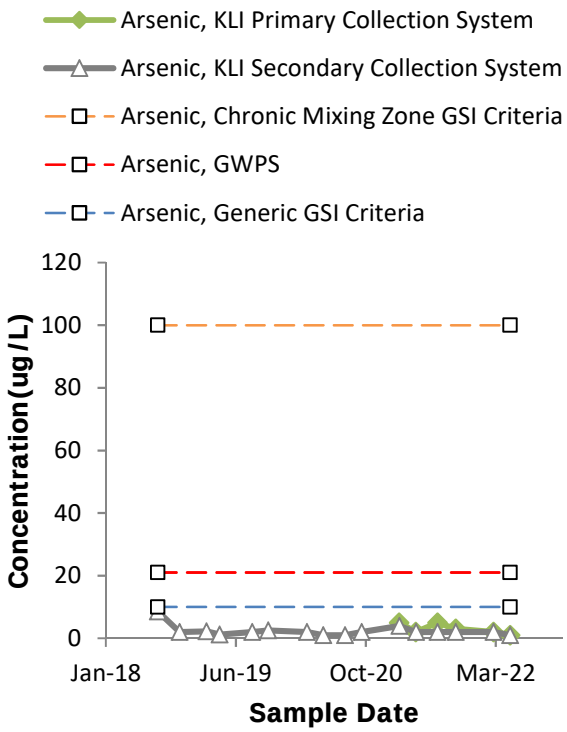
Sen's Slope Estimator Analysis Run 6/9/2022 1:56 PM

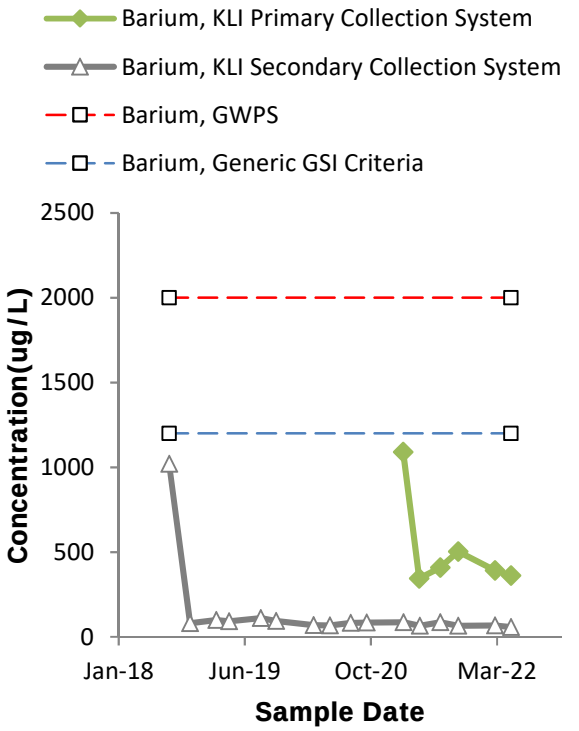
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

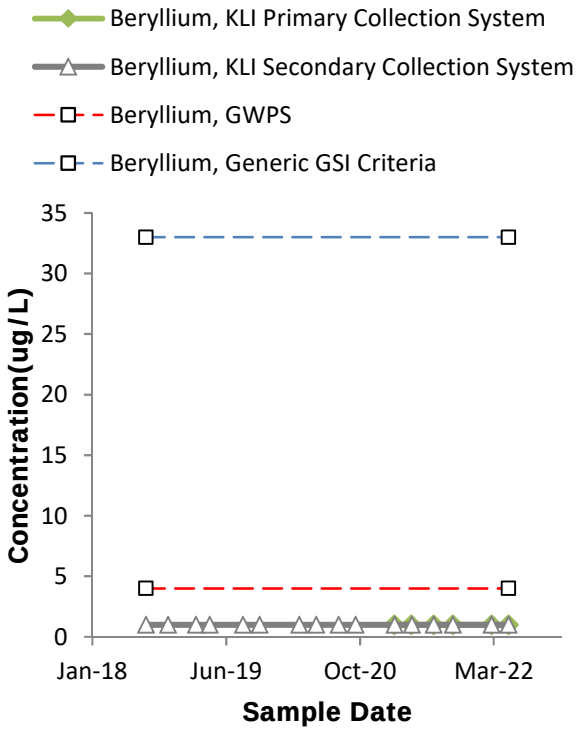
Appendix E
Secondary Leachate Collection System Monitoring

Water Quality Time Series

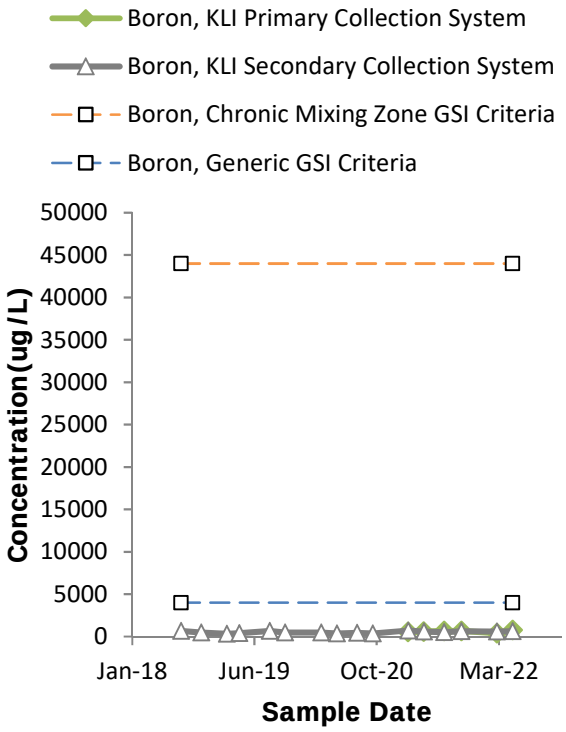


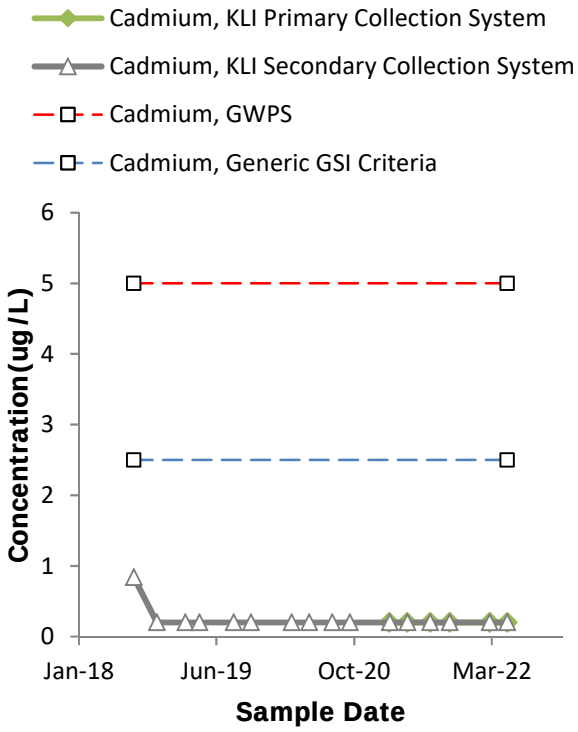


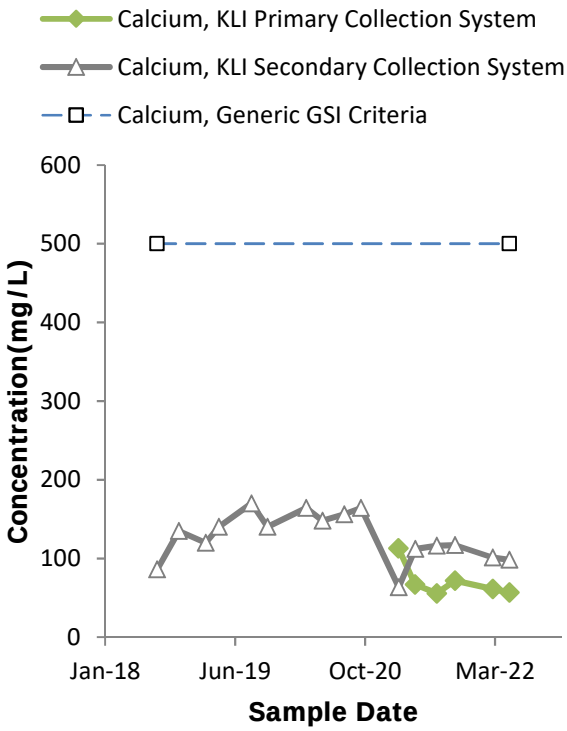


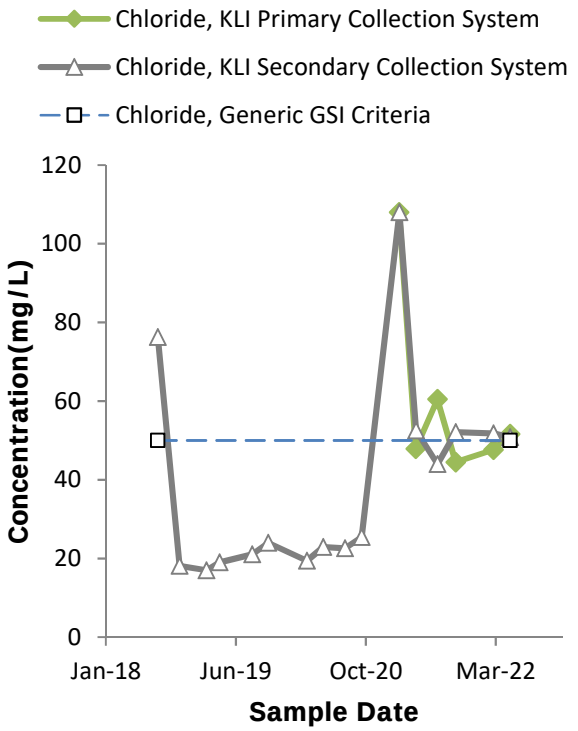


Water Quality Time Series

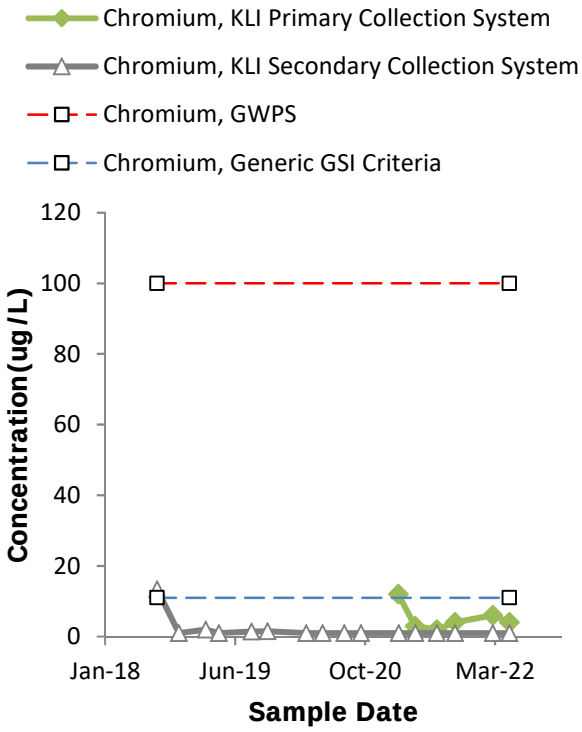


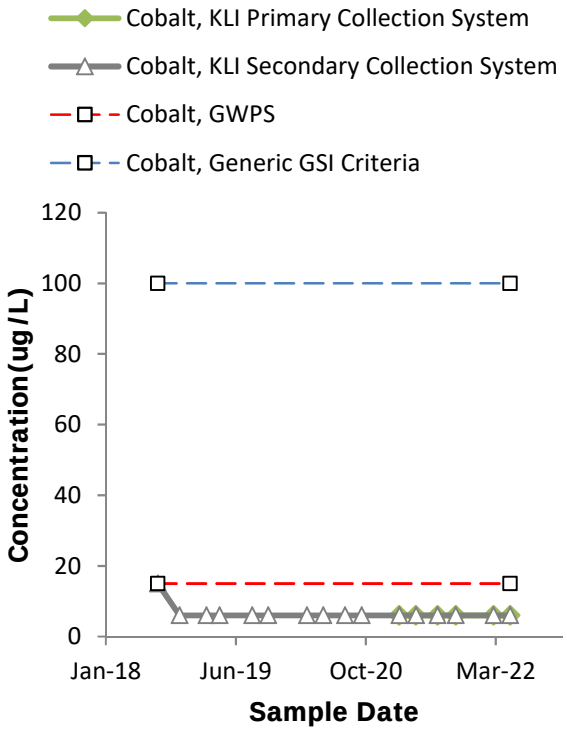


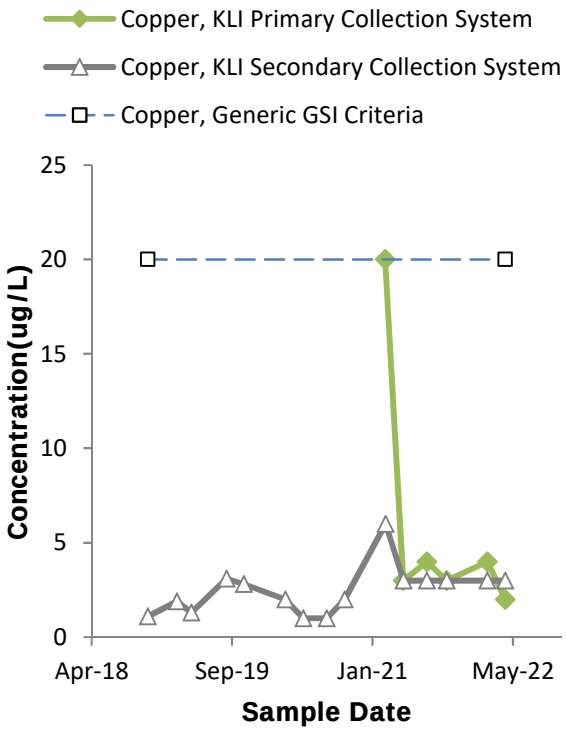


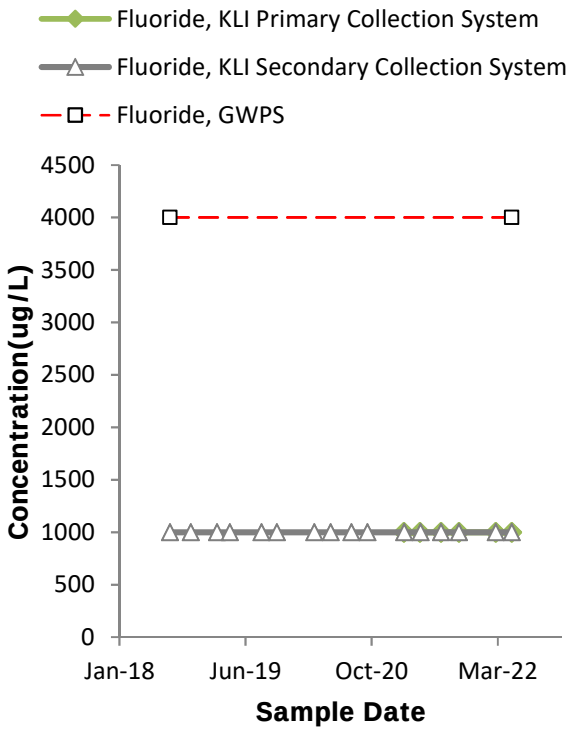


Water Quality Time Series

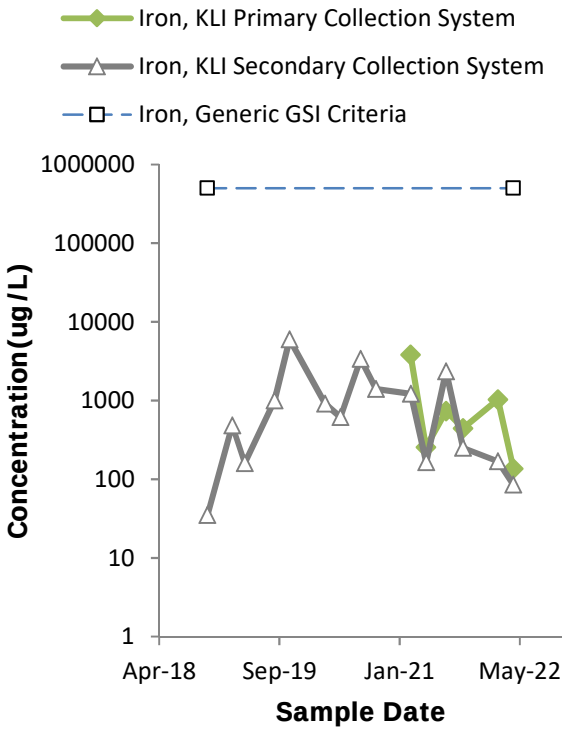


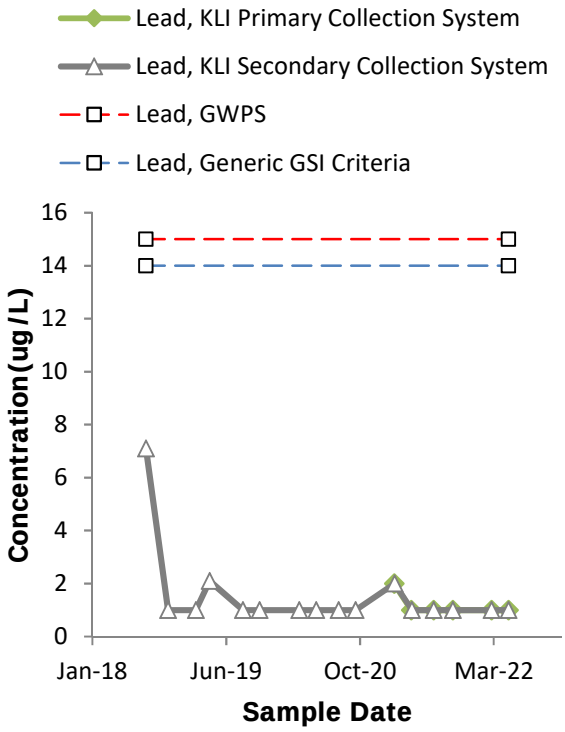


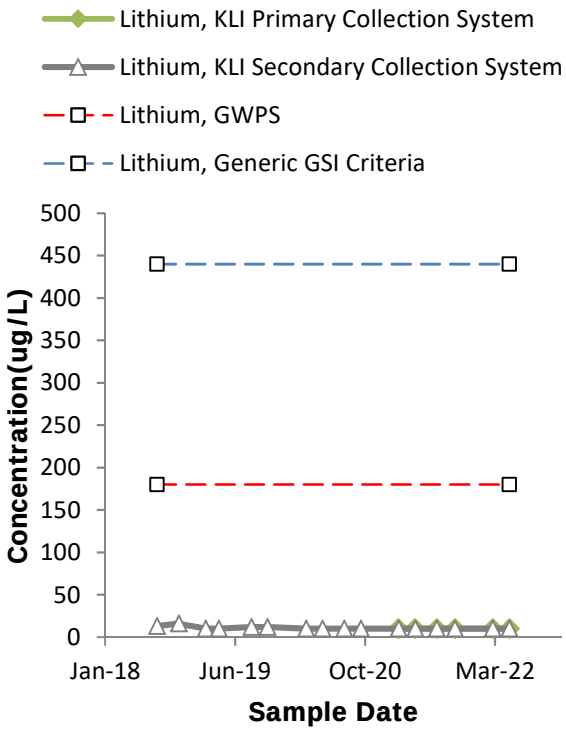


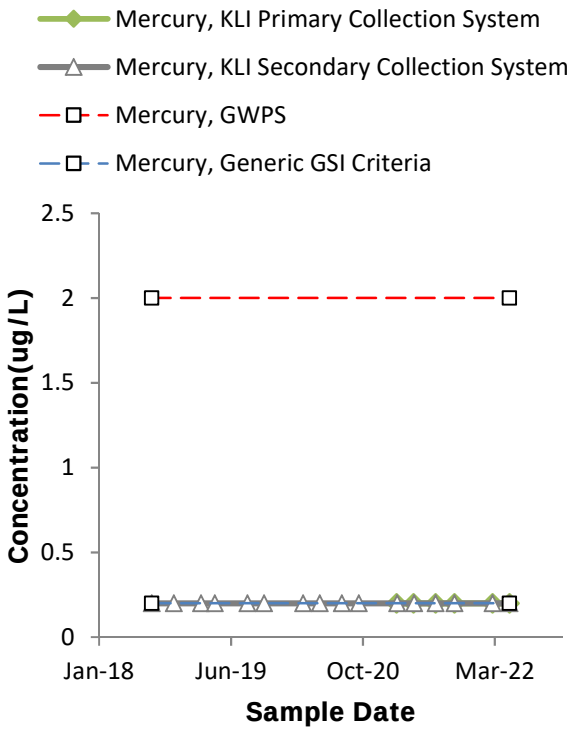


Water Quality Time Series

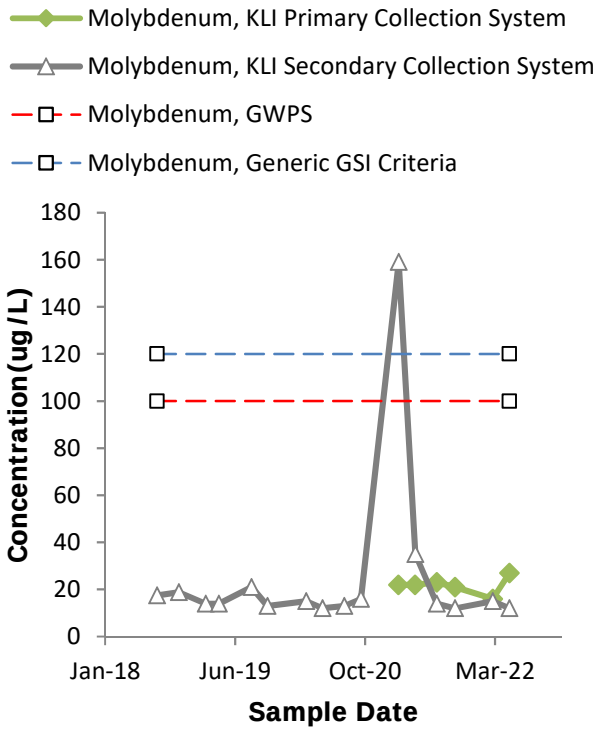


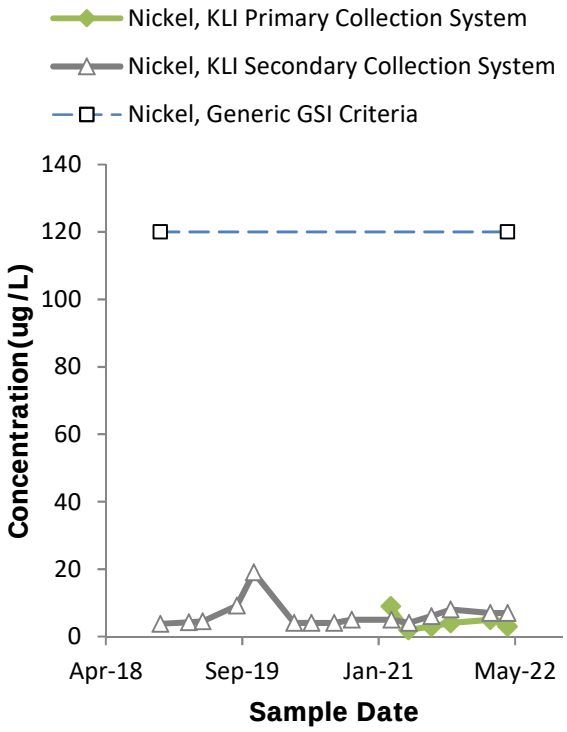


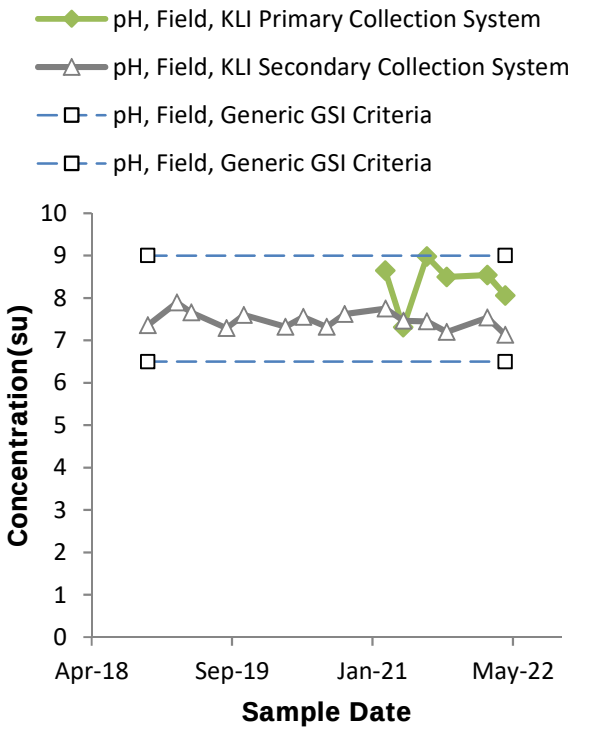


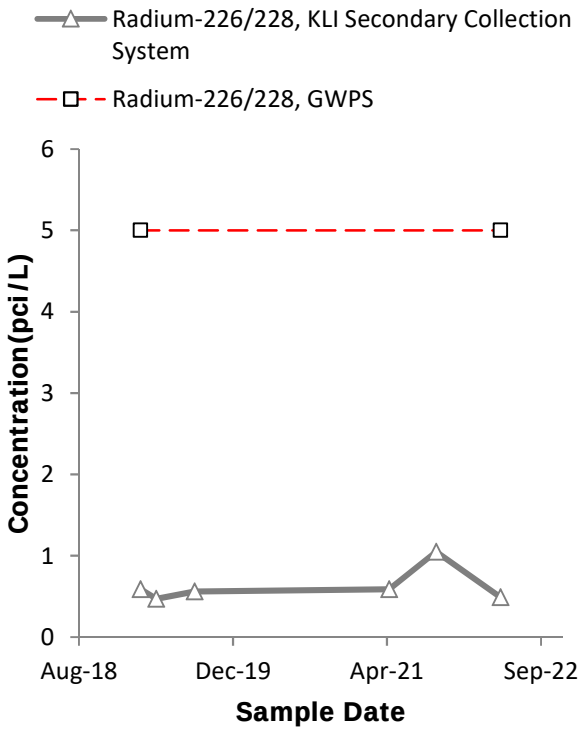


Water Quality Time Series

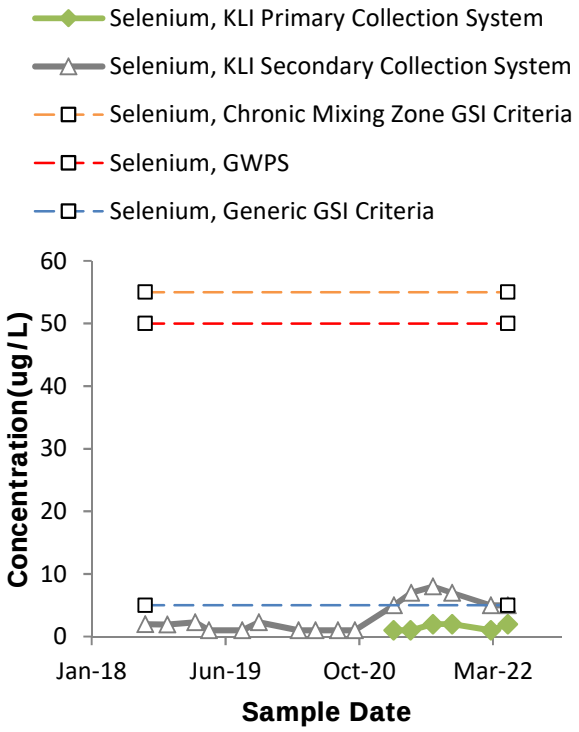


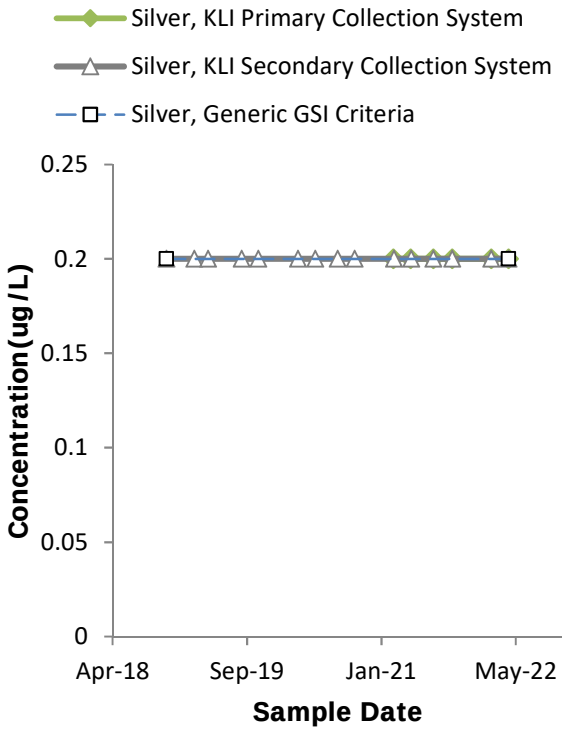


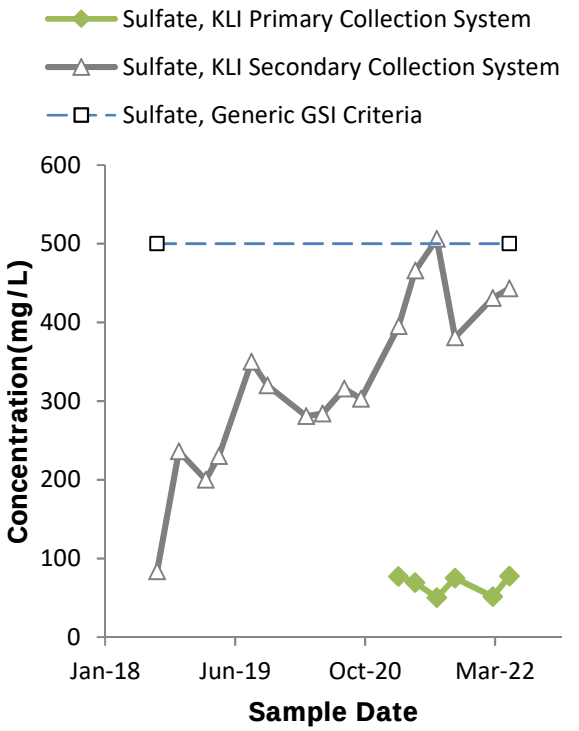


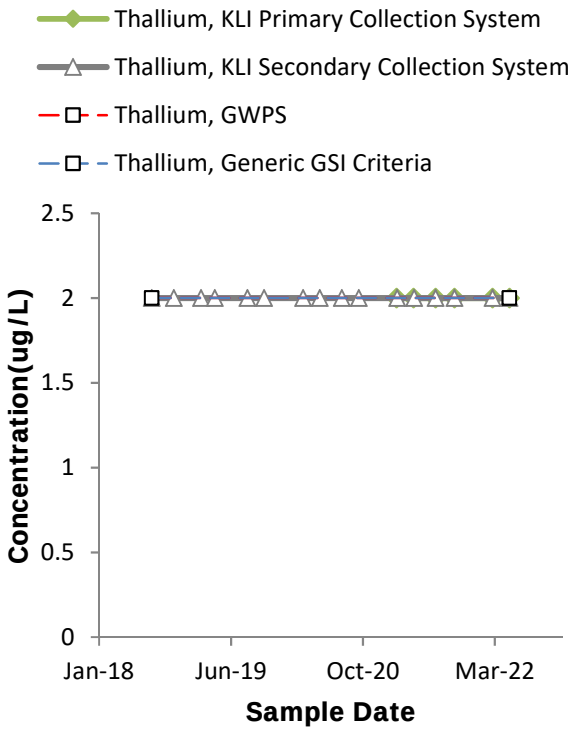


Water Quality Time Series

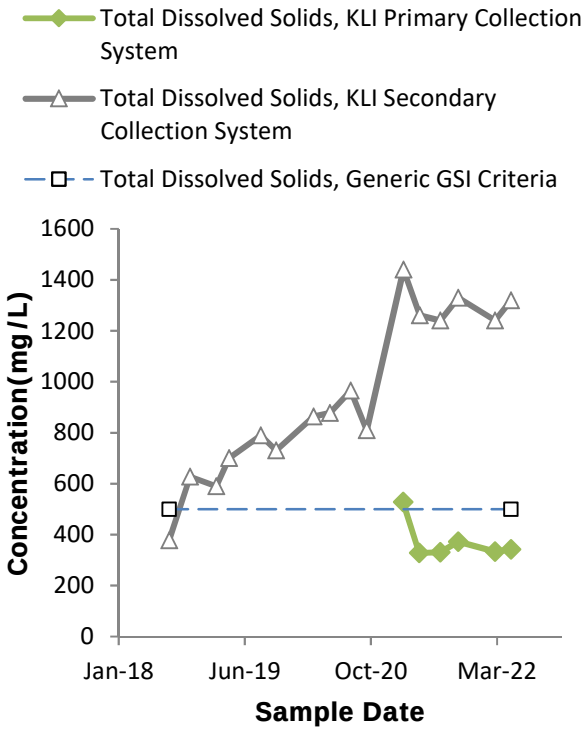


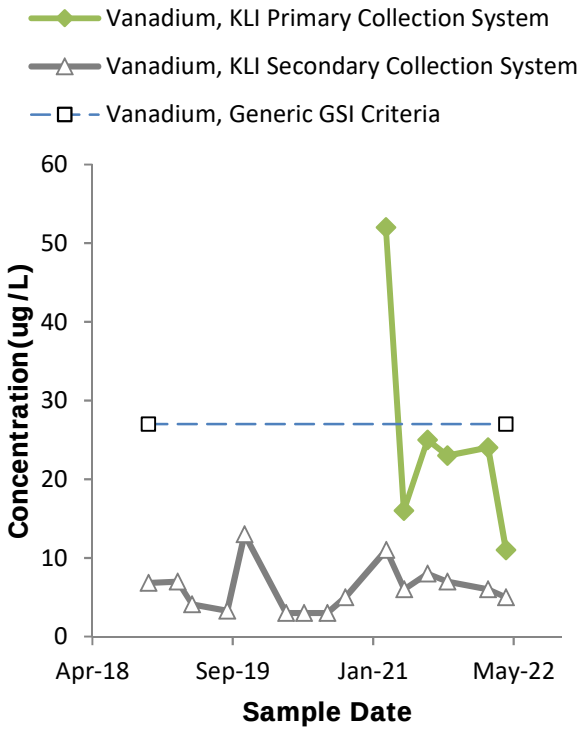


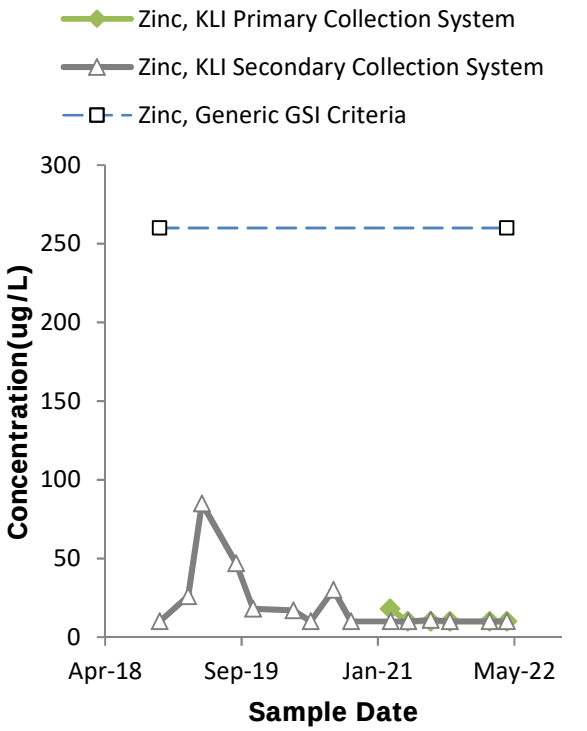




Water Quality Time Series

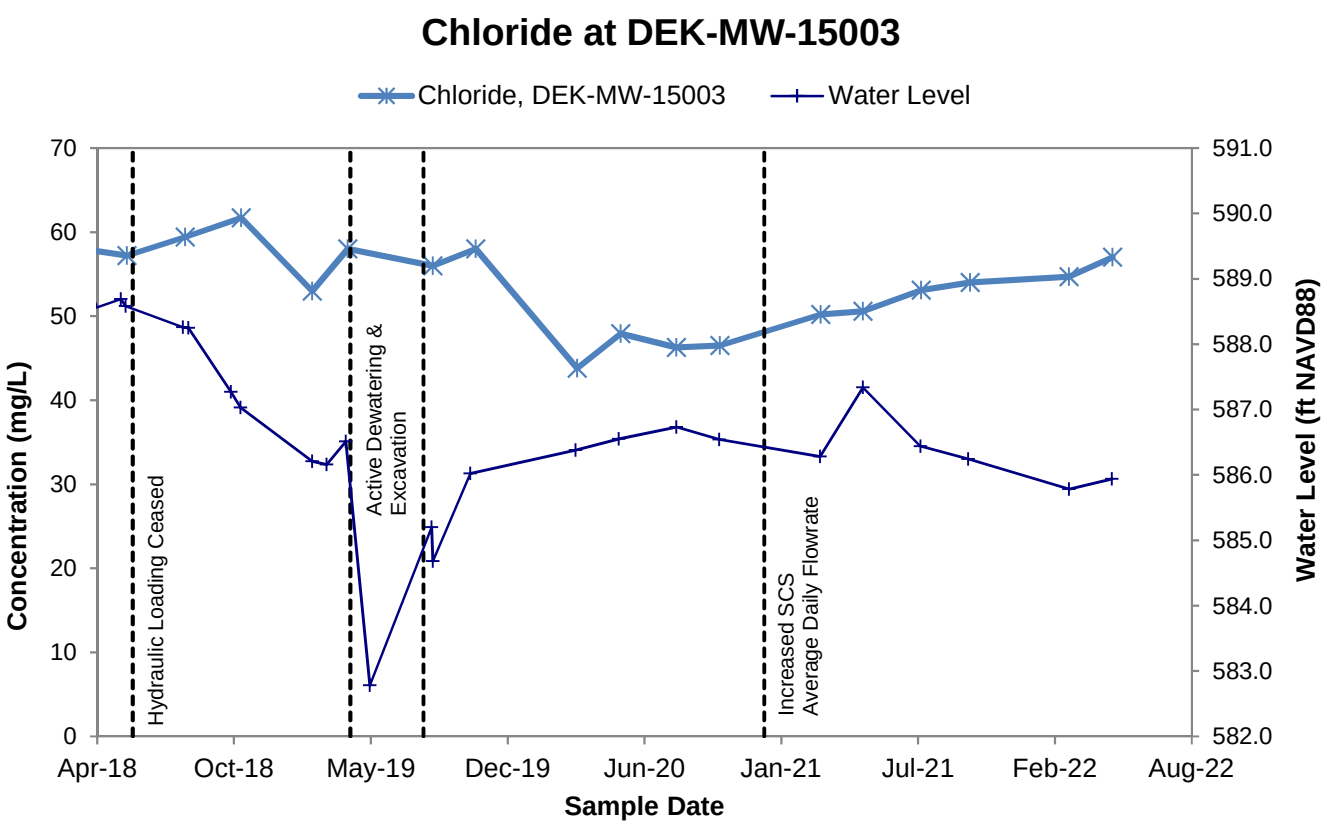






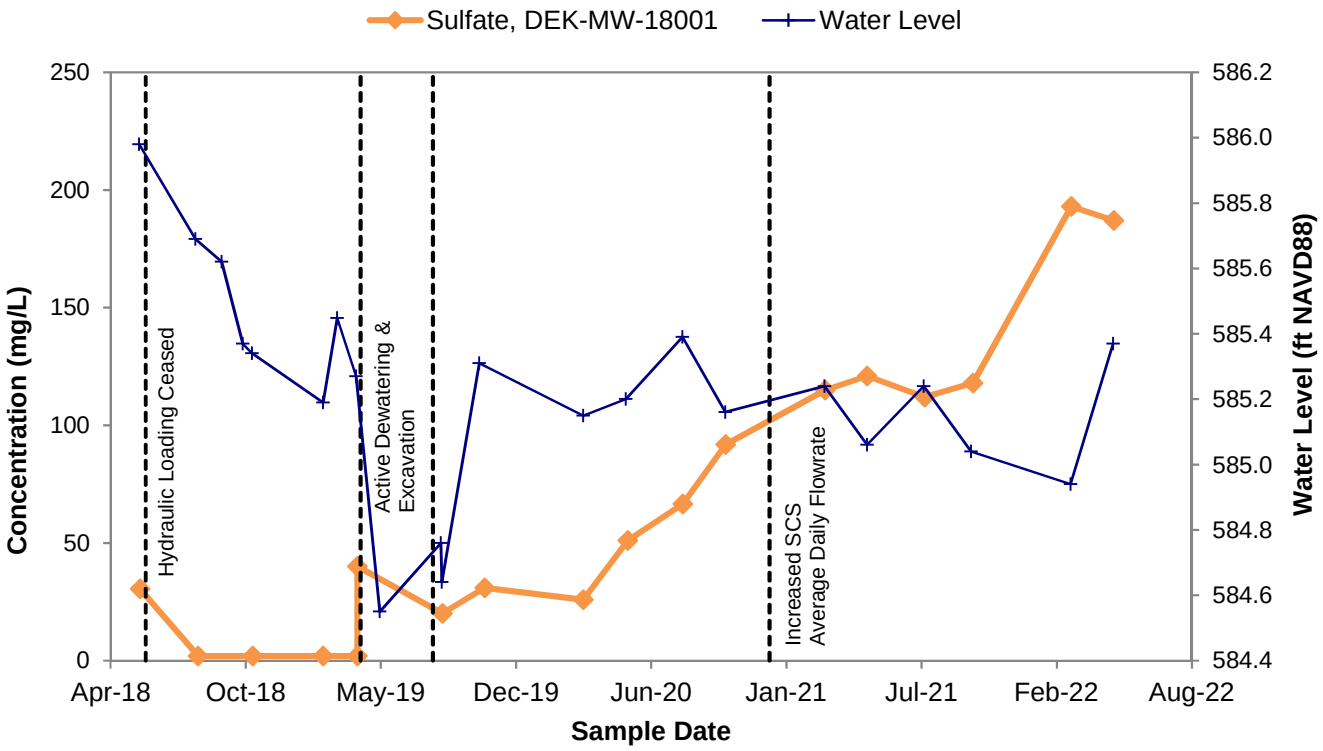
Appendix F
Alternate Source Demonstration

Alternate Source Demonstration Time Series

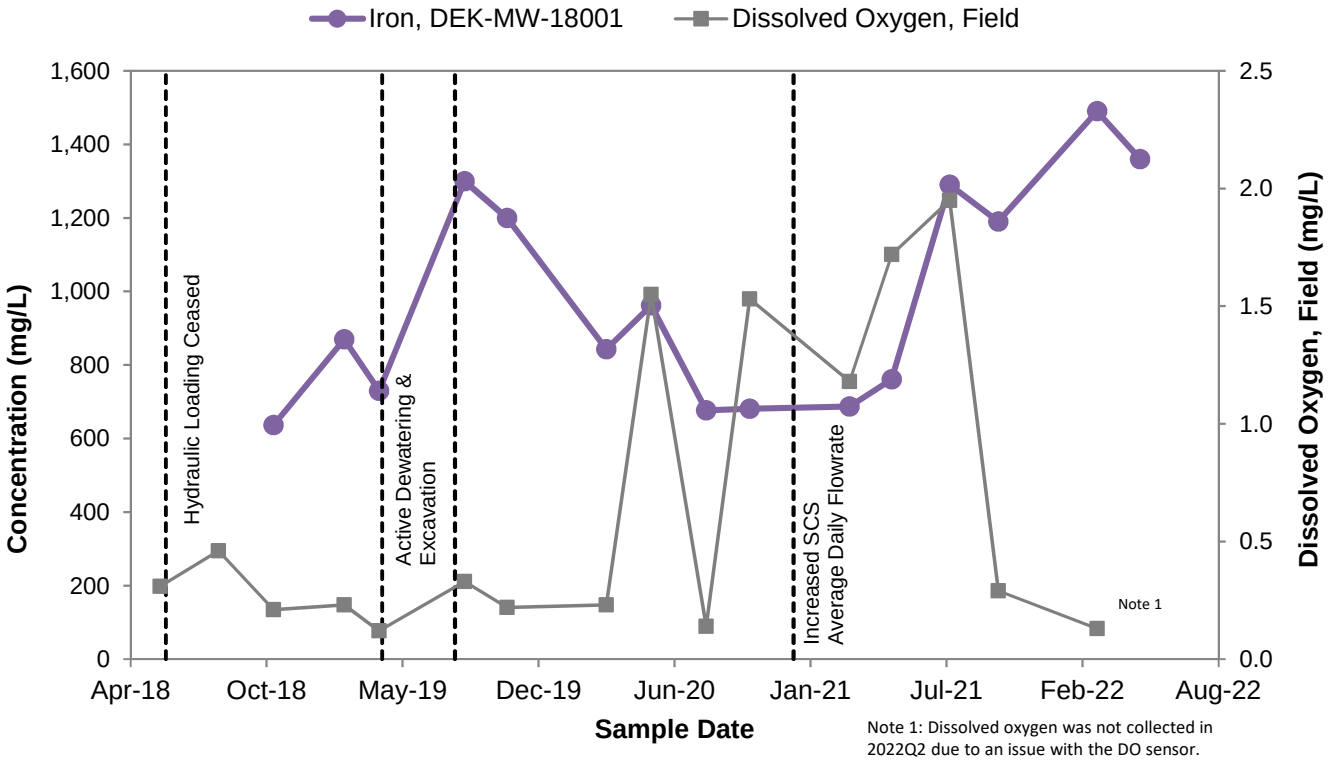


Alternate Source Demonstration Time Series

Sulfate at DEK-MW-18001



Iron at DEK-MW-18001



Note 1: Dissolved oxygen was not collected in 2022Q2 due to an issue with the DO sensor.

Third Quarter 2022 Hydrogeological Monitoring Report

DE Karn Lined Impoundment CCR Unit

Essexville, Michigan

October 2022

Prepared For:

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APPENDICES

1.0 Introduction

Pursuant to the Federal CCR Rule[1], Consumers Energy initiated a detection monitoring program for the Karn Lined Impoundment that went into service on June 7, 2018. After Consumers Energy established the groundwater monitoring system and detection monitoring program pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) on December 28, 2018 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 amendments to the solid waste statute amended state groundwater monitoring requirements for coal ash impoundments; therefore, Consumers Energy submitted the *Karn Lined Impoundment Hydrogeological Monitoring Plan* (HMP) 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 November 13, 2020 and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9629 issued on December 10, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This Third Quarter 2022 Karn Lined Impoundment Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring requirements during the active life of the coal ash impoundment. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, *Format for Solid Waste Disposal Facility Monitoring Submittals*, dated July 5, 2013. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the facility's approved HMP that was approved by the EGLE on November 13, 2020. This HMP is compliant with the requirements set forth in Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Protection Act (NREPA), also known as Part 115 of PA 451 of 1994, as amended (Part 115) (a.k.a., Michigan Part 115 Solid Waste Management).

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the third quarter 2022 at the Karn Lined Impoundment located at 2742 Weadock Highway in Essexville, Michigan (Figure 1). Groundwater in the vicinity of the Karn Lined Impoundment has been documented to be affected by the management of CCR prior to the construction of the unit (January 2019, TRC). Given that the constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, the compliance monitoring program for the Karn Lined Impoundment consists of two parts to evaluate if there are new releases from the unit:

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

1. Monitoring of secondary collection system flow rates and water quality to detect leaks in the liner; and
2. Groundwater monitoring to determine if there are potential new releases from the Karn Lined Impoundment.

Based on sampling results for the third quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP.

1.3 Site Overview

The Karn Lined Impoundment is located within the DE Karn Power Plant site (Site) located north of the former JC Weadock Power Plant, east of the Saginaw River, south and west of Saginaw Bay (Figure 1). Two coal-fired power generating units (Karn Units 1 & 2) began generating electricity in 1958 and 1959, respectively. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled. Two other areas of coal ash management within the Karn site are the former Karn Bottom Ash Pond that was closed by removal and the Karn Landfill that was certified closed and now in post-closure care.

1.4 Geology/Hydrogeology

The majority of the Karn Lined Impoundment area is comprised of surficial CCR and sand fill, as described in the HMP. USGS topographic maps and aerial photographs dating back to 1938, in addition to field descriptions of subsurface soil at the site, indicate that the site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

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

The Site is bound by several surface water features (Figures 1 and 2): the Saginaw River to the west, Saginaw Bay (Lake Huron) to the north and east, and a discharge channel to the south. In general, shallow groundwater is encountered at a similar or slightly higher elevation relative to the surrounding surface water features. Groundwater flow in the upper aquifer is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay. In the vicinity of the Karn Lined Impoundment, the shallow groundwater flow is generally radial, with a potentiometric high point near the unlined ditch north of the Karn Lined Impoundment and near DEK-MW-15003, flowing outward toward the surrounding surface water bodies.

2.0 Second Collection System Monitoring

Consumers Energy initiated secondary collection system flow monitoring to comply with the EGLE-approved HMP in December 2020. The SCS serves as a leak detection system and the SCS flow rate data is used to demonstrate compliance with Part 115. Consumers Energy continues to comply with the requirements for unmonitorable units under Rule 437 of the Part 115 Rules.

Increased average daily flow rates noted for the period from December 10, 2020 – January 6, 2021 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. Following repairs to the liner in 2021, the daily average flow rates were reduced, and the three-month average dropped below the response action flow rate of 25 gallons per acre per day (GPAD). The average daily flow rate for July through September 2022 (three-month average) was calculated as 20.2 GPAD and continues to demonstrate that the daily average flow rate is below the threshold value of the response action flow rate of 25 GPAD. Trend evaluations for weekly and monthly average flow rates continue to support that no additional engineering or operational modifications are necessary and Consumers continues to document this information in their operating record.

In response to the prior exceedance of the SCS Response Action Flow Rate, samples were collected from the surface water of the primary collection system (KLI-PCS) and from the secondary leachate collection system sump (KLI-SCS) in July 2022 to compare leachate chemistry to groundwater chemistry. The samples were analyzed for the following constituents:

- Primary Indicator Parameters: Section 11511a(3)(c) - Detection Monitoring Constituents
- Alternative Indicator Parameters: Section 11519b(2) - Assessment Monitoring Constituents
- Optional Analyses in support of Piper or Stiff diagrams

The KLI-PCS and KLI-SCS data were evaluated for comparison to groundwater quality and water chemistry and to also assess potential of hazard and mobility of constituents. A series of time-series plots are included in Appendix E to illustrate water quality data changes over time for the secondary collection system from the start of operation in June 2018 to present. This analysis demonstrates that each monitored constituent is generally present at concentrations less than the Groundwater Protection Standard (GWPS) established under 40 CFR 257.95(h) for the Karn Bottom Ash Pond or generic groundwater surface water interface (GSI) criteria adopted by the Department pursuant to Section 20120a, with the exception of total dissolved solids and chloride. A few notable observations:

- **Arsenic concentrations are higher in groundwater than the secondary collection system:** Arsenic was only detected in the secondary collection system at a concentration of 2 ug/L, in July 2022. In contrast, the arsenic concentration observed in OW-12, the monitoring well located closest to the damaged liner areas, is 111 ug/L, which is consistent with concentrations observed in August 2020, before the liner damage occurred. Arsenic present in groundwater does not appear to be a result of a release from the unit.
- **Vanadium is detected in the primary and secondary collection system and not in groundwater**: Vanadium was present in the primary collection system sample at 11 ug/L in May 2022 and 20 ug/L in July 2022, which are higher than the vanadium concentrations in

the secondary collection system (5 ug/L in May 2022 and 6 ug/L in July 2022). Vanadium was not detected in the wells nearest the observed liner damage: OW-12 (<2 ug/L) or DEK-MW-18001 (<2 ug/L) providing additional evidence that a release has not adversely affected groundwater conditions.

- **Secondary Collection System chemistry has not appreciably changed:** The time series plots in Appendix E show relatively stable trends in chemistry for samples collected from the primary and secondary collection systems, with the exception of TDS and sulfate in the secondary collection system. In both cases the concentration in the primary collection system leachate is significantly lower in concentration than the concentration in the secondary collection system leachate, suggesting that the elevated TDS and sulfate is not likely from the primary collection system leachate. The TDS and sulfate concentrations in the secondary collection system are also more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products.

Water quality data collected for third quarter 2022 are included in the attached laboratory reports (Appendix A). Groundwater chemistry is discussed in Section 4.1. Groundwater conditions will continue to be monitored.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

In accordance with §257.91, Consumers Energy developed a groundwater monitoring system for the Karn Lined Impoundment prior to the initial receipt of waste in the CCR unit (TRC, 2018c). Given the radial groundwater flow direction and that constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the Karn Bottom Ash Pond, the groundwater monitoring system design incorporates an intrawell statistical approach for detection monitoring as described in the HMP and in accordance with the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance" (USEPA, 2009). Five monitoring wells that are screened in the uppermost saturated unit were selected for the Karn Lined Impoundment HMP detection monitoring (DEK-MW-15003, DEK-MW-18001, OW-10, OW-11, and OW-12). Monitoring well locations are shown on Figure 2.

3.2 July 2022 Detection Monitoring Event

In accordance with the HMP, TRC conducted the third quarter 2022 monitoring event for the Karn Lined Impoundment on July 25thand July 26th, 2022. In addition to the routine groundwater samples collected from the monitoring well network, a water sample was collected from a sump in the secondary collection system (KLI-SCS) and a surface water sample was collected from the primary collection system (KLI-PCS), as discussed in Section 2 above, such that leachate chemistry could be compared to groundwater chemistry. A sample of surface water was also collected from a ditch located north of the lined impoundment (SW-Ditch) to further evaluate site geochemistry (Figure 2). The SW-Ditch surface water grab sample represents water quality from the potentiometric high point adjacent to the Karn Lined Impoundment.

Groundwater samples collected during the July 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	Section 11519b(2) – Assessment Monitoring Constituents		
Boron	Antimony	Fluoride	Thallium
Calcium	Arsenic	Lead	Vanadium
Chloride	Barium	Lithium	Zinc
Fluoride	Beryllium	Mercury	
Iron	Cadmium	Molybdenum	
pH	Chromium, total	Nickel	
Sulfate	Cobalt	Selenium	
Total Dissolved Solids (TDS)	Copper	Silver	

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, and bicarbonate, carbonate, and total alkalinity to provide further evaluation of groundwater chemistry. Analytical results from the third quarter 2022 monitoring event are included in the attached laboratory reports (Appendix A).

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

Monitoring wells were purged with peristaltic pumps utilizing low-flow sampling methodology. Field parameters were stabilized at each monitoring well prior to collecting groundwater samples. Stabilized field parameters for each monitoring well are summarized in Table 2. Field notes are included as Appendix B. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Porewater sample preparation and analyses were performed in accordance with SW-846 "Test Methods for Evaluation Solid Waste – Chemical / Physical Methods," USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of one field blank, one equipment blank, one field duplicate (OW-12), and field matrix spike/matrix spike duplicate samples collected at DEK-MW-18001.

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the HMP program. The data quality reviews for the Karn Lined Impoundment network wells are summarized in Appendix C.

3.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the third quarter 2022 groundwater monitoring event are provided in Table 1. The data were used to construct the groundwater contour map (Figure 3).

Groundwater elevations measured at the site in July 2022 are generally within the range of 577 to 586 feet above mean sea level (ft NAVD88) and groundwater is typically encountered at equal elevation relative to the surrounding surface water features measured by the NOAA gauging station data or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although the point source discharge of sluiced bottom ash into the former Karn Bottom Ash Pond historically created localized mounding of the potentiometric surface, the new Karn Lined Impoundment went into service on June 7, 2018 and has been continuously collecting the process water and bottom ash that went into the former bottom ash pond. Since the former bottom ash pond is no longer being hydraulically loaded with sluiced ash and has been dewatered by gravity, the characteristic groundwater mound centered within the former surface pool area is no longer present. The groundwater elevation data collected in the vicinity of the former Karn Bottom Ash Pond in July 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to measurement taken in June 2018. Groundwater at the Site is locally influenced by incidental infiltration from precipitation over the uncovered acreage and the unlined low volume miscellaneous wastewater conveyance associated with the permitted NPDES discharge system, which is located just north of the Karn Lined Impoundment. Monitoring wells OW-11 and DEK-MW-15003 delineate the newly established groundwater elevation high point that was previously centered over the former Karn Bottom Ash Pond with porewater flow generally flowing radially towards the adjacent surface water features from this newly established potentiometric “high”, as illustrated in Figure 3.

The average hydraulic gradient observed on July 25, 2022 in the vicinity of the former Karn Bottom Ash Pond and Karn Lined Impoundment is estimated at 0.0047 ft/ft. The gradients were calculated using the monitoring well pairs DEK-MW-15004/DEK-MW-15005, DEK-MW-15003/DEK-MW-15006, and OW-11/MW-08, as well as the monitoring well water elevation difference and distance between DEK-MW-18001 and the discharge channel. The discharge channel surface water elevation was taken from the NOAA gauging station data on the same date as the water level measurements. Using the mean hydraulic conductivity of 15 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.3, the estimated average seepage velocity was calculated to be 0.23 ft/day or 84 ft/year in July 2022 which is reduced relative to previous estimated seepage velocities (e.g., 0.33 ft/day or 120 ft/year August 2018).

Due to the operational changes of the former bottom ash pond and the completion of the landfill capping activities in 2020, the gradient between the area of the Karn Bottom Ash Pond and Karn Lined Impoundment and the surrounding surface water bodies is flattening out as compared to previous quarters and is also attempting to reach a new equilibrium, as expected. The general flow direction relative to the Karn Lined Impoundment is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III/IV parameters that could potentially migrate from the Karn Lined Impoundment.

4.0 Data Evaluation

Based on sampling results for the third quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP. The following section summarizes the statistical approach applied to assess the third quarter 2022 groundwater data in accordance with the detection monitoring program.

Water quality data are included in the attached laboratory reports (Appendix A). Groundwater analytical data for the most recent quarterly monitoring event is summarized in Table 3 along with the associated Part 201 generic drinking water criteria and the generic GSI criteria. GSI compliance is evaluated through monitoring performed at the Karn Landfill in accordance with the EGLE-approved Consumers Energy's revised Karn Landfill HMP (Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area) dated December 19, 2017 and in accordance with the December 23, 2015 mixing zone determination.

4.1 Statistical Evaluation of Trends

Groundwater in the vicinity of the Karn Lined Impoundment has been affected by CCR management before commencement of operation (January 2019, TRC). Given that the constituents associated with CCR currently managed in the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, intrawell trend tests, in conjunction with KLI-SCS flow rates, will be utilized to assess whether a release has occurred from operation of the unit. The detection monitoring constituent concentrations will be analyzed using Mann-Kendall and Sen's Slope trend tests to determine if there is an upward trend that may indicate a release from the Karn Lined Impoundment. The data will be analyzed in the context of the Site hydrogeologic characteristics and an assessment made as to whether the source of an upward trend, if identified, is from a possible release from the Karn Lined Impoundment, another on-site release, or on-site migration of nearby impact (i.e., former Karn Bottom Ash Pond).

Time-series plots and statistical trend analyses are used to evaluate groundwater quality each quarter, which are included as Appendix D. Consumers Energy manages and evaluates its analytical data using Sanitas™ Statistical Software (Sanitas™). Consumers Energy conducts intra-well trend analyses to examine data for each monitoring well-constituent pair in the groundwater monitoring system over time to determine if changes in water quality are occurring that may be associated with the Karn Lined Impoundment. Data from October 2020 through July 2022 were analyzed using Mann-Kendall and Sen's Slope at a significance level (α) of 0.025 per tail for each constituent/sampling point dataset to assess trends. Sen's Slope estimator was used to assess the magnitude of the slope and the Mann-Kendall test was used to determine if the slope was statistically significant. The graphical output of the Sen's Slope/Mann-Kendall trend tests and time series are presented in Appendix D. Appendix D also includes a table summarizing these trends and the associated statistical trend charts.

Data trends for detection monitoring constituents are generally stable (i.e., no trend) or declining for the majority of the monitoring well/constituent pairs with the following exceptions:

- The increasing trend in chloride concentrations continued to be observed in monitoring well DEK-MW-15003.
- The new, unconfirmed increasing trend for chloride at OW-12 that was observed in Q2 2022 was not confirmed in Q3 2022.
- The increasing trend observed for sulfate at DEK-MW-18001 that was previously observed from Q3 2021 to Q2 2022 did not continue in Q3 2022. Concentrations of sulfate have decreased since Q1 2022 at DEK-MW-18001 and are no longer exhibiting a statistically significant increasing trend.
- The previously confirmed increasing trend for iron at DEK-MW-18001 in Q2 2022 did not continue to increase in Q3 2022.
- A new, unconfirmed increasing trend for total dissolved solids was observed at DEK-MW-15003 in Q3 2022.
- Continuous increasing trends were observed for boron and pH in monitoring well OW-11.

4.2 Detection Monitoring Data Discussion

Groundwater quality is generally consistent with previous monitoring events and the majority of the well/constituent pairs are exhibiting no trend or decreasing concentrations. Although increasing trends of detection monitoring (Appendix III) constituents exist, the groundwater conditions do not conclusively indicate a release from the unit, as discussed further in Section 4.3. The location of one of the identified liner damage locations was approximately 40-ft upgradient from monitoring well OW-12 and the second location was approximately 130-ft upgradient from monitoring well DEK-MW-18001. Both leaks have been repaired. Detection monitoring constituent concentrations at OW-12, located closest to the identified liner damage, exhibit no statistically significant increasing trends, indicating that if a release to groundwater occurred due to the apparent leak in the liner system, the effects on local groundwater quality at this point appear to be negligible. The increasing trends at noted in section 4.1 will continue to be evaluated within context of changes in the site operational status.

4.3 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed in the First Quarter 2022 Hydrogeological Monitoring Report (TRC, April 2022):

- Boron and pH in monitoring well OW-11; and
- Chloride in monitoring well DEK-MW-15003.

Although increasing trends of detection monitoring (Appendix III) constituents exist, as noted in Section 4.1, the groundwater conditions do not conclusively indicate a release from the unit for several reasons as detailed below.

Timing of Changes in Concentrations

Time-series plots included in Appendix F illustrate that the change in chloride at DEK-MW-15003 is likely a result of changes in the groundwater flow regime or redox conditions as a result of the Bottom Ash Pond closure activities, rather than a result of a release from the unit.

- Chloride at DEK-MW-15003 initially decreased after the Bottom Ash Pond closure activities. In early 2020, chloride concentrations began to increase and appear to be approaching the concentrations observed pre-construction. The slight increase in chloride began before the noted leak in the Karn Lined Impoundment liner system was observed; therefore, the recent increase in concentrations is not due to a release from the unit.

Groundwater Flow Direction

OW-11 and DEK-MW-15003 are not located downgradient of either area of the noted liner damage, due to the position of the wells relative to the groundwater elevation high point, as shown in Figure 3. Furthermore, OW-11 has distinct chemistry as compared to the KLI-SCS data as shown in Table 3. Boron, which can be used as a conservative tracer, is nearly six times higher in OW-11 than what has been observed in the KLI-SCS samples. The pH observed at OW-11 is 2 standard units higher than what is observed in the KLI-SCS sample and other nearby wells, which indicate a source other than the Karn Lined Impoundment is influencing chemistry at OW-11.

Leachate Chemistry

Analysis of the KLI-PCS and KLI-SCS data provide additional lines of evidence to support a source other than the unit is contributing to groundwater conditions.

- Arsenic concentrations are higher in groundwater than in the secondary collection system; therefore, arsenic present in groundwater does not appear to be a result of a release from the unit (Section 2.0).
- Vanadium is detected in the primary and secondary collection system and not in groundwater in the wells nearest the observed liner damage OW-12 or DEK-MW-18001 (<2 ug/L), providing additional evidence that a release has not adversely affected groundwater conditions.

5.0 Conclusions and Recommendations

Consumers Energy will continue the detection monitoring program for the Karn Lined Impoundment unit based on the data evaluations completed in Section 4.0 of this report in conformance with the Karn Lined Impoundment HMP. Although increasing trends for detection monitoring constituents were observed in two wells in Q3 2022, these trends were found to not be a result of operation of the Karn Lined Impoundment. No SSIs over background limits were identified at the Karn Lined Impoundment during the July 2022 monitoring event. The use of secondary collection system flow rates as a leak detection system was successful. Increased flow rates observed in Q4 2020 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. The results of the mitigation efforts continue to be monitored and recent data demonstrate that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021. The fourth quarter monitoring event is scheduled for October 2022.

6.0 References

AECOM. October 30, 2009. Potential Failure Mode Analysis (PFMA) Report. DE Karn Electric Generation Facility Ash Dike Risk Assessment Essexville, Michigan. Prepared for Consumers Energy Company.

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TRC. April 2022. First Quarter 2022 Hydrogeological Monitoring Report for the DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. Prepared for Consumers Energy Company.

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USEPA. July 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435).

Tables

Table 1
Summary of Groundwater Elevation Data
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)	July 25, 2022	
				Depth to Water (ft BTOC)	Groundwater Elevation (ft)
DEK Bottom Ash Pond					
DEK-MW-15002	590.87	Sand	578.3 to 575.3	6.93	583.94
DEK-MW-15005	589.72	Sand	572.3 to 567.3	9.24	580.48
DEK-MW-15006	589.24	Sand	573.0 to 568.0	8.73	580.51
DEK Bottom Ash Pond & Karn Lined Impoundment					
DEK-MW-18001	593.47	Sand	579.2 to 574.2	8.15	585.32
Karn Lined Impoundment					
DEK-MW-15003	602.74	Sand	578.8 to 574.8	16.76	585.98
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	6.41	585.17
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	22.08	585.82
OW-12	603.10	Silty Sand	584.2 to 579.2	17.21	585.89
DEK Nature and Extent					
DEK-MW-15004	611.04	Sand	576.6 to 571.6	28.28	582.76
MW-01	597.02	Sand	573.0 to 570.0	16.73	580.29
MW-03	597.30	Sand	569.8 to 566.8	16.95	580.35
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	9.20	580.24
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	17.85	580.93
MW-10	596.97	Sand	582.5 to 572.5	16.31	580.66
MW-12	598.60	Sand	583.9 to 573.9	18.15	580.45
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	13.88	580.49
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	15.31	580.49
MW-22	598.99	Ash/Sand	571.4 to 568.4	16.96	582.03
MW-23	595.57	Ash/Sand	576.9 to 571.9	13.93	581.64
DEK Static Water Level					
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	17.02	580.32
MW-04	598.01	NR	569.5 to 564.5	17.64	580.37
MW-17	597.91	Sand	577.0 to 574.0	12.96	584.95
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	25.96	583.26
MW-19	597.28	NR	572.1 to 567.1	16.58	580.70
MW-20	632.75	Sand	582.3 to 579.3	52.58	580.17
MW-21	632.91	Sand	587.1 to 584.1	51.49	581.42
OW-01	631.33	NR	572.5 to 567.5	51.17	580.16
OW-02	598.01	Fly Ash	579.4 to 576.4	15.84	582.17
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	16.92	581.02
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	9.80	580.41
OW-05	593.53	Sand	576.9 to 571.9	16.00	577.53
OW-06	603.95	NR	580.9 to 575.9	22.10	581.85
OW-07	596.41	Ash	583.3 to 580.3	14.85	581.56
OW-08	593.93	NR	581.0 to 576.0	10.81	583.12
OW-09	593.45	NR	585.5 to 580.5	10.35	583.10
OW-13	588.52	NR	579.5 to 574.5	4.27	584.25
OW-15	587.75	NR	572.8 to 567.8	3.81	583.94

Notes:

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

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

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

NR: Not Recorded

Table 2
Summary of Field Parameters: July 2022
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Karn Lined Impoundment							
DEK-MW-15003	7/26/2022	0.70	-153.9	8.1	385	19.0	0.9
DEK-MW-18001	7/26/2022	0.16	-143.3	7.4	694	14.0	2.0
KLI-PCS	7/26/2022	8.30	84.0	8.6	578	25.4	5.6
KLI-SCS	7/26/2022	3.00	64.4	7.3	1,793	21.2	8.6
OW-10	7/26/2022	0.50	-129.1	7.2	679	13.0	24.2
OW-11	7/26/2022	1.10	-58.7	9.8	326	13.6	3.2
OW-12	7/26/2022	0.60	-116.7	7.1	743	15.5	1.8
SW-DITCH	7/26/2022	7.40	127.5	8.1	717	28.5	18.4

Notes:
mg/L - Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit.
-- = Parameter Not Measured

Table 3
Summary of Groundwater Sampling Results (Analytical): July 2022
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**	**KLI-SCS**	**KLI-PCS**	**SW-DITCH**
					Sample Date:	7/26/2022	7/26/2022	7/26/2022	7/26/2022	7/26/2022	7/26/2022	7/26/2022	7/26/2022
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Upgradient	Downgradient		Upgradient	Downgradient	Supplemental		
Appendix III[(1)]													
Boron	ug/L	NC	**500**	**500**	4,000	**773**	**945**	**1,090**	**3,330**	**1,230**	**612**	**568**	214
Calcium	mg/L	NC	NC	NC	500[EE]	27.1	62.4	101	5.33	84.8	101	45.8	50.2
Chloride	mg/L	250**	250[E]	250[E]	**50**	**58.6**	**62.7**	**58**	**61.6**	**55.5**	**56.6**	**72.7**	**81.1**
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	2,710	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	500[EE]	39.3	127	2.67	19.9	169	**423**	53.1	33.3
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	272	**532**	**568**	235	**601**	**1,280**	330	362
pH, Field	SU	**6.5 - 8.5****	**6.5 - 8.5[E]**	**6.5 - 8.5[E]**	**6.5 - 9.0**	8.1	7.4	7.2	**9.8**	7.1	7.3	**8.6**	8.1
Appendix IV[(1)]													
Antimony	ug/L	6	6.0	6.0	**2.0**	< 1	< 1	< 1	**4**	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	**475**	**89**	2	**682**	**111**	2	3	4
Barium	ug/L	2,000	2,000	2,000	1,200	40	137	163	17	90	63	419	394
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	1	2	< 1	< 1	< 1	2	2
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	2,710	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	20	22	27	< 10	36	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	**73**	210	**120**	23	< 5	< 5	**173**	17	11	21	9
Selenium	ug/L	50	50	50	5.0	1	< 1	2	5	1	4	1	1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]													
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	169	**1,090**	**3,350**	31	**6,080**	92	**597**	**655**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	< 1	< 1	3	< 1	< 1	4	3	7
Nickel	ug/L	NC	100	100	120	< 2	< 2	3	2	< 2	6	3	3
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	**4.5**	**62**	**27**	< 2	< 2	**5**	**1,500**	< 2	**6**	**20**	**9**
Zinc	ug/L	5,000**	2,400	5,000[E]	260	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10

Notes:

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

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

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

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.

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

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

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

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

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

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

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

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

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Statistical Exceedances – July 2022
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

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

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

Facility: Karn Lined Impoundment – WDS# 392503

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	3 Qtr. 2022 (**bold** >201)	2 Qtr. 2022 (**bold** >201)	1 Qtr. 2022 (**bold** >201)	4 Qtr. 2021 (**bold** >201)

No Exceedances

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
DE KARN AND JC WEADOCK POWER PLANTS
ESSEXVILLE, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	A. ADAIR
CHECKED BY:	J. KRENZ
APPROVED BY:	D. LITZ
DATE:	OCTOBER 2022
PROJ. NO.:	464095.0001
FILE:	464095-103-001.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\1_DEKARN\2022_MXDs\Q3_2022_OCTOBER\464095-103-001.mxd -- Saved By: AADAIR on 10/11/2022, 11:30:45 AM

LEGEND

- MONITORING WELL (STATIC WATER LEVEL
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SECONDARY CONTAINMENT SUMP (KLI-SCS)
- PRIMARY CONTAINMENT SYSTEM SAMPLE (KLI-PCS)
- SURFACE WATER SAMPLE (SW-DITCH)
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02, MW-03/MW-04, OW-02/MW-22, AND OW-07/MW-23 AS THE WELLS ARE LOCATED WITHIN 15-FT OF EACH OTHER.

N

0 600 1,200 Feet

1 " = 600 '
1:7,200

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

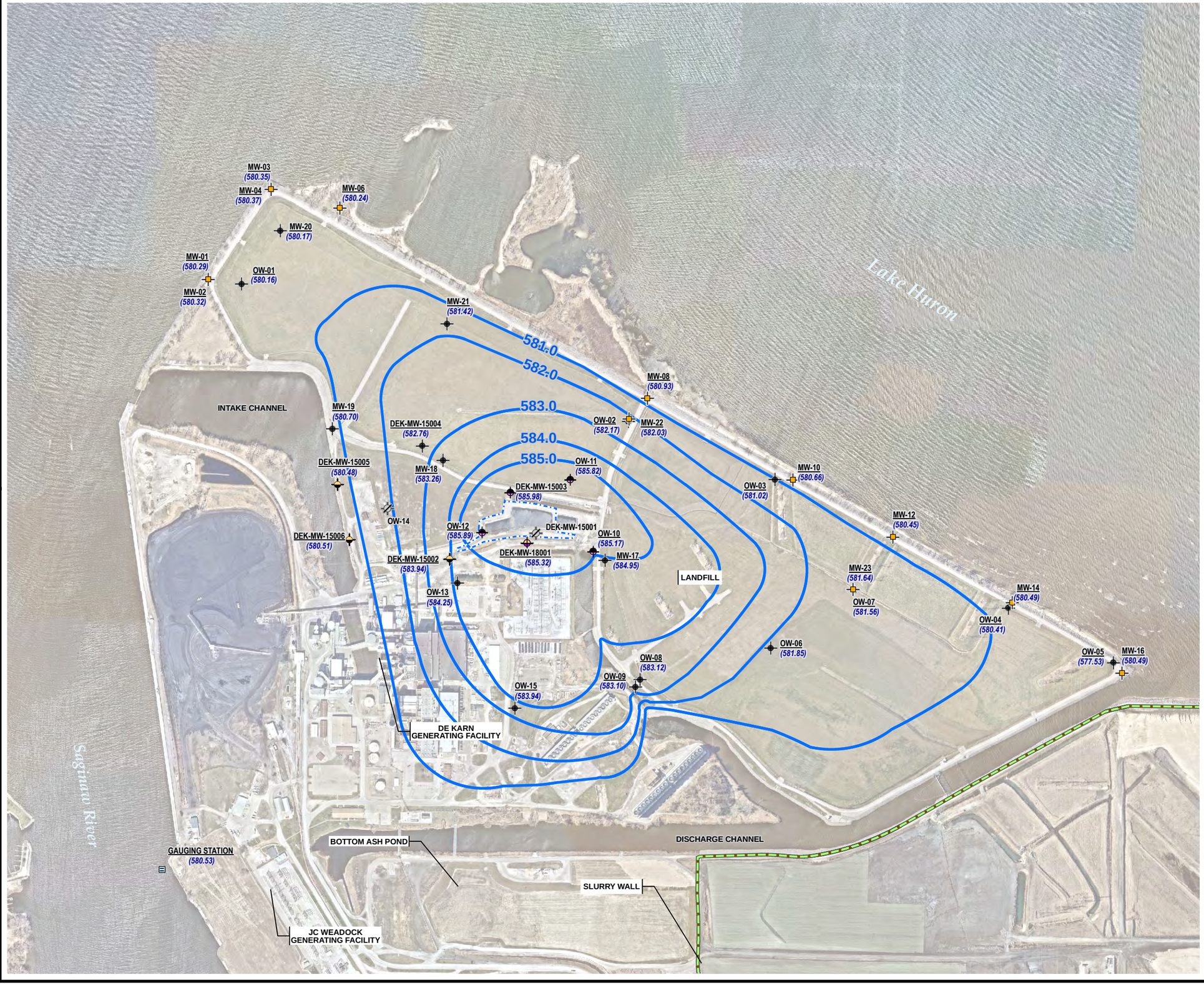
TITLE:
SITE LAYOUT MAP

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 2**
DATE:	OCTOBER 2022		

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

FILE NO.: 464095-103-002a.mxd

Plot Date: 10/11/2022, 10:00:34 AM by AADAIR -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 26976\1 DEKARN\2022 MXDs\Q3 2022 OCTOBER\464095-103-002a.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS



LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)
- *(580.50)* GROUNDWATER ELEVATION (FEET)
- *(NU)* NOT USED

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
CONSUMERS ENERGY COMPANY
DE KARN POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE:
SHALLOW GROUNDWATER CONTOUR MAP JULY 2022

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 3**
DATE:	OCTOBER 2022		

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

FILE NO.: 464095-103-003.mxd

Plot Date: 10/11/2022, 12:21:20 PM by AADAIR -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 269767\1 DEKARN\2022 MXDs\Q3 2022 OCTOBER\464095-103-003.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

Appendix A
Laboratory Analytical Reports

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: August 12, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN LINED IMPOUNDMENT – 2022 Q3

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0770

TRC Environmental, Inc. conducted groundwater monitoring at the DE Karn Lined Impoundment area on 07/26/2022 for the 3rd Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 07/27/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted in 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: Karn/Weadock Complex
Work Order ID: Q3-2022 DEK Lined Impoundment
Date Received: 7/27/2022
Chemistry Project: 22-0770

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0770-01	DEK-MW-15003	Groundwater	07/26/2022 01:46 PM	DEK Lined Impoundment
22-0770-02	OW-10	Groundwater	07/26/2022 11:29 AM	DEK Lined Impoundment
22-0770-03	OW-11	Groundwater	07/26/2022 12:33 PM	DEK Lined Impoundment
22-0770-04	OW-12	Groundwater	07/26/2022 10:31 AM	DEK Lined Impoundment
22-0770-05	KLI-SCS	Groundwater	07/26/2022 09:49 AM	DEK Lined Impoundment
22-0770-06	KLI-PCS	Surface Water	07/26/2022 09:39 AM	DEK Lined Impoundment
22-0770-07	SW-DITCH	Surface Water	07/26/2022 09:05 AM	DEK Lined Impoundment
22-0770-08	DUP-KLI	Groundwater	07/26/2022 12:00 AM	DEK Lined Impoundment
22-0770-09	EB-KLI	Water	07/26/2022 02:00 PM	DEK Lined Impoundment
22-0770-10	FB-KLI	Water	07/26/2022 11:29 AM	DEK Lined Impoundment

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-0770-01
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 01:46 PM

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

Aliquot #: 22-0770-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	475		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	40		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	773		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	27100		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	169		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	20		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	4520		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	65		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	23		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	4030		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	1		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	49300		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-01-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	58600		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-0770-01
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 01:46 PM

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

Aliquot #: 22-0770-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	39300		ug/L	1000.0	07/27/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-01-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2320		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-01-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	272		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0770-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	84800		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	84800		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	180		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3700		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5100		ug/L	1000.0	08/05/2022	AB22-0812-22

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0770-02
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 11:29 AM

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

Aliquot #: 22-0770-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	2		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	163		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	1090		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	101000		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	2		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	3		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	3350		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	1		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	27		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	16900		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	321		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	3		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	5330		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	2		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	60700		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	5		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-02-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	58000		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0770-02
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 11:29 AM

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

Aliquot #: 22-0770-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	2670		ug/L	1000.0	07/27/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-02-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	4800		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-02-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	568		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0770-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	402000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	402000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	110		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	7900		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	9400		ug/L	1000.0	08/05/2022	AB22-0812-22

Metals by EPA 6020B: CCR Rule Appendix III-IV Diss Metals Expa

Aliquot #: 22-0770-02-C10-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/11/2022	AB22-0811-08
Arsenic	2		ug/L	1.0	08/11/2022	AB22-0811-08
Barium	140		ug/L	5.0	08/11/2022	AB22-0811-08
Beryllium	ND		ug/L	1.0	08/11/2022	AB22-0811-08
Boron	1170		ug/L	20.0	08/11/2022	AB22-0811-08

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-0770-02
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 11:29 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Diss Metals Expa

Aliquot #: 22-0770-02-C10-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Cadmium	ND		ug/L	0.2	08/11/2022	AB22-0811-08
Calcium	96500		ug/L	1000.0	08/11/2022	AB22-0811-08
Chromium	3		ug/L	1.0	08/11/2022	AB22-0811-08
Cobalt	ND		ug/L	6.0	08/11/2022	AB22-0811-08
Copper	ND		ug/L	1.0	08/11/2022	AB22-0811-08
Iron	2410		ug/L	20.0	08/11/2022	AB22-0811-08
Lead	ND		ug/L	1.0	08/11/2022	AB22-0811-08
Lithium	27		ug/L	10.0	08/11/2022	AB22-0811-08
Magnesium	17400		ug/L	1000.0	08/11/2022	AB22-0811-08
Manganese	320		ug/L	5.0	08/11/2022	AB22-0811-08
Molybdenum	ND		ug/L	5.0	08/11/2022	AB22-0811-08
Nickel	5		ug/L	2.0	08/11/2022	AB22-0811-08
Potassium	7360		ug/L	100.0	08/11/2022	AB22-0811-08
Selenium	2		ug/L	1.0	08/11/2022	AB22-0811-08
Silver	ND	K	ug/L	0.3	08/11/2022	AB22-0811-08
Sodium	61800		ug/L	1000.0	08/11/2022	AB22-0811-08
Thallium	ND		ug/L	2.0	08/11/2022	AB22-0811-08
Vanadium	2		ug/L	2.0	08/11/2022	AB22-0811-08
Zinc	ND		ug/L	10.0	08/11/2022	AB22-0811-08

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-0770-03
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 12:33 PM

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

Aliquot #: 22-0770-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	4		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	682		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	17		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	3330		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	5330		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	31		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	ND		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	173		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	2		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	4010		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	5		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	65300		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	1500		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-03-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	144		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	135		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	61600		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-0770-03
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 12:33 PM

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

Aliquot #: 22-0770-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	2710		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	19900		ug/L	1000.0	07/27/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-03-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	7810		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-03-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	235		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0770-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	90900		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	18200		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	72700		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	6000		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6700		ug/L	1000.0	08/05/2022	AB22-0812-22

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-0770-04
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 10:31 AM

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

Aliquot #: 22-0770-04-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	111		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	90		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	1230		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	84800		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	6080		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	36		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	31900		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	175		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	17		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	5420		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	1		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	60900		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-04-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-04-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	55500		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-0770-04
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 10:31 AM

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

Aliquot #: 22-0770-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	169000		ug/L	1000.0	08/04/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-04-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	768		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-04-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	601		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0770-04-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	217000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	217000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-04-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-04-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2300		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-04-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	2600		ug/L	1000.0	08/05/2022	AB22-0812-22

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-0770-05
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 09:49 AM

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

Aliquot #: 22-0770-05-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	2		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	63		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	612		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	101000		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	4		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	92		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	ND		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	35300		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	11		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	6		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	4070		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	4		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	322000		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	6		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-05-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-05-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1370		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	56600		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-0770-05
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 09:49 AM

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

Aliquot #: 22-0770-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	423000		ug/L	1000.0	08/04/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-05-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-05-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1280		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0770-05-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	550000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	550000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-05-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-05-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2900		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-05-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4400		ug/L	1000.0	08/05/2022	AB22-0812-22

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-0770-06
Matrix: Surface Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 09:39 AM

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

Aliquot #: 22-0770-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	3		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	419		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	568		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	45800		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	2		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	3		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	597		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	ND		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	13000		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	18		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	21		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	3		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	3160		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	1		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	53000		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	20		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-06-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-06-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	160		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	72700		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-0770-06
Matrix: Surface Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 09:39 AM

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

Aliquot #: 22-0770-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	53100		ug/L	1000.0	07/27/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-06-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	654		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-06-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	330		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0770-06-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	115000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	100000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	15200		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-06-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-06-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2900		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-06-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4100		ug/L	1000.0	08/05/2022	AB22-0812-22

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-0770-07
Matrix: Surface Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 09:05 AM

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

Aliquot #: 22-0770-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	4		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	394		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	214		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	50200		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	2		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	7		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	655		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	ND		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	16700		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	43		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	9		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	3		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	3070		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	1		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	54900		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	9		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-07-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-07-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	253		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	81100		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-0770-07
Matrix: Surface Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 09:05 AM

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

Aliquot #: 22-0770-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	33300		ug/L	1000.0	07/27/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-07-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	460		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-07-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	362		mg/L	10.0	07/28/2022	AB22-0728-05

Alkalinity by SM 2320B

Aliquot #: 22-0770-07-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	156000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	153000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-07-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-07-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	5000		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-07-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5700		ug/L	1000.0	08/05/2022	AB22-0812-22

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-0770-08
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-0770-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	108		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	89		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	1150		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	81700		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	5740		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	36		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	30700		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	174		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	17		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	3		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	5090		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	2		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	59600		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-08-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-08-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0770-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	55800		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-0770-08
Matrix: Groundwater

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-0770-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	170000		ug/L	1000.0	08/04/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-08-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	704		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0770-08-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	592		mg/L	10.0	07/28/2022	AB22-0728-05

Alkalinity by SM 2320B

Aliquot #: 22-0770-08-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	218000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	218000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-08-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-08-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2200		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-08-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	2600		ug/L	1000.0	08/05/2022	AB22-0812-22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-0770-09
Matrix: Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 02:00 PM

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

Aliquot #: 22-0770-09-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	ND		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	ND		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	ND		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	ND		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-09-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-09-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-09-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	08/09/2022	AB22-0809-04

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-0770-09
Matrix: Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 02:00 PM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-09-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-09-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-09-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	08/05/2022	AB22-0812-22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-0770-10
Matrix: Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 11:29 AM

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

Aliquot #: 22-0770-10-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	ND		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	ND		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	ND		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	ND		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	ND		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0770-10-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0770-10-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0770-10-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	08/09/2022	AB22-0809-04

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-0770-10
Matrix: Water

Laboratory Project: **22-0770**
Collect Date: 07/26/2022
Collect Time: 11:29 AM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0770-10-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-10-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	08/05/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0770-10-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	1000		ug/L	1000.0	08/05/2022	AB22-0812-22

Data Qualifiers	Exception Summary
K = RL increased due to matrix interference.	No other exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0770

Inspection Date: 7.27.22 **Inspection By:** dmw

Sample Origin/Project Name: Q3-2022 DEK Lined Impoundment

Shipment Delivered By: Enter the type of shipment carrier.

Pony ____ FedEx ✓ UPS ____ USPS ____ Airborne ____

Other/Hand Carry (whom) ____

Tracking Number: 276029587472 dmw 7.27.22 72 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 2.4-5.6°C Samples Received on Ice: Yes ✓ No ____

M&TE # and Expiration 015402 | 5.25.23

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	16				
Quart/Liter (g/p)	20				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	41				
24 mL vial (glass)					
~~500~~ 250 mL (plastic)	8				
Other					

pH paper
0.0-14.0
13-640-508
LOT: 222420
Exp. 8.1.23

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q3-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0770

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	Dissolved metals	REMARKS
22-0770-01	7-26-22	1346	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-02	7-26-22	1129	GW	OW-10	10	4	2	1	1	2			x	x	x	x	x	x	x	x	X	
-03	7-26-22	1233	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-04	7-26-22	1031	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-05	7-26-22	0949	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-06	7-26-22	0939	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-07	7-26-22	0905	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-08	7-26-22	—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-09	7-26-22	1400	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		
-10	7-26-22	1129	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		

ANALYSIS REQUESTED (Attach List if More Space is Needed)

RELINQUISHED BY: [signature] — DATE/TIME: 7-26-22 / 1530 — RECEIVED BY: Fed Ex

RELINQUISHED BY: Fed Ex — DATE/TIME: 07-27-22 11:00 — RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 2.4 - 5.6 °C — Cal. Due Date: 5-25-23

Analytical Laboratory Report

Report ID: S38578.01(01)
Generated on 07/28/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S38578.01-S38578.10
Project: 22-0770 PR#22070818
Collected Date(s): 07/26/2022
Submitted Date/Time: 07/28/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S38578.01	22-0770-01 (DEK-MW-15003)	Groundwater	07/26/22 13:46
S38578.02	22-0770-02 (OW-10)	Groundwater	07/26/22 11:29
S38578.03	22-0770-03 (OW-11)	Groundwater	07/26/22 12:33
S38578.04	22-0770-04 (OW-12)	Groundwater	07/26/22 10:31
S38578.05	22-0770-05 (KLI-SCS)	Groundwater	07/26/22 09:49
S38578.06	22-0770-06 (KLI-PCS)	Groundwater	07/26/22 09:39
S38578.07	22-0770-07 (SW-DITCH)	Groundwater	07/26/22 09:05
S38578.08	22-0770-08 (DUP-KLI)	Groundwater	07/26/22 00:01
S38578.09	22-0770-09 (EB-KLI)	Groundwater	07/26/22 14:00
S38578.10	22-0770-10 (FB-KLI)	Groundwater	07/26/22 11:29

Analytical Laboratory Report

Lab Sample ID: S38578.01
Sample Tag: 22-0770-01 (DEK-MW-15003)
Collected Date/Time: 07/26/2022 13:46
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:11, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.18	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.02
Sample Tag: 22-0770-02 (OW-10)
Collected Date/Time: 07/26/2022 11:29
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:13, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.11	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.03
Sample Tag: 22-0770-03 (OW-11)
Collected Date/Time: 07/26/2022 12:33
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:15, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.04
Sample Tag: 22-0770-04 (OW-12)
Collected Date/Time: 07/26/2022 10:31
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:19, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.05
Sample Tag: 22-0770-05 (KLI-SCS)
Collected Date/Time: 07/26/2022 09:49
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:21, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.06
Sample Tag: 22-0770-06 (KLI-PCS)
Collected Date/Time: 07/26/2022 09:39
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:23, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.07
Sample Tag: 22-0770-07 (SW-DITCH)
Collected Date/Time: 07/26/2022 09:05
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:25, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.08
Sample Tag: 22-0770-08 (DUP-KLI)
Collected Date/Time: 07/26/2022 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:27, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.09
Sample Tag: 22-0770-09 (EB-KLI)
Collected Date/Time: 07/26/2022 14:00
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:29, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38578.10
Sample Tag: 22-0770-10 (FB-KLI)
Collected Date/Time: 07/26/2022 11:29
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:31, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID: S38578
Client: CONSUMERS (Consumers Energy)
Project: 22-0770 PR#22070818
Submitted: 07/28/2022 08:15 Login User: PFD

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.9
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[ ] Yes	[X] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Prepared by Merit Laboratories

Merit Laboratories Bottle Preservation Check

Lab Set ID: S38578 Submitted: 07/28/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0770 PR#22070818

Initial Preservation Check: 07/28/2022 08:44 PFD

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S38578.01	125ml Plastic NaOH	>12			
S38578.02	125ml Plastic NaOH	>12			
S38578.03	125ml Plastic NaOH	>12			
S38578.04	125ml Plastic NaOH	>12			
S38578.05	125ml Plastic NaOH	>12			
S38578.06	125ml Plastic NaOH	>12			
S38578.07	125ml Plastic NaOH	>12			
S38578.08	125ml Plastic NaOH	>12			
S38578.09	125ml Plastic NaOH	>12			
S38578.10	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 22-0770 PR#22070818
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
385780.01	07/26/22	1346	22-0770-01 (DEK-MW-15003)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	07/26/22	1129	22-0770-02 (OW-10)	GW	1					1			✓	"
.03	07/26/22	1233	22-0770-03 (OW-11)	GW	1					1			✓	"
.04	07/26/22	1031	22-0770-04 (OW-12)	GW	1					1			✓	"
.05	07/26/22	0949	22-0770-05 (KLI-SCS)	GW	1					1			✓	"
.06	07/26/22	0939	22-0770-06 (KLI-PCS)	GW	1					1			✓	"
.07	07/26/22	0905	22-0770-07 (SW-DITCH)	GW	1					1			✓	"
.08	07/26/22	-	22-0770-08 (DUP-KLI)	GW	1					1			✓	"
.09	07/26/22	1400	22-0770-09 (EB-KLI)	GW	1					1			✓	"
.10	07/26/22	1129	22-0770-10 (FB-KLI)	GW	1					1			✓	"

RELINQUISHED BY: SIGNATURE/ORGANIZATION	CONSUMERS ENERGY (Sampler)	DATE 07.27.22	TIME 2015	RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE 7/28/22	TIME 0815
RECEIVED BY: SIGNATURE/ORGANIZATION	Merit Drop Box	DATE	TIME	RECEIVED BY: SIGNATURE/ORGANIZATION	Patrick Ne	DATE 7/28/22	TIME 0815
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL 5.9
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

August 05, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q3-2022 DEK Lined Impoundment
22-0770

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 08/01/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 83522 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05781**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-01 DEK-MW-15003**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**5100**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**3700**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05782**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-02 OW-10**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**9400**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**7900**	ug/L	1000	SM5310B	RG	08/05/2022

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Released by

Date 8/5/2022

Brighton Analytical LLC
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Brighton, Michigan 48114
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e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05783**
Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-03 OW-11**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**6700**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**6000**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 8/5/2022

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NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05784**
Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-04 OW-12**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**2600**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**2300**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

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EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05785**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-05 KLI-SCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4400**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**2900**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

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e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05786**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-06 KLI-PCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4100**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**2900**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

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EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05787**
Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-07 SW-DITCH**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**5700**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**5000**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

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Date 8/5/2022

Brighton Analytical LLC
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EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05788**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-08 DUP-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**2600**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**2200**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

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e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05789**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-09 EB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/05/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83522**
BA Sample ID: **CR05790**

Project Name: **Q3-2022 DEK Lined Impoundment**
Project Number: **22-0770**
Sample ID: **22-0770-10 FB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**1000**	ug/L	1000	SM5310B	RG	08/05/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	08/05/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/5/2022

CHAIN OF CUSTODY

B3522

Consumers Energy — Count on Us®

CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q3-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0770

SAP CC or WO#:

REQUESTER: Emil Blaj

SAMPLING TEAM:

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

SEND REPORT TO: Emil Blaj | email: Emil.Blaj@cmsenergy.com | phone:

COPY TO:

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 Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0770-01	07/26/2022	1346	GW	DEK-MW-15003	2					2			x	x	CP 5781
-02	07/26/2022	1129	GW	OW-10	2					2			x	x	82
-03	07/26/2022	1233	GW	OW-11	2					2			x	x	83
-04	07/26/2022	1031	GW	OW-12	2					2			x	x	84
-05	07/26/2022	0949	W	KLI-SCS	2					2			x	x	85
-06	07/26/2022	0939	SW	KLI-PCS	2					2			x	x	86
-07	07/26/2022	0905	SW	SW-DITCH	2					2			x	x	87
-08	07/26/2022	-	GW	DUP-KLI	2					2			x	x	88
-09	07/26/2022	1400	W	EB-KLI	2					2			x	x	89
-10	07/26/2022	1129	W	FB-KLI	2					2			x	x	90

22-0770 Page 58 of 61

RELINQUISHED BY: Casey Hanlen | DATE/TIME: 8/1/22 0950 | RECEIVED BY:

RELINQUISHED BY: | DATE/TIME: | RECEIVED BY:

COMMENTS: PR # 22070824

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

Temperature: 3.8 °C Cal. Due Date: _____

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 8/5/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CR05785	TV=10000	2900	97/98	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CR05785	12600	12600	0.00	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	103		
Method Standard (Lab. Control Spike):		#3046.6	104		

COMMENTS: _____

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 8/5/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CR05785	TV=10000	4400	95/95	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CR05785	13800	13900	0.72	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	103		
Method Standard (Lab. Control Spike):		#3046.6	104		

COMMENTS:

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: August 12, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2022 Q3

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-0769

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area on 07/26/2022, for the 3rd Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 07/26/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

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

II. Methodology

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

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q3-2022 DEK Bottom Ash Pond & Lined Impoundment
Date Received: 7/27/2022
Chemistry Project: 22-0769

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-0769-01	DEK-MW-18001	Groundwater	07/26/2022 12:35 PM	DEK Bottom Ash Pond & Lined Impoundment
22-0769-02	DEK-MW-18001 MS	Groundwater	07/26/2022 12:35 PM	DEK Bottom Ash Pond & Lined Impoundment
22-0769-03	DEK-MW-18001 MSD	Groundwater	07/26/2022 12:35 PM	DEK Bottom Ash Pond & Lined Impoundment

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-0769-01
Matrix: Groundwater

Laboratory Project: **22-0769**
Collect Date: 07/26/2022
Collect Time: 12:35 PM

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

Aliquot #: 22-0769-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Arsenic	89		ug/L	1.0	08/01/2022	AB22-0801-11
Barium	137		ug/L	5.0	08/01/2022	AB22-0801-11
Beryllium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Boron	945		ug/L	20.0	08/02/2022	AB22-0801-11
Cadmium	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Calcium	62400		ug/L	1000.0	08/02/2022	AB22-0801-11
Chromium	1		ug/L	1.0	08/01/2022	AB22-0801-11
Cobalt	ND		ug/L	6.0	08/01/2022	AB22-0801-11
Copper	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Iron	1090		ug/L	20.0	08/02/2022	AB22-0801-11
Lead	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Lithium	22		ug/L	10.0	08/01/2022	AB22-0801-11
Magnesium	12400		ug/L	1000.0	08/02/2022	AB22-0801-11
Manganese	209		ug/L	5.0	08/01/2022	AB22-0801-11
Molybdenum	ND		ug/L	5.0	08/01/2022	AB22-0801-11
Nickel	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Potassium	3550		ug/L	100.0	08/02/2022	AB22-0801-11
Selenium	ND		ug/L	1.0	08/01/2022	AB22-0801-11
Silver	ND		ug/L	0.2	08/01/2022	AB22-0801-11
Sodium	92300		ug/L	1000.0	08/02/2022	AB22-0801-11
Thallium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Vanadium	ND		ug/L	2.0	08/01/2022	AB22-0801-11
Zinc	ND		ug/L	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0769-01-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0769-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	07/27/2022	AB22-0727-08
Nitrite	ND		ug/L	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0769-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	62700		ug/L	1000.0	08/04/2022	AB22-0803-07

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Analytical Report

Report Date: 08/12/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-0769-01
Matrix: Groundwater

Laboratory Project: **22-0769**
Collect Date: 07/26/2022
Collect Time: 12:35 PM

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

Aliquot #: 22-0769-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	07/27/2022	AB22-0803-07
Sulfate	127000		ug/L	1000.0	08/04/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0769-01-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2820		ug/L	25.0	08/09/2022	AB22-0809-04

Total Dissolved Solids by SM 2540C

Aliquot #: 22-0769-01-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	532		mg/L	10.0	07/28/2022	AB22-0728-04

Alkalinity by SM 2320B

Aliquot #: 22-0769-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	206000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Bicarbonate	206000		ug/L	10000.0	08/05/2022	AB22-0805-01
Alkalinity Carbonate	ND		ug/L	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0769-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	77		ug/L	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0769-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4900		ug/L	1000.0	08/02/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0769-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6400		ug/L	1000.0	08/02/2022	AB22-0812-22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-0769-02
Matrix: Groundwater

Laboratory Project: **22-0769**
Collect Date: 07/26/2022
Collect Time: 12:35 PM

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

Aliquot #: 22-0769-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	107		%	1.0	08/01/2022	AB22-0801-11
Arsenic	100		%	1.0	08/01/2022	AB22-0801-11
Barium	106		%	5.0	08/01/2022	AB22-0801-11
Beryllium	105		%	1.0	08/01/2022	AB22-0801-11
Boron	109		%	20.0	08/02/2022	AB22-0801-11
Cadmium	107		%	0.2	08/01/2022	AB22-0801-11
Calcium	105		%	1000.0	08/02/2022	AB22-0801-11
Chromium	92		%	1.0	08/01/2022	AB22-0801-11
Cobalt	95		%	6.0	08/01/2022	AB22-0801-11
Copper	93		%	1.0	08/01/2022	AB22-0801-11
Iron	115		%	20.0	08/02/2022	AB22-0801-11
Lead	97		%	1.0	08/01/2022	AB22-0801-11
Lithium	98		%	10.0	08/01/2022	AB22-0801-11
Magnesium	108		%	1000.0	08/02/2022	AB22-0801-11
Manganese	97		%	5.0	08/01/2022	AB22-0801-11
Molybdenum	106		%	5.0	08/01/2022	AB22-0801-11
Nickel	92		%	2.0	08/01/2022	AB22-0801-11
Potassium	113		%	100.0	08/02/2022	AB22-0801-11
Selenium	101		%	1.0	08/01/2022	AB22-0801-11
Silver	97.8		%	0.2	08/01/2022	AB22-0801-11
Sodium	110		%	1000.0	08/02/2022	AB22-0801-11
Thallium	96		%	2.0	08/01/2022	AB22-0801-11
Vanadium	97		%	2.0	08/01/2022	AB22-0801-11
Zinc	94		%	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0769-02-C01-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	92.0		%	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0769-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	90		%	100.0	07/27/2022	AB22-0727-08
Nitrite	88		%	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0769-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	103		%	1000.0	08/04/2022	AB22-0803-07

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-0769-02
Matrix: Groundwater

Laboratory Project: **22-0769**
Collect Date: 07/26/2022
Collect Time: 12:35 PM

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

Aliquot #: 22-0769-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	93		%	1000.0	07/27/2022	AB22-0803-07
Sulfate	99		%	1000.0	08/04/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0769-02-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	91		%	25.0	08/09/2022	AB22-0809-04

Alkalinity by SM 2320B

Aliquot #: 22-0769-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	95.8		%	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0769-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0769-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	92		%	1000.0	08/02/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0769-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	98		%	1000.0	08/02/2022	AB22-0812-22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-0769-03
Matrix: Groundwater

Laboratory Project: **22-0769**
Collect Date: 07/26/2022
Collect Time: 12:35 PM

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

Aliquot #: 22-0769-03-C01-A01 Analyst: EB

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	105		%	1.0	08/01/2022	AB22-0801-11
Arsenic	100		%	1.0	08/01/2022	AB22-0801-11
Barium	98		%	5.0	08/01/2022	AB22-0801-11
Beryllium	105		%	1.0	08/01/2022	AB22-0801-11
Boron	117		%	20.0	08/02/2022	AB22-0801-11
Cadmium	102		%	0.2	08/01/2022	AB22-0801-11
Calcium	107		%	1000.0	08/02/2022	AB22-0801-11
Chromium	96		%	1.0	08/01/2022	AB22-0801-11
Cobalt	97		%	6.0	08/01/2022	AB22-0801-11
Copper	93		%	1.0	08/01/2022	AB22-0801-11
Iron	114		%	20.0	08/02/2022	AB22-0801-11
Lead	100		%	1.0	08/01/2022	AB22-0801-11
Lithium	95		%	10.0	08/01/2022	AB22-0801-11
Magnesium	110		%	1000.0	08/02/2022	AB22-0801-11
Manganese	97		%	5.0	08/01/2022	AB22-0801-11
Molybdenum	108		%	5.0	08/01/2022	AB22-0801-11
Nickel	93		%	2.0	08/01/2022	AB22-0801-11
Potassium	112		%	100.0	08/02/2022	AB22-0801-11
Selenium	102		%	1.0	08/01/2022	AB22-0801-11
Silver	97.9		%	0.2	08/01/2022	AB22-0801-11
Sodium	111		%	1000.0	08/02/2022	AB22-0801-11
Thallium	100		%	2.0	08/01/2022	AB22-0801-11
Vanadium	99		%	2.0	08/01/2022	AB22-0801-11
Zinc	95		%	10.0	08/01/2022	AB22-0801-11

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-0769-03-C01-A02 Analyst: DMW

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	98.0		%	0.2	08/03/2022	AB22-0803-14

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-0769-03-C02-A01 Analyst: DMW

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	83		%	100.0	07/27/2022	AB22-0727-08
Nitrite	87		%	100.0	07/27/2022	AB22-0727-08

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

Aliquot #: 22-0769-03-C02-A02 Analyst: DMW

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	97		%	1000.0	08/04/2022	AB22-0803-07

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-0769-03
Matrix: Groundwater

Laboratory Project: **22-0769**
Collect Date: 07/26/2022
Collect Time: 12:35 PM

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

Aliquot #: 22-0769-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	91		%	1000.0	07/27/2022	AB22-0803-07
Sulfate	88		%	1000.0	08/04/2022	AB22-0803-07

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-0769-03-C03-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	93		%	25.0	08/09/2022	AB22-0809-04

Alkalinity by SM 2320B

Aliquot #: 22-0769-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	96.3		%	10000.0	08/05/2022	AB22-0805-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-0769-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	20.0	07/28/2022	AB22-0803-11

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0769-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	94		%	1000.0	08/02/2022	AB22-0812-21

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-0769-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	91		%	1000.0	08/02/2022	AB22-0812-22

Data Qualifiers	Exception Summary
	No exceptions occured.

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-0769

Inspection Date: 7.27.22 **Inspection By:** dmw

Sample Origin/Project Name: Q3-2022 DEK Bottom Ash Pond & Lined Impound

Shipment Delivered By: Enter the type of shipment carrier.

Pony ____ FedEx ✓ UPS ____ USPS ____ Airborne ____

Other/Hand Carry (whom) ____

Tracking Number: 5 of 5 with 2760 2958 7472 Shipping Form Attached: Yes ____ No ____

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

Cooler ✓ Cardboard Box ____ Custom Case ____ Envelope/Mailer ____

Loose/Unpackaged Containers ____ Other ____

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

Damaged Shipment Observed: None ✓ Dented ____ Leaking ____

Other ____

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

Shipping Containers Received: Opened ____ Sealed ✓

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

CoC ✓ Work Request ____ Air Data Sheet ____ Other ____

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

As-Received Temperature Range 0.6°C Samples Received on Ice: Yes ✓ No ____

M&TE # and Expiration 015402 | 5.25.23

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	6				
Quart/Liter (g/p)	6				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	12				
24 mL vial (glass)					
500 mL (plastic)	1				
Other					

pH paper
0.0 – 14.0
13-640-508
lot: 222420
Exp: 8.1.23
250

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

Page 1 of 1

SAMPLING SITE / CUSTOMER: Q3-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-0769

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: Henry Schmidt

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	
22-0769-01	7/26/22	1235	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	↓	1235	GW	DEK-MW-18001 MS	8	3	1	1	1	2			x	x	x		x	x	x	x	
-03	↓	1235	GW	DEK-MW-18001 MSD	8	3	1	1	1	2			x	x	x		x	x	x	x	

ANALYSIS REQUESTED (Attach List if More Space is Needed)

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

REMARKS

RELINQUISHED BY: Henry W Schmidt — DATE/TIME: 7/26/22 1600 — RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex — DATE/TIME: 07-27-22 11:00 — RECEIVED BY:

COMMENTS:

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

Temperature: 0.6 °C — Cal. Due Date: 5-25-23

Analytical Laboratory Report

Report ID: S38577.01(01)
Generated on 07/28/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S38577.01-S38577.03
Project: 22-0769 PR#22070818
Collected Date(s): 07/26/2022
Submitted Date/Time: 07/28/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S38577.01	22-0769-01 (DEK-MW-18001)	Groundwater	07/26/22 12:35
S38577.02	22-0769-01 (DEK-MW-18001 Field MS)	Groundwater	07/26/22 12:35
S38577.03	22-0769-01 (DEK-MW-18001 Field MSD)	Groundwater	07/26/22 12:35

Analytical Laboratory Report

Lab Sample ID: S38577.01
Sample Tag: 22-0769-01 (DEK-MW-18001)
Collected Date/Time: 07/26/2022 12:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:03, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.077	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38577.02
Sample Tag: 22-0769-01 (DEK-MW-18001 Field MS)
Collected Date/Time: 07/26/2022 12:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:07, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.262	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S38577.03
Sample Tag: 22-0769-01 (DEK-MW-18001 Field MSD)
Collected Date/Time: 07/26/2022 12:35
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	5.9	IR

Inorganics

Method: SM4500-S2 D, Run Date: 07/28/22 11:09, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.260	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID: S38577
Client: CONSUMERS (Consumers Energy)
Project: 22-0769 PR#22070818
Submitted: 07/28/2022 08:15 Login User: PFD

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.9
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[ ] Yes	[X] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S38577 Submitted: 07/28/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0769 PR#22070818

Initial Preservation Check: 07/28/2022 08:37 PFD

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S38577.01	125ml Plastic NaOH	>12			
S38577.02	125ml Plastic NaOH	>12			
S38577.03	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 22-0769 PR#22070818
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
38577.01	07/26/22	1235	22-0769-01 (DEK-MW-18001)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	07/26/22	1235	22-0769-02 (DEK-MW-18001 Field MS)	GW	1					1			✓	"
.03	07/26/22	1235	22-0769-03 (DEK-MW-18001 Field MSD)	GW	1					1			✓	"
														Please spike MS/MSD and report
														spike concentration and/or rec.

RELINQUISHED BY: SIGNATURE/ORGANIZATION: CONSUMERS ENERGY ☐ Sampler | DATE: 07-27-22 | TIME: 2015
RECEIVED BY: SIGNATURE/ORGANIZATION: Merit Drop Box | DATE | TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION | DATE | TIME
RECEIVED BY: SIGNATURE/ORGANIZATION | DATE | TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box | DATE: 7/28/22 | TIME: 0815
RECEIVED BY: SIGNATURE/ORGANIZATION: Patrick | DATE: 7/28/22 | TIME: 0815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: | TEMP. ON ARRIVAL: 5.9

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

August 03, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q3-2022 DEK Bottom Ash Pond & Lined Impound
22-0769

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 08/01/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 83519 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/03/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83519**
BA Sample ID: **CR05764**
Project Name: **Q3-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-0769**
Sample ID: **22-0769-01 DEK-MW-18001**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**6400**	ug/L	1000	SM5310B	RG	08/02/2022
Total Organic Carbon	**4900**	ug/L	1000	SM5310B	RG	08/02/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/3/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/03/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83519**
BA Sample ID: **CR05765**

Project Name: **Q3-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-0769**
Sample ID: **22-0769-02 DEK-MW-18001 MS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**98%**	ug/L	1000	SM5310B	RG	08/02/2022
Total Organic Carbon	**92%**	ug/L	1000	SM5310B	RG	08/02/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/3/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 07/26/2022
Submit Date: 08/01/2022
Report Date: 08/03/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **83519**
BA Sample ID: **CR05766**

Project Name: **Q3-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-0769**
Sample ID: **22-0769-02 DEK-MW-18001 MSD**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**94%**	ug/L	1000	SM5310B	RG	08/02/2022
Total Organic Carbon	**91%**	ug/L	1000	SM5310B	RG	08/02/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 8/3/2022

CHAIN OF CUSTODY

83519

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q3-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-0769

SAP CC or WO#:

REQUESTER: Emil Blaj

SAMPLING TEAM:

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

SEND REPORT TO: Emil Blaj — email:Emil.Blaj@cmsenergy.com — phone:

COPY TO:

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 Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0769-01	07/26/2022	1235	GW	DEK-MW-18001	2					2			x	x	CR2 5764
-02	07/26/2022	1235	GW	DEK-MW-18001 MS	2					2			x	x	65
-03	07/26/2022	1235	GW	DEK-MW-18001 MSD	2					2			x	x	66

22-0769 Page 29 of 32

RELINQUISHED BY: Casey Hansen — DATE/TIME: 8/1/22 0950 — RECEIVED BY:

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

COMMENTS: PR # 22070824

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

Temperature: 3.6 °C — Cal. Due Date: _____

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 8/2/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CR05764	TV=10000	4900	92/91	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CR05764	14100	14000	0.71	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	101		
Method Standard (Lab. Control Spike):		#3046.6	98		

COMMENTS:

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 8/2/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CR05764	TV=10000	6400	98/94	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CR05764	16100	15700	2.50	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	101		
Method Standard (Lab. Control Spike):		#3046.6	98		

COMMENTS:

Appendix B
Field Notes

TRC

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance
PROJECT NUMBER:	464095.0001.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	TO
PURPOSE OF FIELDWORK:	Third Quarter Supplemental Sampling Event
WORK PERFORMED BY:	Jake Krenz, Javier Jasso, Henry Schnaidt

HS 7/28/22
SIGNED DATE

CHECKED BY 8-5-22
DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Comp	DATE: 7-26-22	TIME ARRIVED: 0800
PROJECT NUMBER: 464095.0001.0000	AUTHOR: (Jake Krenz), Javier Jasso,	TIME LEFT: 1500

WEATHER

TEMPERATURE: 75 °F WIND: 0-5 MPH VISIBILITY: ~~Rose~~ Sunny

WORK / SAMPLING PERFORMED

Collected Karn BAP/LI Samples

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
purge water	NM	purged to ground

Jake Krenz 8-5-22
SIGNED DATE

CHECKED BY DATE 8/18/22

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Comp	DATE: 7-27-22	TIME ARRIVED: 0900
PROJECT NUMBER:	464095.0001.0000	AUTHOR: ~~Andrew Whaley, Jake Krer~~ B. Jones	TIME LEFT: 1600

WEATHER		
TEMPERATURE: 61 °F	WIND: 10 MPH	VISIBILITY: Overcast

WORK / SAMPLING PERFORMED

DEK-MW-4S004, DUP-1 (22004, 20001, 22002, 22003, 22006, 22005)

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS

SIGNED 8/1/22 DATE

CHECKED BY 8-5-22 DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW	SAMPLER NAME:	Andrew Whaley, Jake Krenz, Javier Jass
PROJECT NO.:	464095.0001.0000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NA	NA
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PURGING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)

SAMPLING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
GEOTECH DISPOSABLE FILTER	0.45 MICRON
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

STORE BOUGHT	LABORATORY PROVIDED
POTABLE WATER SOURCE	DI WATER SOURCE
[signature] 8/5/22	[signature] 8-5-22
SIGNED DATE	CHECKED BY DATE

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	MODEL: YSI Pro DSS	SAMPLER: AW, (JK) JJ
PROJECT NO.:	464095.0001.0000	SERIAL #: Ann Arbor	DATE: 7/26/22

PH CALIBRATION CHECK

pH 7 (LOT #): 26B1074 (EXP. DATE): Feb/24 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 26C933 (EXP. DATE): Mar/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.02 / 7.02	4.00 / 4.00	☒ WITHIN RANGE	0753
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 06D943 (EXP. DATE): APR/23 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1309 / 1309	20.7	☒ WITHIN RANGE	0749
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21F100563 (EXP. DATE): 6-22-26 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
216.4 / 216.4	20.5	☒ WITHIN RANGE	0758
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
10.53 / 10.53	20.5	☒ WITHIN RANGE	0800
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A7102 (EXP. DATE): 4/23 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
10.0 / 10.0	/	☒ WITHIN RANGE	0800
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED 8-5-22 DATE

CHECKED BY 8/18/22 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn LF: 2022 GW Compliance	MODEL:	Pro DSS	SAMPLER:	AW, JJ, JK
PROJECT NO.:	464095.0000.0000	SERIAL #:	A2	DATE:	7/27/22

PH CALIBRATION CHECK

pH 7 (LOT #): 26B1074 (EXP. DATE): 2/24 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 26B1055 (EXP. DATE): 2/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
700 / 700	/	☑ WITHIN RANGE	0556
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 15H0687 (EXP. DATE): 8/22 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1360 / 1330	22.0	☑ WITHIN RANGE	0510
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21B1006687 (EXP. DATE): 2/24 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
220 / 220	24.0	☑ WITHIN RANGE	0516
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
8.19 / 8.19	24C	☑ WITHIN RANGE	0179
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A2172 (EXP. DATE): 6/24 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0 / 0	/	☑ WITHIN RANGE	0516
10 / 10	/	☑ WITHIN RANGE	0516
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED 8/3/22 DATE

CHECKED BY 8-5-22 DATE

TRC

WATER LEVEL DATA

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Compliance	DATE: 7/25/22
PROJECT NUMBER: 464095.0001.0000	AUTHOR: Jake Krenz, Javier Jasso, Her

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
DE Karn Bottom Ash Pond						
DEK-MW-15002	1000		6.93	17.71		
DEK-MW-15004	1021		28.28	41.80		
DEK-MW-15005	0935		9.24	22.23		
DEK-MW-15006	0939		8.73	21.56		
DE Karn Bottom Ash Pond and Lined Impoundment						
DEK-MW-18001	1007		8.15	19.65		
DEK-MW-15003	1016		16.76	27.87		
Karn Lined Impoundment						
OW-10	1400		6.41	1791		
OW-11	1012		22.08	25.67		
OW-12	1004		17.21	2341		
Background						
MW-15002	0900		6.88	16.80		
MW-15008	0833		4.91	1746		
MW-15016	0905		3.60	610		
MW-15019	0851		5.44	16.67		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 7/25/22 DATE

CHECKED 8-5-22 DATE

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 7-26-22	BY: AW	DATE: 8/18/22

SAMPLE ID: SW-Ditch | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: ~~—~~	DATE: ~~—~~

PURGE METHOD: ~~PUMP~~ ~~PERISTALTIC PUMP~~ ~~BAILER~~ Dip cup

DEPTH TO WATER: NA T/ PVC

DEPTH TO BOTTOM: NA T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: NA ☐ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY
☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0905	DATE: 7-26-22

PH: 8.13 SU CONDUCTIVITY: 717 umhos/cm

ORP: 127.5 mV DO: 7.4 mg/L

TURBIDITY: 18.4 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 28.5 °C OTHER:

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0905	NA	8.13	717	127.5	7.4	18.4	28.5	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1			C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1	↓		D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7-26-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	8-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK JJ	DATE: 7-26-22	BY: AW	DATE: 8/5/22

SAMPLE ID: KLI - PCS | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~☑ PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER N/A

SAMPLE TYPE: ~~☑ GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: ____ T/ PVC

DEPTH TO BOTTOM: ____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: ____ ☐ LITERS ☐ GALLONS

COLOR: ____ ODOR: ____

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0939	DATE: 7-26-22

PH: 8.56 SU CONDUCTIVITY: 578 umhos/cm

ORP: 84.0 mV DO: 8.3 mg/L

TURBIDITY: 5.62 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 25.4 °C OTHER: ____

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP- ____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0939	NM	8.56	578	84.0	8.3	5.62	25.4	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓	↓	C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1	↓	↓	D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7-26-22	AIRBILL NUMBER:	____
COC NUMBER:	____	SIGNATURE:	[signature]	DATE SIGNED:	8-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 7-26-22	BY: AW	DATE: 8/18/22

SAMPLE ID: KLI - SCS | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~☑ PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☑ OTHER NA

SAMPLE TYPE: ~~☑ GW~~ ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☒ OTHER Secondary Collection

PURGING	TIME:	DATE:

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: _____ T/ PVC

DEPTH TO BOTTOM: _____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: _____ ☐ LITERS ☐ GALLONS

COLOR: _____ ODOR: _____

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0949	DATE: 7-26-22

PH: 7.27 SU CONDUCTIVITY: 1793 umhos/cm

ORP: 64.4 mV DO: 3.0 mg/L

TURBIDITY: 8.61 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 21.2 °C OTHER: ~~

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0949	NA	7.27	1793	64.4	3.0	8.61	21.2	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓	↓	C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1	↓	↓	D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7-26-22	AIRBILL NUMBER:	~~
COC NUMBER:	~~	SIGNATURE:		DATE SIGNED:	8-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (CK) JJ	DATE: 7-26-22	BY: AW	DATE: 8/18/22

SAMPLE ID: OW-10 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1057	DATE: 7-26-22	SAMPLE	TIME: 1129	DATE: 7/26/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 6.42 T/ PVC

DEPTH TO BOTTOM: ____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 7.16 SU CONDUCTIVITY: 679 umhos/cm

ORP: -129.1 mV DO: 0.5 mg/L

TURBIDITY: 24.2 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.0 °C OTHER: ____

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP- ____

COMMENTS: FB-KLT collected

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1059	100	7.22	678	-81.3	2.1	6.13	14.2	7.00	INITIAL
1104	100	7.14	667	-92.9	1.1	12.7	14.1	7.29	.5
1109	100	7.13	664	-107.1	0.7	19.1	13.2	7.72	1.0
1114	100	7.13	671	-114.0	0.6	30.8	13.2	8.00	1.5
1119	100	7.14	676	-122.2	0.6	24.9	13.2	8.14	2.0
1124	100	7.15	673	-125.3	0.6	26.5	13.1	8.23	2.5
1129	100	7.16	679	-129.1	0.5	24.2	13.0	8.34	3.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	Plastic	A	☐ Y ☒ N	2	40mL	VOA	E	☐ Y ☒ N
2	↓	↓	B	☐ Y ☒ N	2	40mL	↓	E	☒ Y ☐ N
2	↓	↓	C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
2	↓	↓	D	☐ Y ☒ N	1	125mL	Plastic	B	☒ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Fedex DATE SHIPPED: 7-26-22 AIRBILL NUMBER: ~

COC NUMBER: ~ SIGNATURE: [signature] DATE SIGNED: 8-5-22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 7-26-22	BY: AW	DATE: 8/18/22

SAMPLE ID: OW-11 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1208	DATE: 7-26-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 21.91 T/ PVC

DEPTH TO BOTTOM: _____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 1.5 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1233	DATE: 7-26-22

PH: 9.76 SU CONDUCTIVITY: 326.4 umhos/cm

ORP: -58.7 mV DO: 1.1 mg/L

TURBIDITY: 3.2 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.6 °C OTHER: —

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1218	100	9.77	323.4	-40.2	2.2	15.3	14.2	23.00	INITIAL
1223	100	9.79	326.0	-49.1	1.2	8.12	13.6	23.28	.5
1228	100	9.76	326.9	-54.2	1.0	4.65	13.6	23.52	1.0
1233	100	~~9.69~~ 9.76	326.4	-58.7	1.1	3.20	13.6	23.56	1.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1			C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1			D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7-26-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	8-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 7-26-22	BY: A. Whaley	DATE: 8/18/22

SAMPLE ID: OW-12 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1009	DATE: 7-26-22	SAMPLE	TIME: 1031	DATE: 7-26-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 17.17 T/ PVC

DEPTH TO BOTTOM: _____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: _____ ☐ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY: ☐ NONE ☐ SLIGHT ☒ MODERATE ☐ VERY

DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER

PH: 7.09 SU CONDUCTIVITY: 743 umhos/cm

ORP: -116.7 mV DO: 0.6 mg/L

TURBIDITY: 1.80 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.5 °C OTHER: _____

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☒ DUP- KLI

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1011	200	7.11	772	-91.1	1.4	41.8	15.9	~~17.25~~ 17.23	INITIAL
1016	200	7.08	747	-102.4	0.9	13.5	15.7	17.23	1
1021	200	7.08	747	-108.3	0.7	5.34	15.6	17.23	2
1026	200	7.09	745	-113.6	0.6	3.14	15.6	17.23	3
1031	200	7.09	743	-116.7	0.6	1.80	15.5	17.23	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	Plastic	A	☐ Y ☒ N	2	40mL	VOA	E	☐ Y ☒ N
2	↓	↓	B	☐ Y ☒ N	2	40mL	↓	E	☒ Y ☐ N
2	↓	↓	C	☐ Y ☒ N	4	60mL	↓	A	☐ Y ☒ N
2	↓	↓	D	☐ Y ☒ N					☐ Y ☐ N
2	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7-26-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	8-5-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 7/26/22	BY: SK	DATE: 8-5-22

SAMPLE ID: OEK-NW-15002 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1111	DATE: 7/26/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 6.98 T/ PVC

DEPTH TO BOTTOM: 15.75 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS

COLOR: clear w/ black + orange flakes ODOR: moderate

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1141	DATE: 7/26/22

PH: 7.22 SU CONDUCTIVITY: 913 umhos/cm

ORP: -139.9 mV DO: 0.01 mg/L

TURBIDITY: 8.01 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.3 °C OTHER:

COLOR: Clear ODOR: Slight

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: no odor

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1111	200	7.25	1020	-110.2	0.03	6.02	15.4	6.98	INITIAL
1116	200	7.23	1021	-127.2	0.23	7.71	14.5	7.19	1
1121	200	7.22	982	-133.9	0.09	5.79	14.3	7.18	2
1126	200	7.22	954	-134.6	0.04	9.82	14.1	7.19	3
1131	200	7.23	933	-136.3	0.01	5.37	14.1	7.19	4
1136	200	7.23	918	-137.8	0.01	4.78	14.1	7.19	5
1141	200	7.22	913	-139.9	0.01	8.01	14.3	7.19	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N	2	60	VOA	A	☐ Y ☒ N
1	125	↓	A	☐ Y ☒ N	1	40	VOA	E	☐ Y ☒ N
1	125		A	☐ Y ☒ N	1	40	VOA	E	☒ Y ☐ N
1	125		C	☐ Y ☒ N					☐ Y ☐ N
1	125	↓	D, Trizma	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7/26/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	7/26/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (K) JJ	DATE: 7-26-22	BY: AW	DATE: 8/18/22

SAMPLE ID: DEK - MW- 15003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1304	DATE: 7-26-22	SAMPLE	TIME: 1346	DATE: 7-26-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 16.69 T/ PVC

DEPTH TO BOTTOM: ____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 8 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

PH: 8.05 SU CONDUCTIVITY: 384.9 umhos/cm

ORP: -153.9 mV DO: 0.7 mg/L

TURBIDITY: 0.86 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 19.0 °C OTHER: —

COLOR: Clear ODOR: none

FILTRATE (0.45 um) ☑ YES ☐ NO

FILTRATE COLOR: — FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☐ DUP- ____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1306	200	8.36	379.4	3.9	2.1	5.47	19.3	17.85	INITIAL
1311	200	8.27	377.7	-10.5	1.0	2.07	19.4	18.80	1
1316	200	8.26	373.1	-57.1	0.8	1.99	19.7	19.36	2
1321	200	8.19	372.1	-101.1	0.8	1.45	18.8	19.52	3
1326	200	8.14	375.6	-123.1	0.7	1.02	18.8	19.60	4
1331	200	8.11	381.4	-136.9	0.7	1.00	18.8	19.63	5
1336	200	8.09	381.3	-146.4	0.7	0.91	19.0	19.75	6
1341	200	8.06	384.6	-151.5	0.7	1.03	19.0	19.75	7
1346	200	8.05	384.9	-153.9	0.7	0.86	19.0	19.75	8

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1			C	☐ Y ☒ N	2	60mL		A	☐ Y ☒ N
1			D	☐ Y ☒ N					☐ Y ☐ N
1	250mL		A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Fedex DATE SHIPPED: 7-26-22 AIRBILL NUMBER: —

COC NUMBER: — SIGNATURE: [signature] DATE SIGNED: 8-5-22

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK, JJ~~ MS	DATE: 7/26/22	BY: SK	DATE: 8-5-22

SAMPLE ID: OEK MW-1500S | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 842	DATE: 7/26/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.19 T/ PVC

DEPTH TO BOTTOM: 22.33 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY ☐ NONE ☑ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 857	DATE: 7/26/22

PH: 7.25 SU CONDUCTIVITY: 1076 umhos/cm

ORP: 148.4 mV DO: 0.51 mg/L

TURBIDITY: 3.57 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.0 °C OTHER: —

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☒ DUP- OEK-BAP-01

COMMENTS: took FB and EB too

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
842	200	7.28	1132	-135.8	1.58	3.89	12.8	9.19	INITIAL
847	200	7.25	1075	-150.4	0.71	4.08	130	9.31	1
852	200	7.25	1070	-150.5	0.59	4.29	12.9	9.31	2
857	200	7.25	1076	-148.4	0.51	3.57	13.0	9.31	3

0.70
-0.30
= 0.40

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250	plastic	A	☐ Y ☒ N	4	60	VOA	A	☐ Y ☒ N
2	125	plastic	A	☐ Y ☒ N	3	40	VOA	E	☐ Y ☒ N
2	125	plastic	B	☐ Y ☒ N	2	40	VOA	E	☒ Y ☐ N
2	125	plastic	C	☐ Y ☒ N					☐ Y ☐ N
2	125	plastic	D, ZnAc	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	7/26/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	MS	DATE SIGNED:	7/26/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED	CHECKED
PROJECT NUMBER:	464095.0001.0000	BY: ~~GW, JK, JJ~~ DATE: 7/26/22	BY: JK DATE: 8-5-22

SAMPLE ID: DEK-MW-B006 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1018	DATE: 7/26/22	SAMPLE	TIME: 1038	DATE: 7/26/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 8.66 T/ PVC

DEPTH TO BOTTOM: 21.52 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4 ☒ LITERS ☐ GALLONS

COLOR: Cleanish orange ODOR: none

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.70 SU CONDUCTIVITY: 818 umhos/cm

ORP: -172.1 mV DO: 0.47 mg/L

TURBIDITY: 3-15 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.4 °C OTHER:

COLOR: Clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1018	200	7.85	984	-172.5	1.92	11.41	14.9	8.66	INITIAL
1023	200	7.80	867	-179.7	0.92	4.80	14.5	8.80	1
1028	200	7.75	819	-178.2	0.68	3.68	14.3	8.79	2
1033	200	7.72	817	-174.0	0.56	3.43	14.4	8.79	3
1038	200	7.70	818	-172.1	0.47	3.15	14.4	8.79	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N	2	60	VOA	A	☐ Y ☒ N
1	125	plastic	A	☐ Y ☒ N	1	40	VOA	E	☐ Y ☒ N
1	125	plastic	A	☐ Y ☒ N	1	40	VOA	E	☒ Y ☐ N
1	125	plastic	C	☐ Y ☒ N					☐ Y ☐ N
1	125	plastic	D, ZnAc	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	7/26/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	JS	DATE SIGNED:	7/26/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: ~~AW, JK,~~ JJ	DATE: 7/26/22	BY: JR	DATE: 8-5-22

SAMPLE ID: UEk-MW-18001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1215	DATE: 7/26/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 8.19 T/ PVC

DEPTH TO BOTTOM: 19.69 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4 ☒ LITERS ☐ GALLONS

COLOR: grey/brown ODOR: mild

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1235	DATE: 7/26/22

PH: 7.39 SU CONDUCTIVITY: 694 umhos/cm

ORP: -143.3 mV DO: 0.16 mg/L

TURBIDITY: 2.01 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.0 °C OTHER:

COLOR: clear ODOR: mild

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: mild

QC SAMPLE: ☒ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1215	200	7.48	761	-155.0	2.20	8.11	14.6	8.19	INITIAL
1220	200	7.44	715	-141.8	0.55	4.06	14.1	8.39	1
1225	200	7.42	701	-142.2	0.30	4.72	14.0	8.39	2
1230	200	7.40	698	-142.8	0.21	2.82	14.0	8.39	3
1235	200	7.39	694	-143.3	0.16	2.01	14.0	8.39	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250	plastic	A	☐ Y ☒ N	6	60	VOA	A	☐ Y ☒ N
3	125	↓	A	☐ Y ☒ N	3	40	VOA	E	☐ Y ☒ N
3	125		B	☐ Y ☒ N	3	40	VOA	E	☒ Y ☐ N
3	125		C	☐ Y ☒ N					☐ Y ☐ N
3	125	↓	0, 2mA	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	7/26/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	JS	DATE SIGNED:	7/26/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 7/27/22	BY: JK	DATE: 8-5-22

SAMPLE ID: DFK MW 15004 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0653	DATE: 7/27/22	SAMPLE	TIME: 0647	DATE: 7/27/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 2832 T/ PVC

DEPTH TO BOTTOM: 4180 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 5 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY ☐ NONE ☑ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER

PH: 7.10 SU CONDUCTIVITY: 1017 umhos/cm

ORP: -111.0 mV DO: 1.00 mg/L

TURBIDITY: 2.46 NTU

☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.9 °C OTHER:

COLOR: Clear ODOR: none

FILTRATE (0.45 um) ☑ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☑ DUP- #2

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0633	200	6.00	609	86.5	6.3	20.0	17.3	28.18	INITIAL
0637		6.65	1037	-39.5	1.32	3.8	15.1	2836	1
0637		6.92	1028	-90.8	1.24	2.60	14.9	2836	2
0637		7.09	1032	-110.1	1.00	2.42	14.9	2841	3
0642		7.10	1019	-111.0	1.00	2.46	15.0	2841	4
0647		7.10	1017	-111.0	1.00	2.46	14.9	2841	5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	125	pl/ng	D	☐ Y ☑ N	2	125	pl	C	☐ Y ☑ N
2	40	VOC	E	☐ Y ☑ N	2	125	pl	B	☐ Y ☑ N
2	40	VOC	E	☑ Y ☐ N	2	125	pl	F	☐ Y ☑ N
1	250	pl	A	☐ Y ☒ N					☐ Y ☐ N
1	125	pl	A	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD: Drop off DATE SHIPPED: 7/28/22 AIRBILL NUMBER: NA

COC NUMBER: NV SIGNATURE: DATE SIGNED: 8/5/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, (JJ)	DATE: 8/1/22	BY: JK	DATE: 8-5-22

SAMPLE ID: DEKMW 22001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0920	DATE: 7/27/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.74 T/ PVC

DEPTH TO BOTTOM: 24.60 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 7 ☒ LITERS ☐ GALLONS

COLOR: Brown ODOR: none

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0955	DATE: 7/27/22

PH: 7.28 SU CONDUCTIVITY: 1730 umhos/cm

ORP: -137.9 mV DO: 0.73 mg/L

TURBIDITY: 9.90 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.3 °C OTHER:

COLOR: Clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0920	200	7.29	1712	-83.5	8.90	2400	19.6	9.64	INITIAL
0925		7.06	1686	-100.5	2.87	160.0	15.1	9.71	1
0930		7.14	1840	-124.5	1.00	50.0	14.3	9.78	2
0935		7.19	1821	-131.5	0.87	30.0	14.4	9.78	3
0940		7.28	1753	-137.8	0.79	20.0	14.5	9.78	4
0945		7.28	1734	-138.5	0.74	10.0	14.3	9.78	5
0950		7.28	1736	-138.1	0.74	10.0	14.4	9.78	6
0955		7.28	1730	-137.9	0.73	9.90	14.3	9.78	7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	DT	g/NA	A	☐ Y ☒ N	1	1LT	PL	B	☐ Y ☒ N
1	40	VOC	E	☐ Y ☒ N	1	1LT	PL	C	☐ Y ☒ N
1	40	VOC	E	☒ Y ☐ N	1	1LT	PL	E	☐ Y ☒ N
1	250	PL	A	☐ Y ☒ N					☐ Y ☐ N
1	1LT	PL	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Drop off DATE SHIPPED: 9/28/22 AIRBILL NUMBER:

COC NUMBER: NA SIGNATURE: DATE SIGNED: 9/28/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 8/5/22	BY: JK	DATE: 8-5-22

SAMPLE ID: DEKmw 22062 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0843	DATE: 7/27/22	SAMPLE	TIME: 0908	DATE: 7/27/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.29 SU	CONDUCTIVITY: 1312 umhos/cm	
			ORP: -138.0 mV	DO: 1.05 mg/L	
DEPTH TO WATER: 11.03 T/ PVC			TURBIDITY: 9.95 NTU		
DEPTH TO BOTTOM: 26.87 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 14.1 °C	OTHER:	
VOLUME REMOVED: 5 ☒ LITERS ☐ GALLONS			COLOR: clear	ODOR: non	
COLOR: Brown	ODOR: non		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: clear	FILTRATE ODOR: non	
☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0843	204	7.28	807	-60.1	8.68	436.0	18.8	1104	INITIAL
0848		7.29	1361	-130.0	1.50	46.0	14.9	1130	10
0853		7.30	1336	-137.1	1.14	26.0	14.1	1130	20
0858		7.30	1315	-137.7	1.10	10.0	14.4	1134	30
0903		7.29	1314	-138.0	1.08	10.0	14.1	1134	40
0908		7.29	1312	-138.0	1.05	9.95	14.5	1131	50
									60

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	g/ms	A	☐ Y ☒ N	1	125	pl	B	☐ Y ☑ N
1	40	VOC	E	☐ Y ☒ N	1	125	pl	C	☐ Y ☒ N
1	40	VOC	E	☒ Y ☐ N	1	125	pl	F	☐ Y ☒ N
1	250	pl	A	☐ Y ☒ N					☐ Y ☐ N
1	125	pl	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Drop off	DATE SHIPPED:	7/28/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	8/1/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 8/1/22	BY: JK	DATE: 8-5-22

SAMPLE ID: DEKMW 22003 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0807	DATE: 7/27/22	SAMPLE	TIME: 0832	DATE: 7/27/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.46 SU	CONDUCTIVITY: 741	umhos/cm
			ORP: -133.1 mV	DO: 0.91	mg/L
DEPTH TO WATER:	10.40 T/ PVC		TURBIDITY: 10.0	NTU	
DEPTH TO BOTTOM:	24.40 T/ PVC		☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 14.1 °C	OTHER:	
VOLUME REMOVED:	5 ☒ LITERS ☐ GALLONS		COLOR: Clear	ODOR: non	
COLOR:	Brown ODOR: non		FILTRATE (0.45 um) ☒ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: Clear	FILTRATE ODOR: non	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0807	200	7.38	2416	-94.7	7.81	500	16.5	10.45	INITIAL
0812		7.42	1010	-134.0	1.37	28.0	14.7	10.52	1
0817		7.47	743	-133.6	1.00	10.0	14.5	10.52	2
0822		7.47	745	-133.5	0.95	10.0	14.4	10.52	3
0827		7.46	745	-133.1	0.92	10.0	14.5	10.52	4
~~0832~~								~~10.52~~	~~5~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	9/HDPE	A	☐ Y ☒ N	1	125	P1	B	☐ Y ☒ N
1	40	VOC	E	☐ Y ☒ N	1	125	P1	C	☐ Y ☒ N
1	40	VOC	E	☒ Y ☐ N	1	125	P1	F	☐ Y ☒ N
1	250	P1	A	☐ Y ☒ N					☐ Y ☐ N
1	125	P1	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Drop off	DATE SHIPPED:	7/28/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	8/1/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 8/1/22	BY: SK	DATE: 8-5-22

SAMPLE ID: DEKMW-22004 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1005	DATE: 7/27/22	SAMPLE	TIME: 1035	DATE: 7/27/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.45 T/ PVC

DEPTH TO BOTTOM: 22.44 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS

COLOR: Brown ODOR: non

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER

PH: 7.38 SU CONDUCTIVITY: 1064 umhos/cm

ORP: -128.1 mV DO: 079 mg/L

TURBIDITY: 2.91 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.8 °C OTHER:

COLOR: Clear ODOR: non

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: non

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1005	200	7.37	1285	-92.1	9.1	350	17.8	9.61	INITIAL
1010		7.31	1243	-84.1	1.31	7.0	14.9	9.74	1
1015		7.33	1236	-107.1	1.00	3.7	14.7	9.71	2
1020		7.38	1186	-119.1	093	3.0	14.9	9.71	3
1025		7.37	1120	-128.1	083	3.0	14.9	9.71	4
1030		7.38	1092	-128.1	080	3.0	14.4	9.71	5
1035		7.38	1064	-129.5	079	2.95	14.8	9.71	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	9/45)	A	☐ Y ☑ N	1	1 L	PL	B	☐ Y ☑ N
1	40	VOC	E	☒ Y ☐ N	1	125	PL	C	☐ Y ☒ N
1	40	VOC	E	☐ Y ☒ N	1	125	PL	E	☐ Y ☒ N
1	250	PL	A	☐ Y ☒ N					☐ Y ☐ N
1	125	PL	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Drop off DATE SHIPPED: 7/28/22 AIRBILL NUMBER:

COC NUMBER: NA SIGNATURE: DATE SIGNED: 8/5/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK JJ	DATE: 7/27/22	BY: JK	DATE: 8-5-22

SAMPLE ID: DEKMW-2205 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1057	DATE: 7/27/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 8.19 T/ PVC

DEPTH TO BOTTOM: 20.36 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: non

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☒ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1117	DATE: 7/27/22

PH: 7.46 SU CONDUCTIVITY: 743 umhos/cm

ORP: -145.3 mV DO: 1.07 mg/L

TURBIDITY: 2.3 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 16.0 °C OTHER:

COLOR: clear ODOR: non

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: non

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1057	204	7.46	1098	-72.5	8.46	10.0	22.6	8.45	INITIAL
1102		7.39	1741	-132.5	1.54	2.8	16.2	8.46	1
1107		7.40	1744	-145.7	1.10	2.7	16.0	8.46	2
1112		7.46	1744	-145.5	1.09	2.5	16.0	8.46	3
1117		7.40	1743	-145.3	1.07	2.3	16.0	8.46	4
~~1122~~									~~5~~
~~1127~~									~~6~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☒ N	1	125	P1	B	☐ Y ☒ N
1	40	VOC	E	☒ Y ☐ N	1	125	P1	C	☐ Y ☒ N
1	40	VOC	E	☐ Y ☒ N	1	125	P1	B	☐ Y ☒ N
1	250	P1	A	☐ Y ☒ N					☐ Y ☐ N
1	125	P1	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Drop off	DATE SHIPPED:	7/28/22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	8/5/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 8/17/22	BY: JK	DATE: 8-5-22

SAMPLE ID: DEKMW-220064 — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0729	DATE: 7/27/22	SAMPLE	TIME: 0749	DATE: 7/27/22
PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER			PH: 7.34 SU	CONDUCTIVITY: 2817	umhos/cm
			ORP: -132.8 mV	DO: 0.92	mg/L
DEPTH TO WATER: 8.75 T/ PVC			TURBIDITY: 4.7 NTU		
DEPTH TO BOTTOM: 17.08 T/ PVC			☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 16.1 °C	OTHER:	
VOLUME REMOVED: 4 ☑ LITERS ☐ GALLONS			COLOR: Clear	ODOR: none	
COLOR: Brown	ODOR:		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: Clear	FILTRATE ODOR: non	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD	☐ DUP-	
DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0729	200	7.09	2181	-78.1	8.3	300	17.6	9.15	INITIAL
0734		7.31	2817	-127.3	1.17	10.0	16.5	9.28	1.6
0739		7.34	2837	-132.1	0.99	5.0	16.1	9.28	2
0744		7.34	2803	-132.5	0.97	5.0	16.5	9.28	3.0
0749		7.34	2817	-132.8	0.92	4.7	16.1	9.28	4
									~~5.6~~
									6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	9/NO3	A	☐ Y ☑ N	1	125	PL	B	☐ Y ☑ N
1	40	VOC	E	☐ Y ☑ N	1	125	PL	C	☐ Y ☑ N
1	40	VOC	E	☑ Y ☐ N	1	125	PL	F	☐ Y ☑ N
1	250	PL	A	☐ Y ☑ N					☐ Y ☐ N
1	125	PL	A	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD:	DATE SHIPPED:	AIRBILL NUMBER:
COC NUMBER: N/A	SIGNATURE:	DATE SIGNED: 8/5/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 7-26-22	BY: AW	DATE: 8/18/22

SAMPLE ID: EB - KLI | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER N/A

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER N/A

SAMPLE TYPE: ~~GW~~ ☐ WW ☐ SW ☒ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME:	DATE:	SAMPLE	TIME: 1400	DATE: 7-26-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: _____ T/ PVC

DEPTH TO BOTTOM: _____ T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: _____ ☐ LITERS ☐ GALLONS

COLOR: _____ ODOR: _____

TURBIDITY ☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☐ GROUND ☐ DRUM ☐ OTHER

PH: _____ SU CONDUCTIVITY: _____ umhos/cm

ORP: _____ mV DO: _____ mg/L

TURBIDITY: _____ NTU

☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: _____ °C OTHER: _____

COLOR: _____ ODOR: _____

FILTRATE (0.45 um) ☑ YES ☐ NO

FILTRATE COLOR: _____ FILTRATE ODOR: _____

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
									INITIAL

Equipment Blank

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1	↓	↓	B	☐ Y ☒ N					☐ Y ☐ N
1			C	☐ Y ☒ N					☐ Y ☐ N
1			D	☐ Y ☒ N					☐ Y ☐ N
1	40mL	VOA	E	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	7-26-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	8-5-22

CHAIN OF CUSTODY

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q3-2022 DEK Bottom Ash Pond Wells

PROJECT NUMBER: 22-0768

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0768-01	7/26/22	1141	GW	DEK-MW-15002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02		857	GW	DEK-MW-15005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03		1038	GW	DEK-MW-15006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04		—	GW	DUP-DEK-BAP-01	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05		857	W	FB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	
-06		857	W	EB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 7-26-22 / 1530 RECEIVED BY: FedEx

RELINQUISHED BY: FedEx DATE/TIME: 07-27-22 4:00 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 0.2-4.6 °C Cal. Due Date: 5-25-23

27 of 80

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SAMPLING SITE / CUSTOMER: Q3-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-0769

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: Henry Schmidt

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0769-01	7/26/22	1235	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	↓	1235	GW	DEK-MW-18001 MS	8	3	1	1	1	2			x	x	x		x	x	x	x	
-03	↓	1235	GW	DEK-MW-18001 MSD	8	3	1	1	1	2			x	x	x		x	x	x	x	

RELINQUISHED BY: Henry Schmidt — DATE/TIME: 7/26/22 1600 — RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex — DATE/TIME: 07-27-22 11:00 — RECEIVED BY:

COMMENTS:

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

Temperature: 0.6 °C — Cal. Due Date: 5-25-23

20 of 50

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SAMPLING SITE / CUSTOMER: Q3-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-0770

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	Dissolved Metals	REMARKS
22-0770-01	7-26-22	1346	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-02	7-26-22	1129	GW	OW-10	~~10~~ 12	4	~~1~~ 2	1	1	2			x	x	x	x	x	x	x	x	X	
-03	7-26-22	1237	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-04	7-26-22	1031	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-05	7-26-22	0949	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-06	7-26-22	0939	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-07	7-26-22	0905	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-08	7-26-22	—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x		
-09	7-26-22	1400	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		
-10	7-26-22	1129	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x		

RELINQUISHED BY: [signature] DATE/TIME: 7-26-22 / 1530 RECEIVED BY: Fed Ex

RELINQUISHED BY: Fed Ex DATE/TIME: 07-27-22 11:00 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 2.4 - 5.6 °C Cal. Due Date: 5-25-23

24 of 30

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

SAMPLING SITE / CUSTOMER: Q3-2022 DEK Bottom Ash Supplemental

PROJECT NUMBER: 22-0771

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-0771-01	7/27/23	0847	GW	DEK-MW-15004	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	"	0845	GW	DEK-MW-22001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	"	0905	GW	DEK-MW-22002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	"	0838	GW	DEK-MW-22003	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	"	1037	GW	DEK-MW-22004	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-06	"	1117	GW	DEK-MW-22005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-07	"	0749	GW	DEK-MW-22006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-08	"	—	GW	DUP-DEK-BAP-02	9	4	1	1	1	2			x	x	x	x	x	x	x	x	

30 of 30

RELINQUISHED BY: DATE/TIME: 7/28/23 0715 RECEIVED BY:

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

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

Temperature: 1.6-3.4 °C Cal. Due Date: 5-25-23

Appendix C
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event July 2022
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the July 2022 sampling event. The sample was analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analysis was subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 22-0769, S38577.01(01), and 83519.

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

- DEK-MW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate, Nitrate, Nitrite)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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

Data Usability Review Procedure

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

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

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.
- A field blank was not collected with this data set.
- An equipment blank was not collected with this data set.
- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, ammonia, alkalinity, sulfide, TOC, and DOC. The recoveries were within the acceptance limits. Relative percent differences (RPDs) were within the acceptance limits for TOC and DOC but were not provided by the laboratory for the remaining parameters and therefore

were not evaluated; further, with the exception of sulfide, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.

- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The DOC result was greater than the TOC result by more than 20% for sample DEK-MW-18001 where the results were >5x the RL. The positive results for DOC and TOC in this sample are potentially uncertain as summarized in the attached table, Attachment A.

Attachment A
Summary of Data Non-Conformances for Impoundment Groundwater Analytical Data
DE Karn Bottom Ash Pond and Lined Impoundment Wells
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-18001	7/26/2022	TOC/DOC	The dissolved concentration was higher than the total concentration by >20% and total and dissolved results > 5x the RL. The positive results for DOC and TOC in this sample are potentially uncertain

Laboratory Data Quality Review
Groundwater/Surface Water Monitoring Event July 2022
DE Karn Lined Impoundment

Groundwater and surface water samples were collected by TRC for the July 2022 sampling event. Samples were analyzed for total and dissolved metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analyses were subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 22-0770, S38578.01(01), and 83522.

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

- OW-10
- OW-11
- OW-12
- DEK-MW-15003

During the July 2022 sampling event, the following water/surface water samples were collected:

- KLI-SCS
- KLI-PCS
- SW-DITCH

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

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate, Nitrate, Nitrite)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total and Dissolved Metals	SW-846 6020A/6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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

Data Usability Review Procedure

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

- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.
- One field blank (FB-KLI) and one equipment blank (EB-KLI) were collected with this data set. Target analytes were not detected in these blank samples with the following exception.

- DOC was detected at 1000 µg/L in FB-KLI. The positive results for DOC in select groundwater samples are potential false positive results or potentially biased high as summarized in the attached table, Attachment A.

- MS and MSD analyses were performed on sample KLI-PCS for TOC/DOC. All criteria were met.
- The field duplicate pair samples were DUP-KLI and OW-12; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The DOC result was greater than the TOC result by more than 20% for sample DEK-MW-15003 where one of the two results was >5x the RL. The positive results for DOC and TOC in these samples are potentially uncertain as summarized in the attached table, Attachment A.
- The dissolved potassium result was greater than the total potassium result by more than 20% for sample OW-10 where both results were >5x the RL. The positive results for total and dissolved potassium in sample OW-10 are potentially uncertain as summarized in the attached table, Attachment A.
- The RL for dissolved silver in sample OW-10 (0.3 µg/L) was raised to due to matrix interference. Sample OW-10 was non-detect for silver at the stated RL, which is above the requested RL of 0.2 µg/L.

Attachment A
Summary of Data Non-Conformances for Impoundment Groundwater and Surface Water Analytical Data
DE Karn Lined Impoundment Wells
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
OW-12	44768.00	DOC	Potential false positive or high biased results due to field blank contamination.
KLI-SCS	44768.00		
KLI-PCS	44768.00		
DEK-MW-15003	44768.00	TOC/DOC	The dissolved concentration was higher than the total concentration by >20% and total or dissolved result ≥ 5x the RL. The positive results for the total and dissolved fractions are potentially uncertain.
OW-10	44768.00	Potassium	

Appendix D
Statistical Analysis

Appendix D
Statistical Summary for DE Karn Lined Impoundment
Third Quarter 2022
Data from October 2020 to July 2022

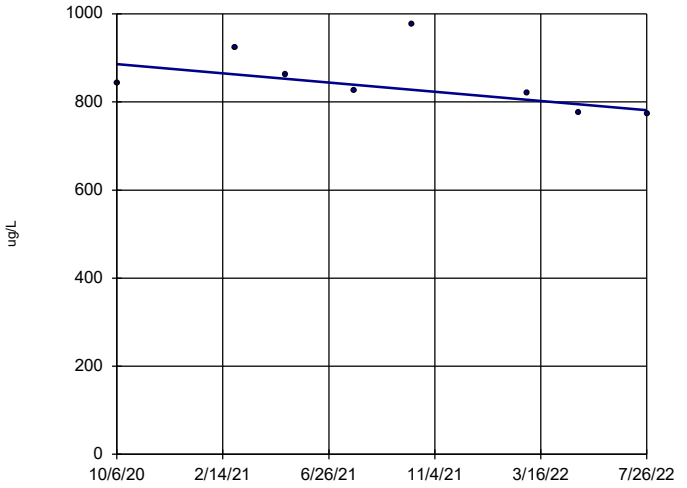
Karn Lined Impoundment Wells						
PARAMETER	**Range, Test, or Limit**	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**
Boron	Trend	O	O	O	↑ ASD	O
Calcium	Trend	O	O	O	↓	O
Chloride	Trend	↑ ASD	O	O	↓	O
Fluoride	Trend	O*	O*	O*	↓	O*
Iron	Trend	O	O	O	O	O
pH	Trend	O	O	O	↑ ASD	O
Sulfate	Trend	O	O	O	↓*	O
Total Dissolved Solids	Trend	↑*	O	O	O	O

Notes:

O* = Non-detect
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (First Quarter 2022 Hydrogeological Monitoring Report for the Karn Lined Impoundment CCR Unit, TRC, April 2022.)

Boron, Total

DEK-MW-15003



n = 8

Slope = -58.33 units per year.

Mann-Kendall statistic = -16
critical = -17

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

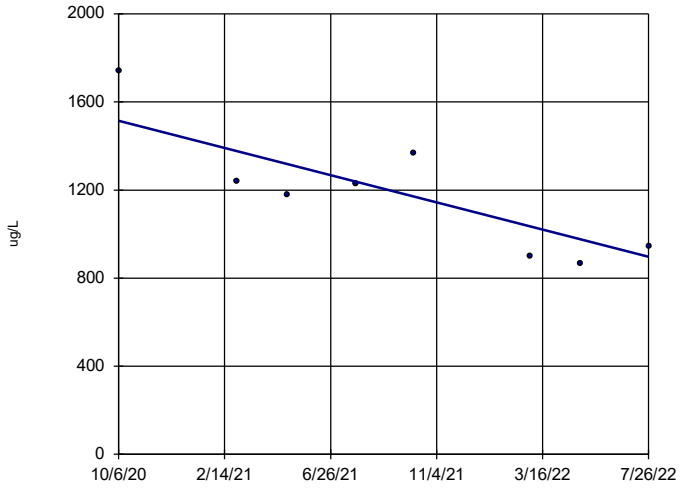
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Boron, Total

DEK-MW-18001



n = 8

Slope = -341.9 units per year.

Mann-Kendall statistic = -16
critical = -17

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

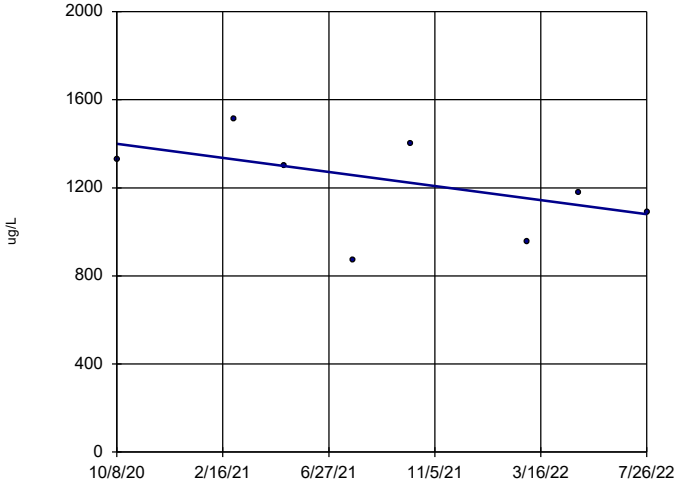
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Boron, Total

OW-10



n = 8

Slope = -177.2 units per year.

Mann-Kendall statistic = -10
critical = -17

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

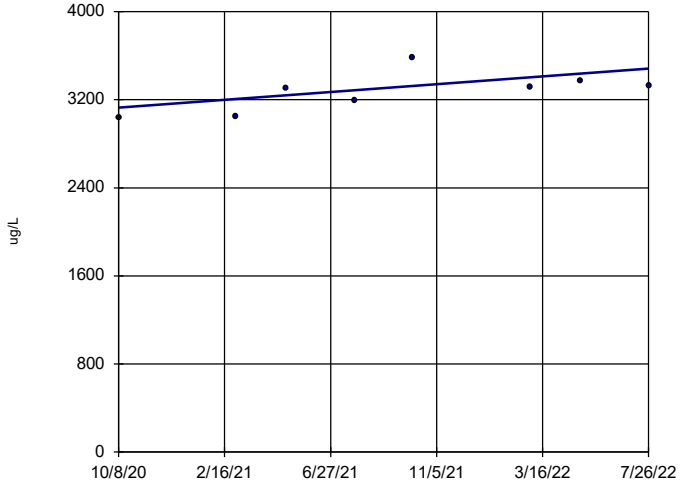
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Boron, Total

OW-11



n = 8

Slope = 196.8 units per year.

Mann-Kendall statistic = 18
critical = 17

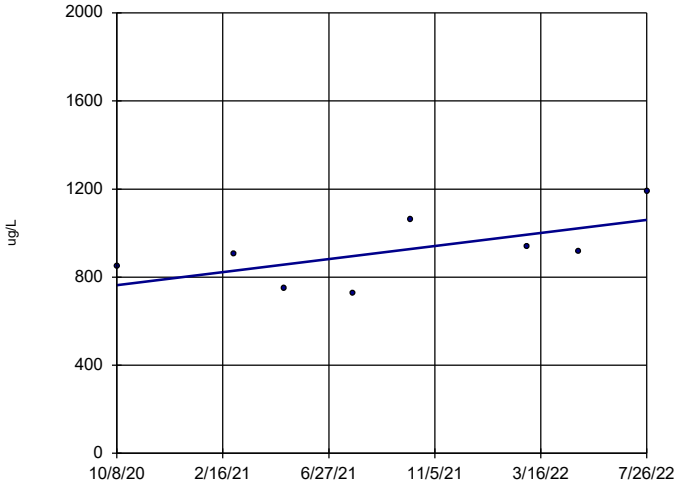
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Boron, Total

OW-12



n = 8

Slope = 165.2 units per year.

Mann-Kendall statistic = 12 critical = 17

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

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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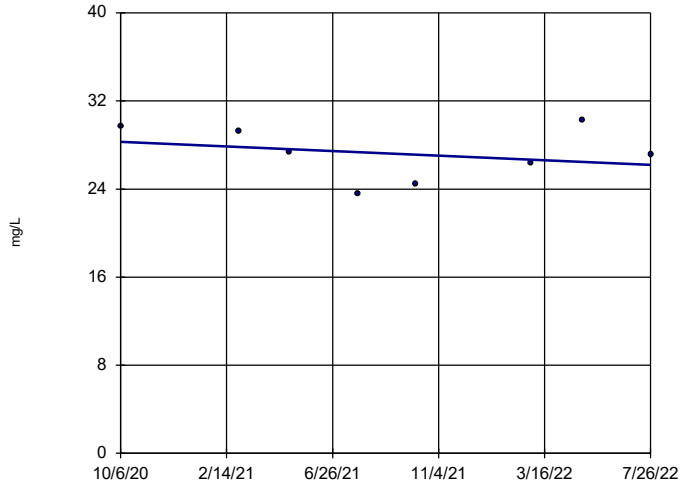
Calcium, Total

DEK-MW-15003



n = 8

Slope = -1.164 units per year.

Mann-Kendall statistic = -4 critical = -17

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

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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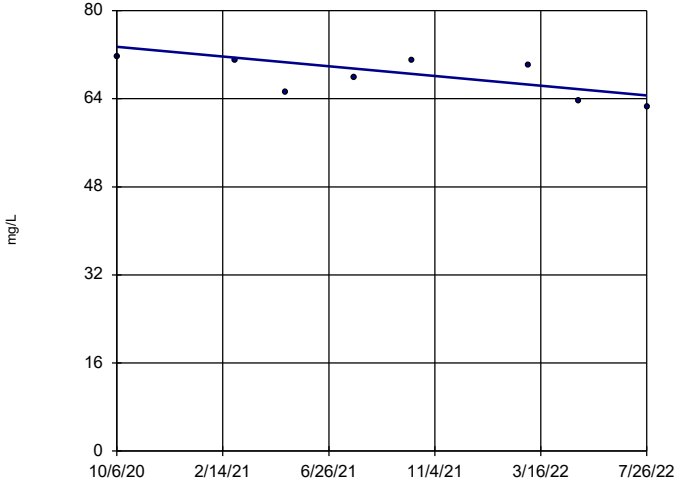
Calcium, Total

DEK-MW-18001



n = 8

Slope = -4.902 units per year.

Mann-Kendall statistic = -17 critical = -17

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

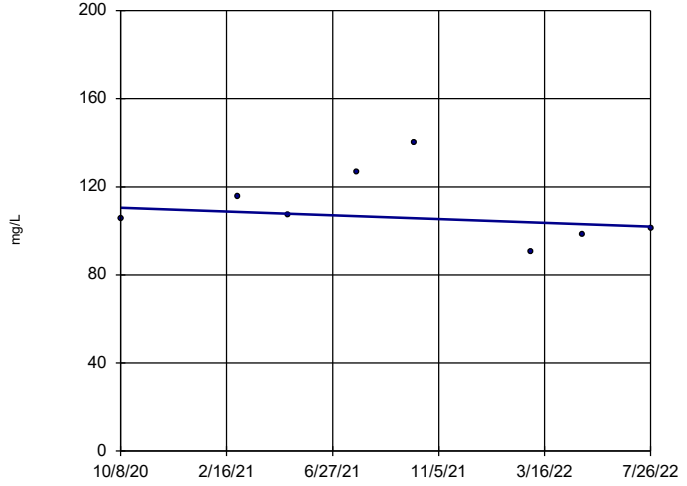
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Calcium, Total

OW-10



n = 8

Slope = -4.741 units per year.

Mann-Kendall statistic = -4 critical = -17

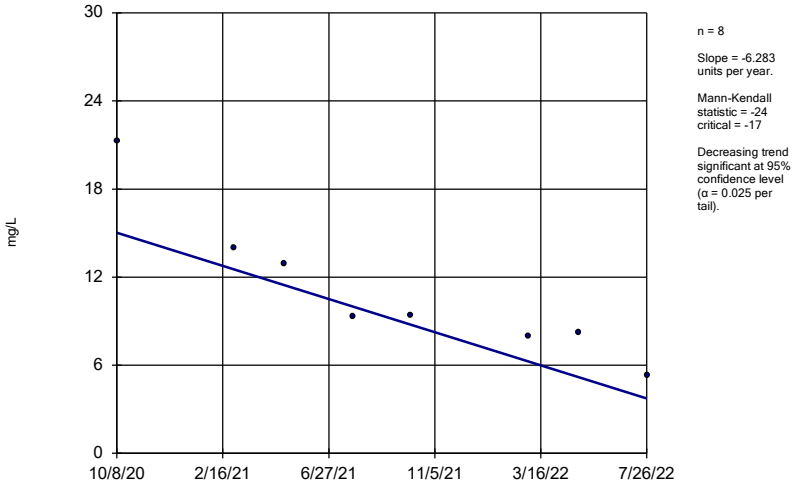
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Calcium, Total

OW-11



n = 8

Slope = -6.283 units per year.

Mann-Kendall statistic = -24 critical = -17

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

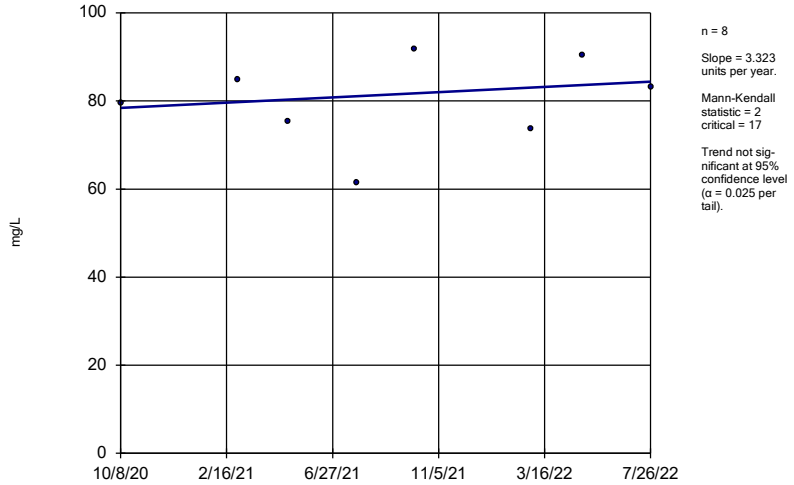
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Calcium, Total

OW-12



n = 8

Slope = 3.323 units per year.

Mann-Kendall statistic = 2 critical = 17

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

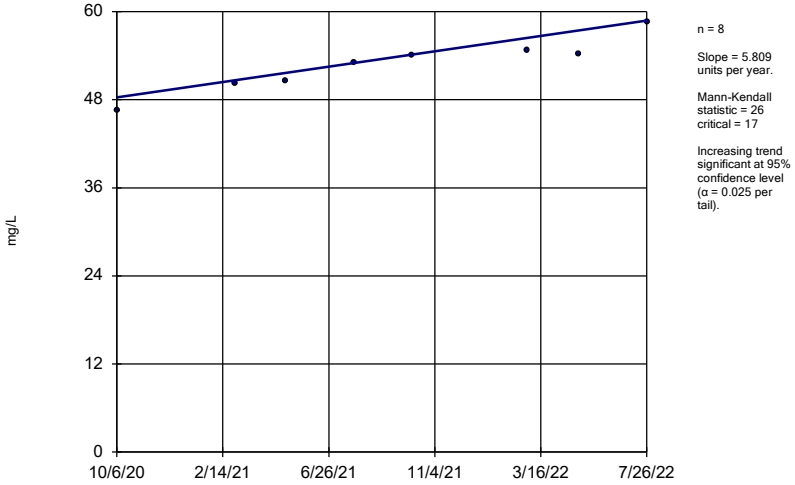
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Chloride

DEK-MW-15003



n = 8

Slope = 5.809 units per year.

Mann-Kendall statistic = 26 critical = 17

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

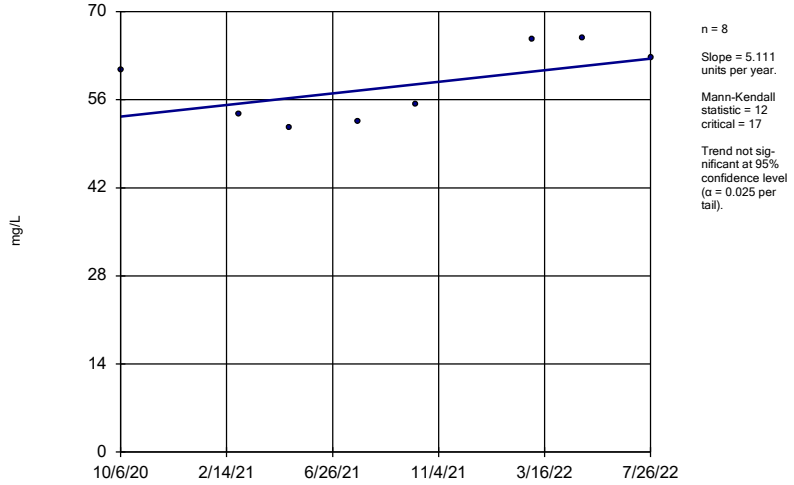
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Chloride

DEK-MW-18001



n = 8

Slope = 5.111 units per year.

Mann-Kendall statistic = 12 critical = 17

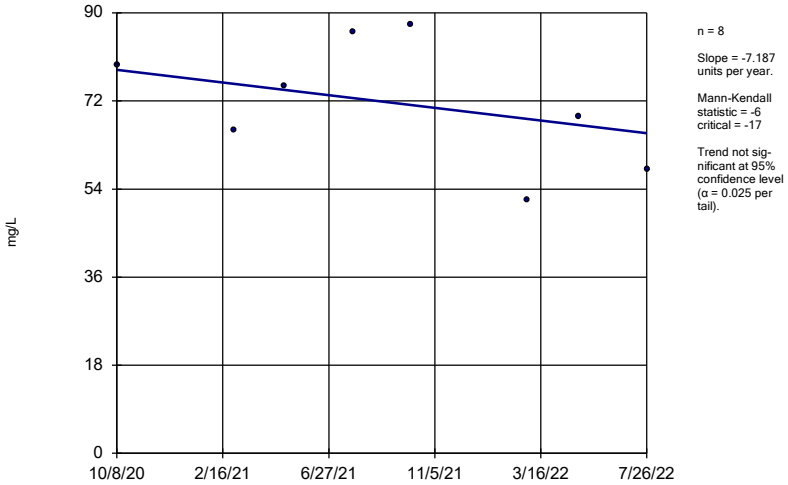
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Chloride

OW-10



n = 8

Slope = -7.187 units per year.

Mann-Kendall statistic = -6
critical = -17

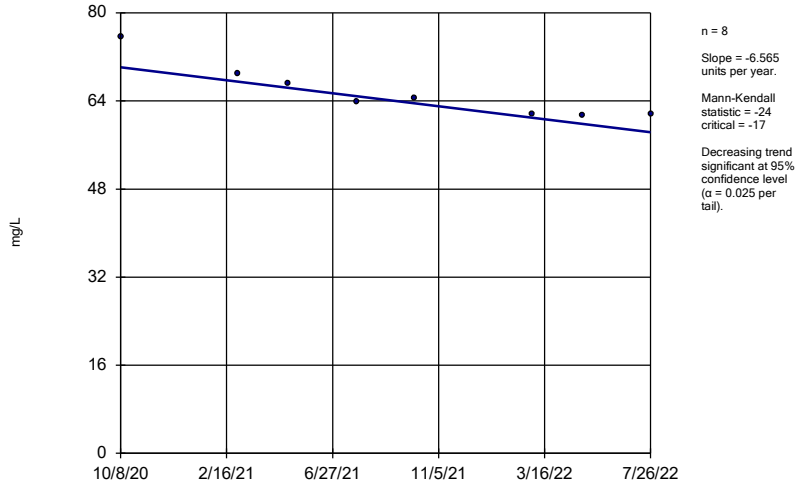
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Chloride

OW-11



n = 8

Slope = -6.565 units per year.

Mann-Kendall statistic = -24
critical = -17

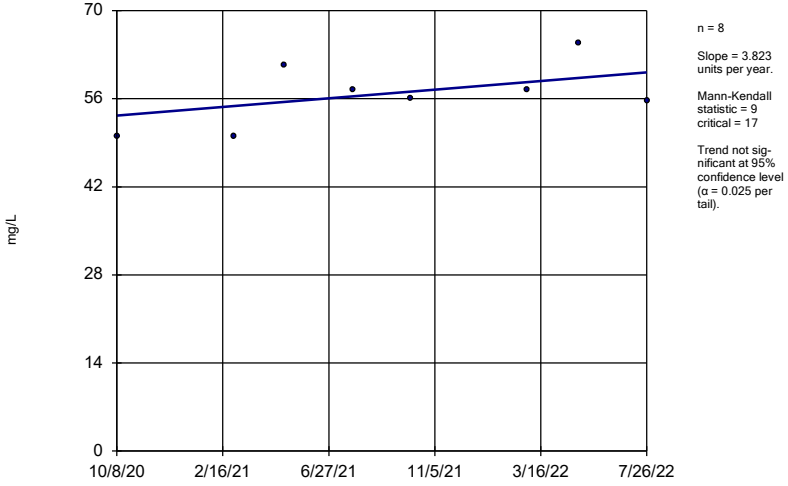
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Chloride

OW-12



n = 8

Slope = 3.823 units per year.

Mann-Kendall statistic = 9
critical = 17

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

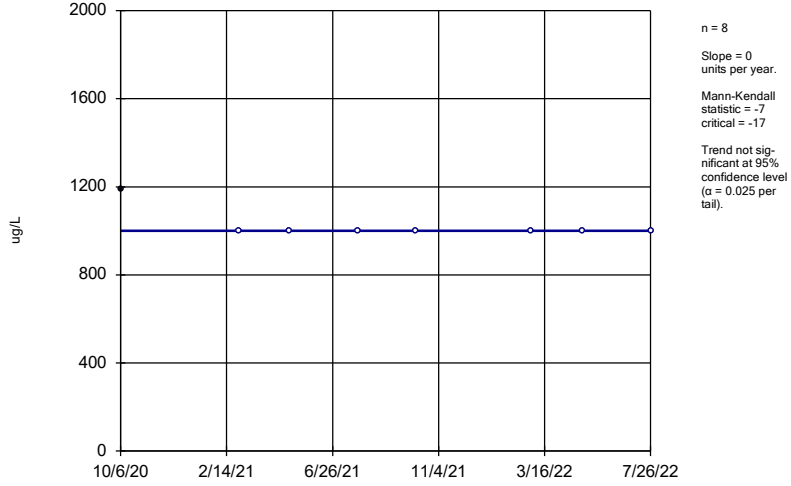
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Hollow symbols indicate censored values.

Fluoride

DEK-MW-15003



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -7
critical = -17

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

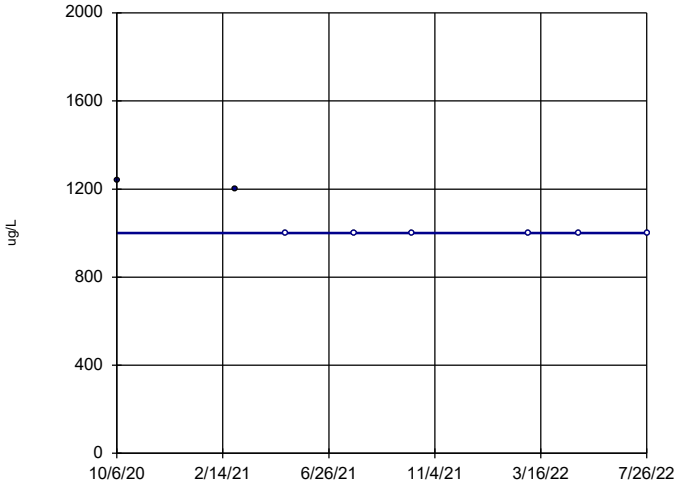
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Fluoride

DEK-MW-18001



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -13
critical = -17

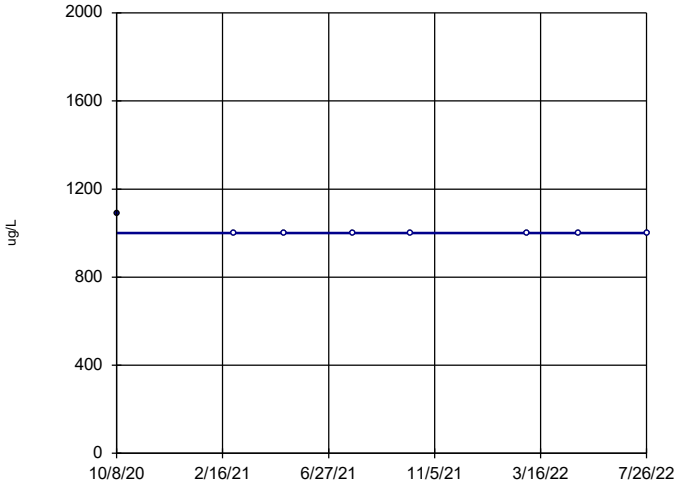
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Fluoride

OW-10



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -7
critical = -17

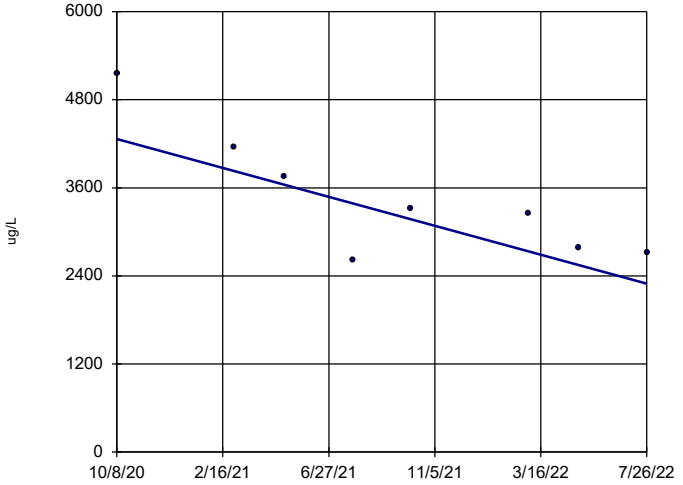
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Fluoride

OW-11



n = 8

Slope = -1096 units per year.

Mann-Kendall statistic = -20
critical = -17

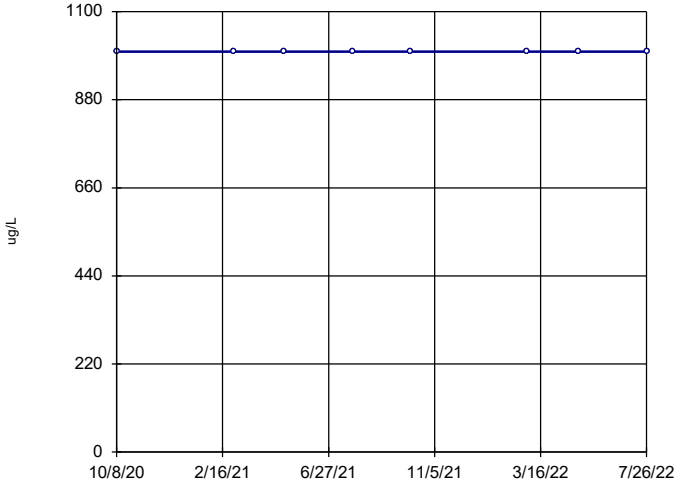
Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Fluoride

OW-12



n = 8

Slope = 0 units per year.

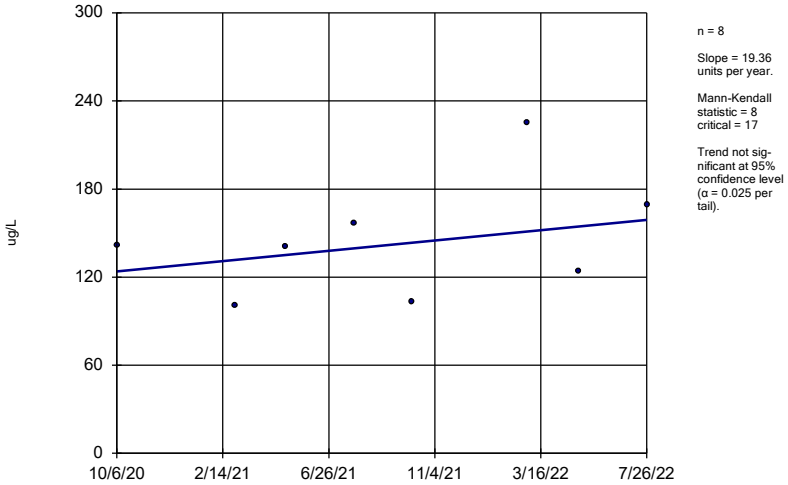
Mann-Kendall statistic = 0
critical = 17

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

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Iron, Total

DEK-MW-15003



n = 8

Slope = 19.36 units per year.

Mann-Kendall statistic = 8 critical = 17

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

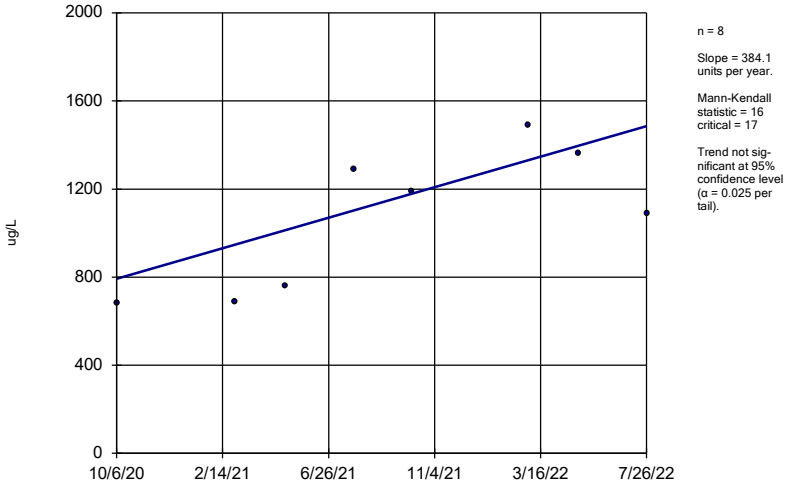
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Iron, Total

DEK-MW-18001



n = 8

Slope = 384.1 units per year.

Mann-Kendall statistic = 16 critical = 17

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

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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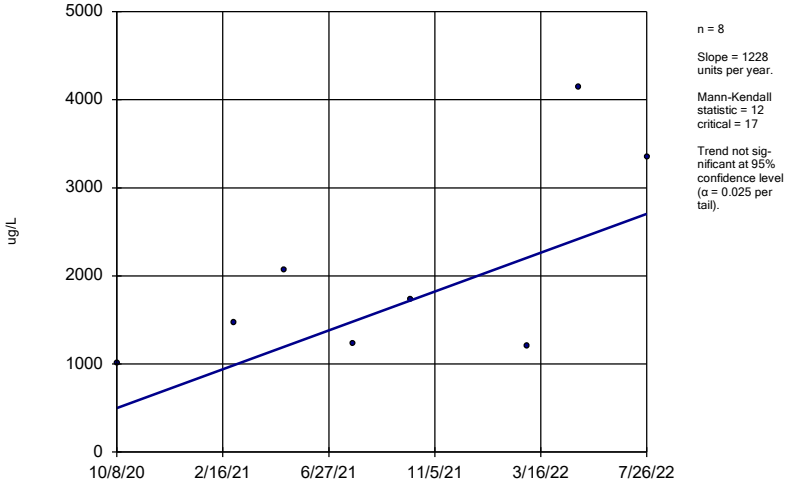
Iron, Total

OW-10



n = 8

Slope = 1228 units per year.

Mann-Kendall statistic = 12 critical = 17

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

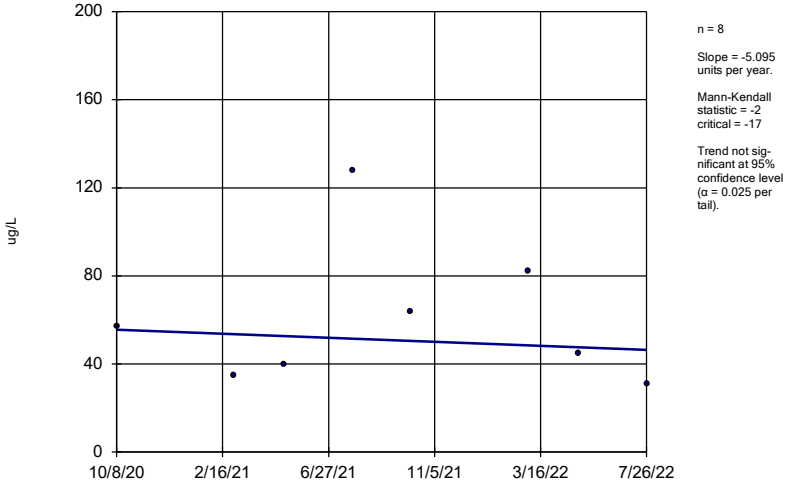
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Iron, Total

OW-11



n = 8

Slope = -5.095 units per year.

Mann-Kendall statistic = -2 critical = -17

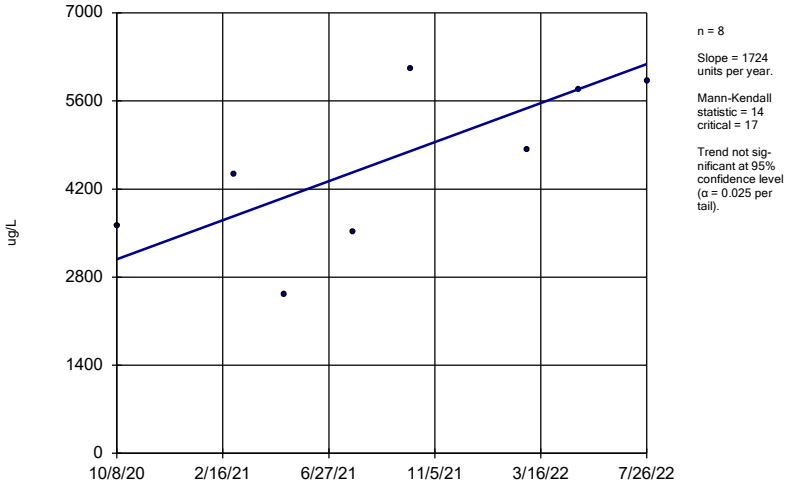
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Iron, Total

OW-12



n = 8

Slope = 1724 units per year.

Mann-Kendall statistic = 14 critical = 17

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

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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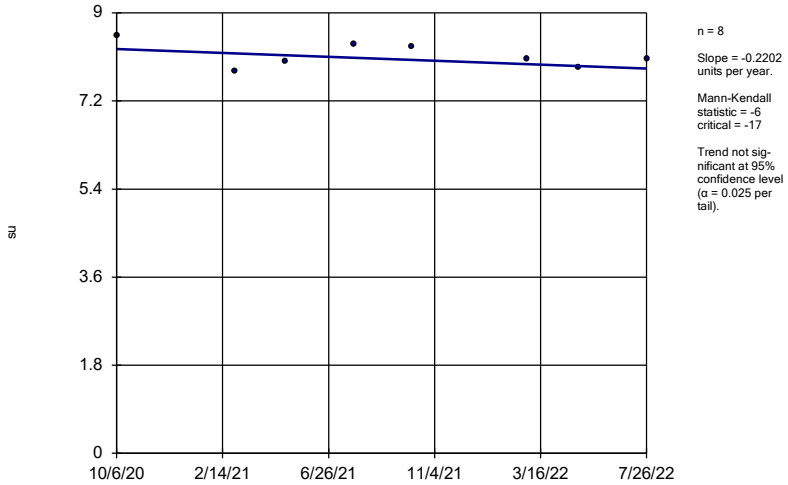
pH, Field

DEK-MW-15003



n = 8

Slope = -0.2202 units per year.

Mann-Kendall statistic = -6 critical = -17

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

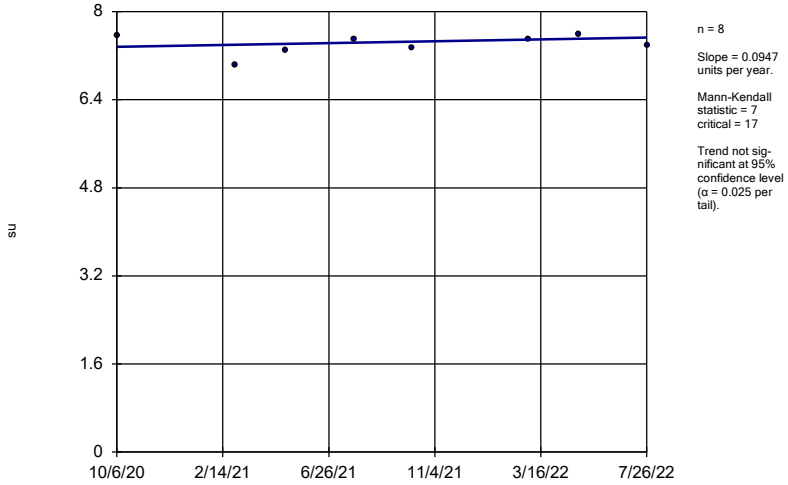
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

pH, Field

DEK-MW-18001



n = 8

Slope = 0.0947 units per year.

Mann-Kendall statistic = 7 critical = 17

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

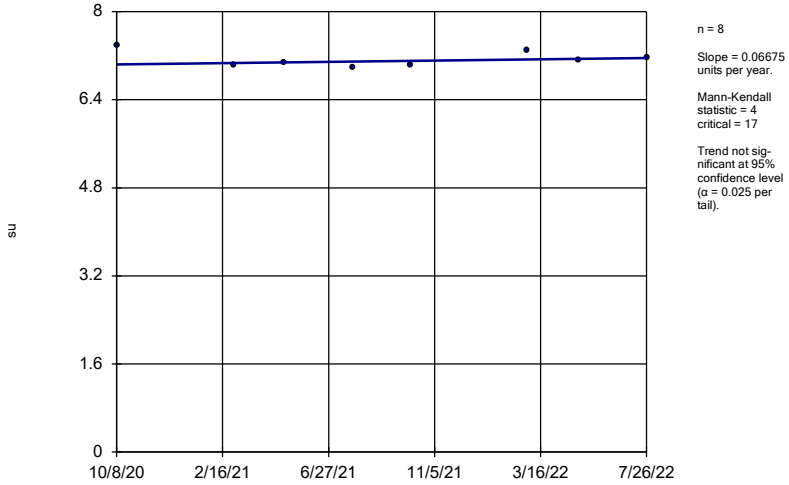
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

pH, Field

OW-10



n = 8

Slope = 0.06675 units per year.

Mann-Kendall statistic = 4 critical = 17

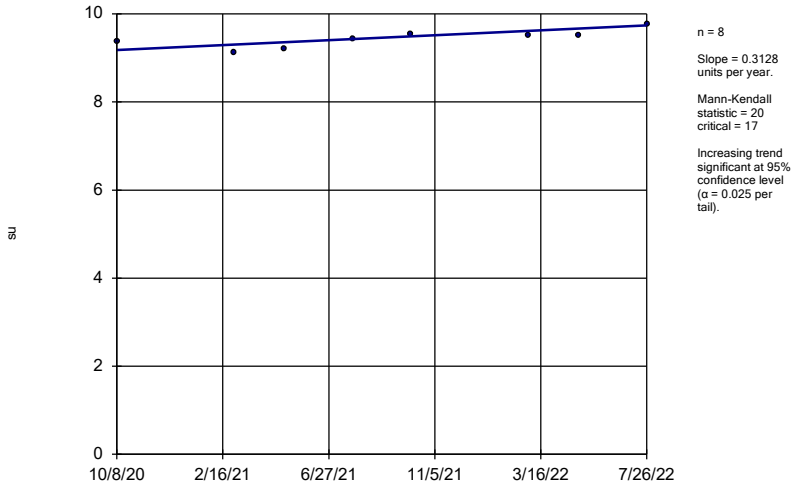
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

pH, Field

OW-11



n = 8

Slope = 0.3128 units per year.

Mann-Kendall statistic = 20 critical = 17

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

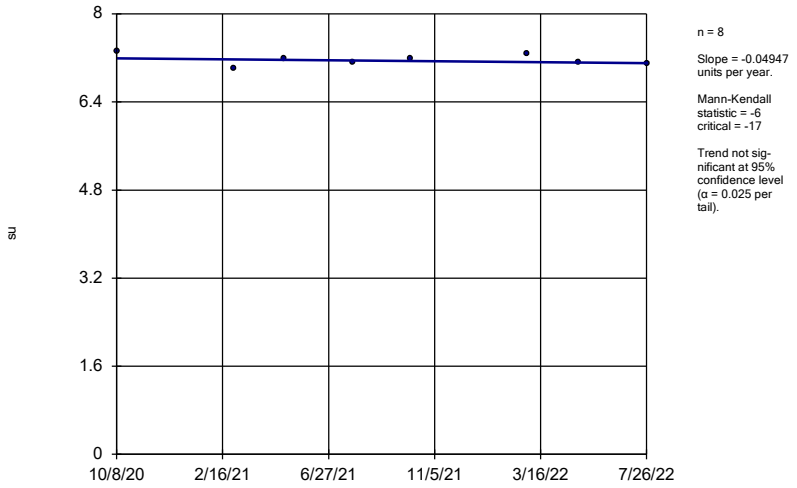
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

pH, Field

OW-12



n = 8

Slope = -0.04947 units per year.

Mann-Kendall statistic = -6 critical = -17

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

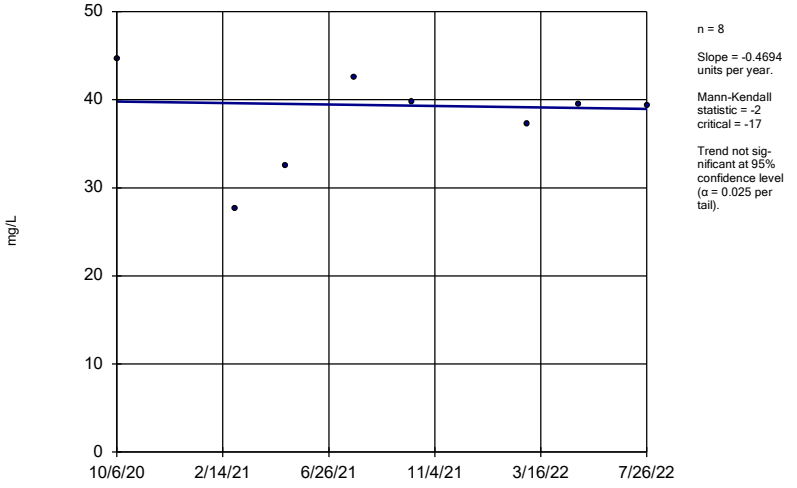
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Sulfate

DEK-MW-15003



n = 8

Slope = -0.4694 units per year.

Mann-Kendall statistic = -2 critical = -17

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

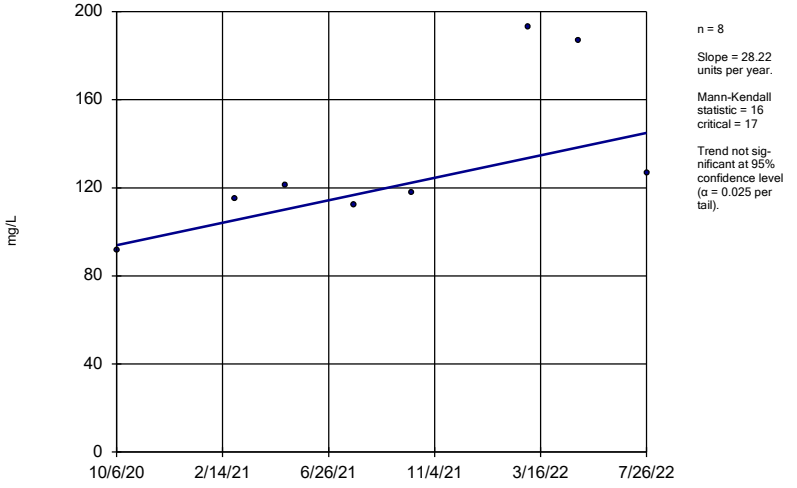
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Sulfate

DEK-MW-18001



n = 8

Slope = 28.22 units per year.

Mann-Kendall statistic = 16 critical = 17

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

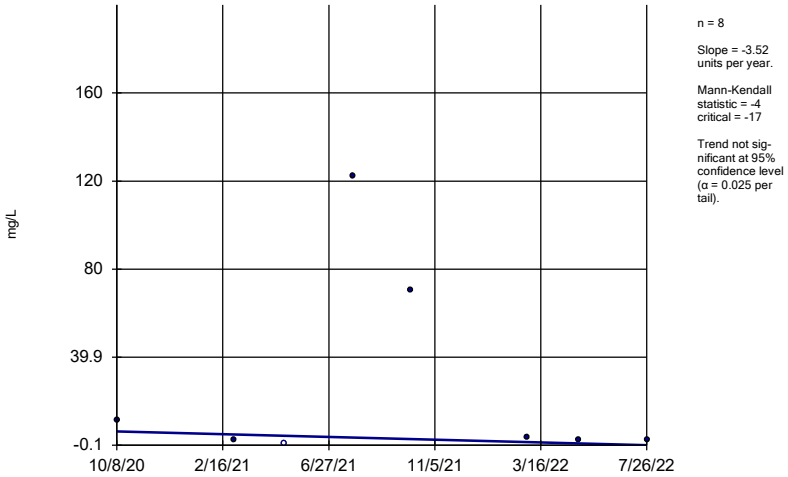
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Hollow symbols indicate censored values.

Sulfate

OW-10



n = 8

Slope = -3.52 units per year.

Mann-Kendall statistic = -4
critical = -17

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

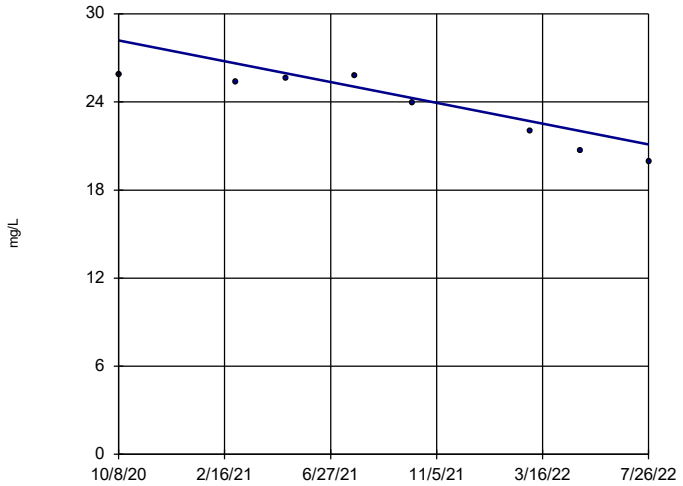
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Sulfate

OW-11



n = 8

Slope = -3.953 units per year.

Mann-Kendall statistic = -22
critical = -17

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

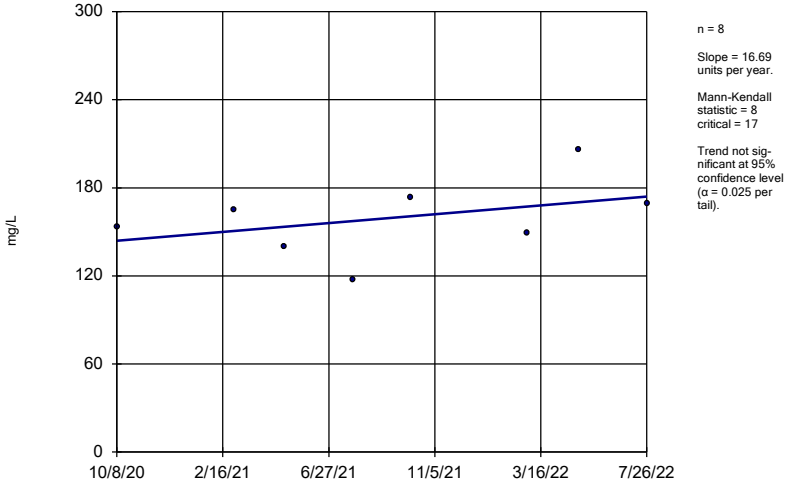
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Sulfate

OW-12



n = 8

Slope = 16.69 units per year.

Mann-Kendall statistic = 8
critical = 17

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

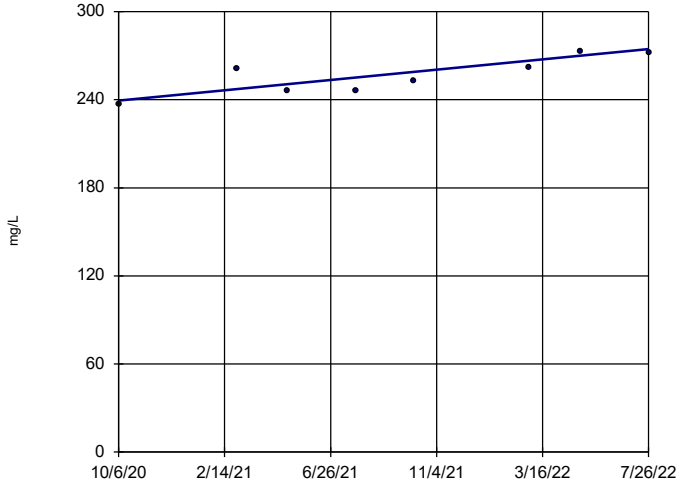
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Total Dissolved Solids

DEK-MW-15003



n = 8

Slope = 19.41 units per year.

Mann-Kendall statistic = 19
critical = 17

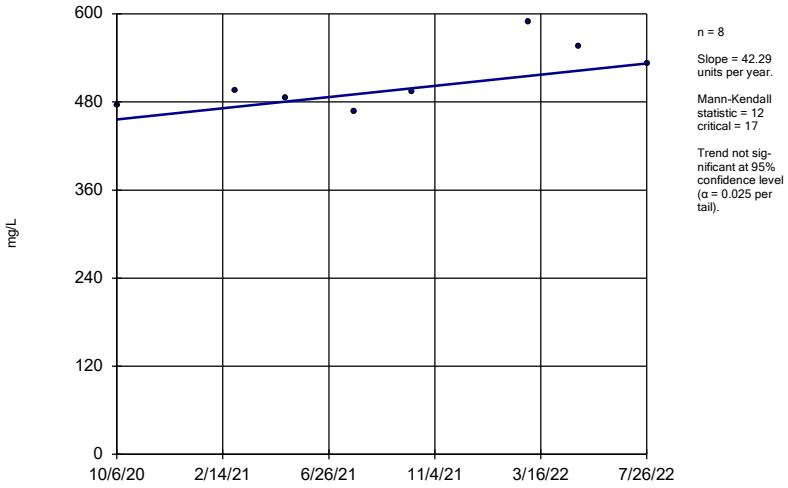
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

Total Dissolved Solids

DEK-MW-18001



n = 8

Slope = 42.29 units per year.

Mann-Kendall statistic = 12 critical = 17

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

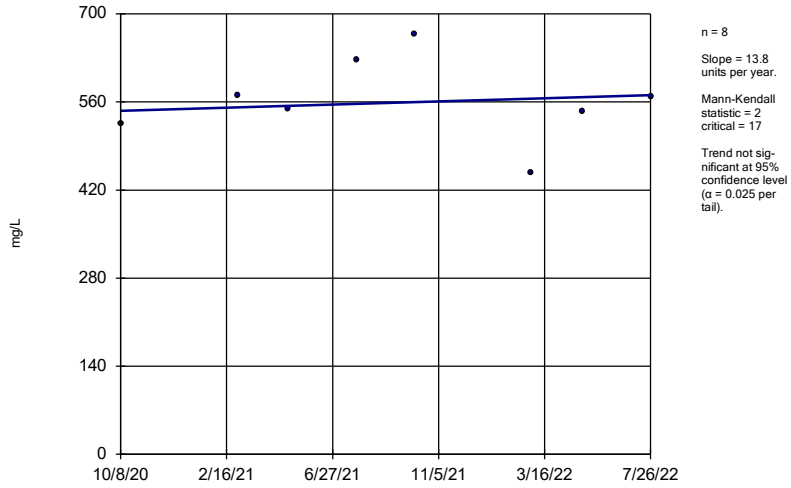
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Total Dissolved Solids

OW-10



n = 8

Slope = 13.8 units per year.

Mann-Kendall statistic = 2 critical = 17

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

Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

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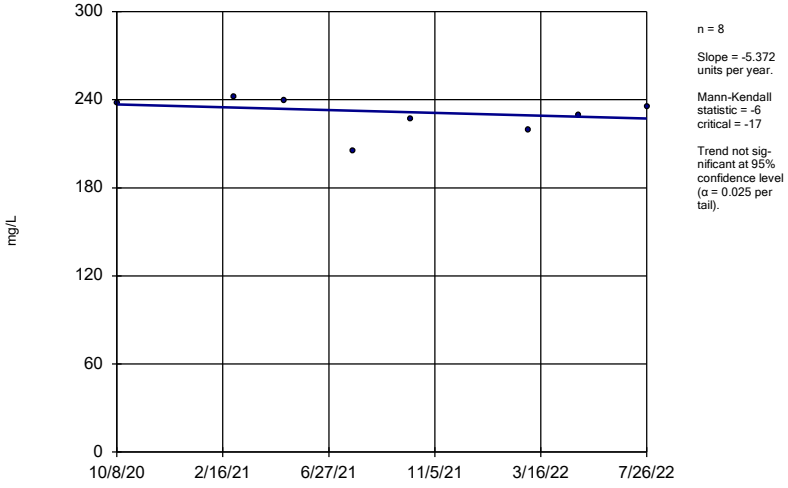
Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG

Total Dissolved Solids

OW-11



n = 8

Slope = -5.372 units per year.

Mann-Kendall statistic = -6 critical = -17

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

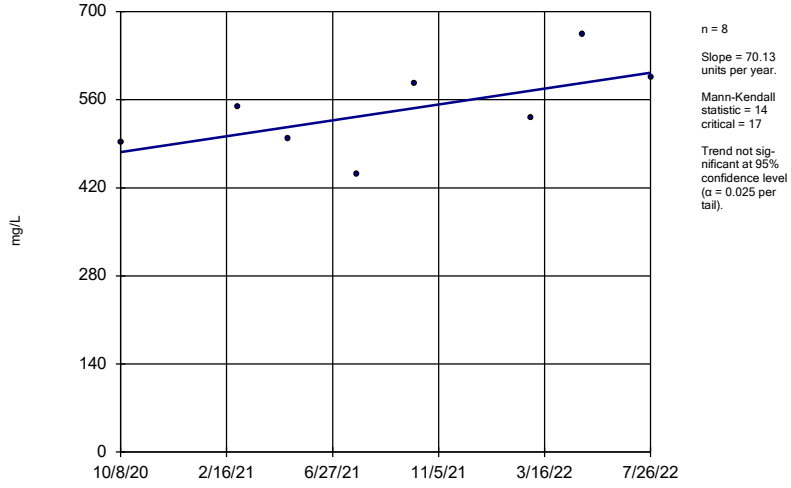
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

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

Total Dissolved Solids

OW-12



n = 8

Slope = 70.13 units per year.

Mann-Kendall statistic = 14 critical = 17

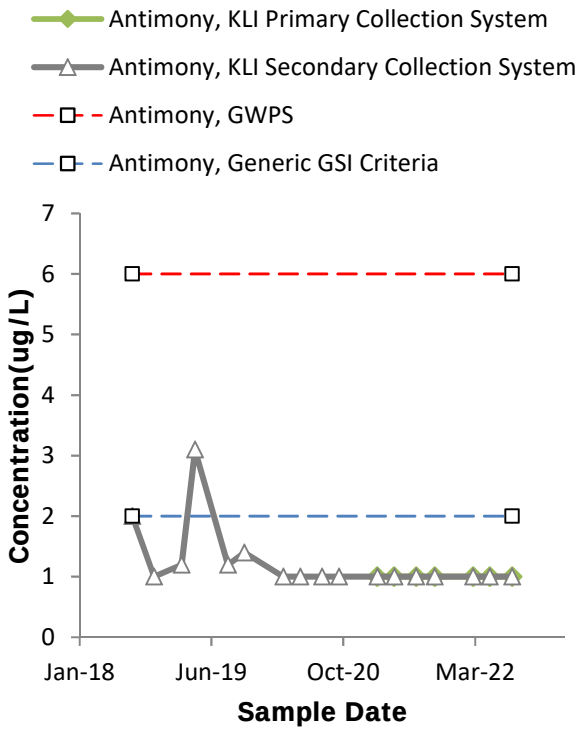
Trend not significant at 95% confidence level (α = 0.025 per tail).

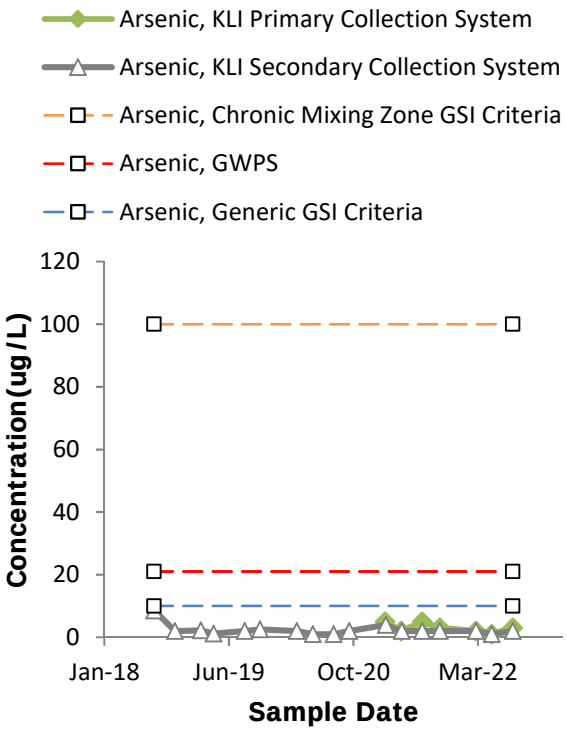
Sen's Slope Estimator Analysis Run 8/31/2022 1:01 PM

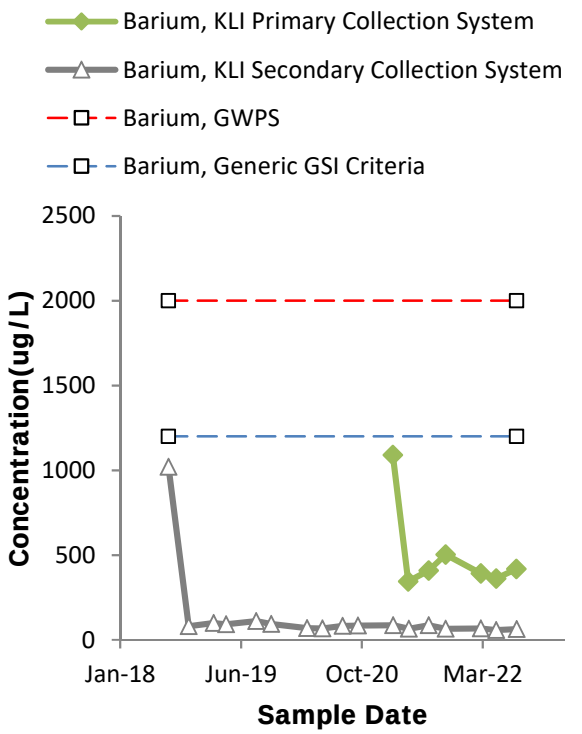
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q3

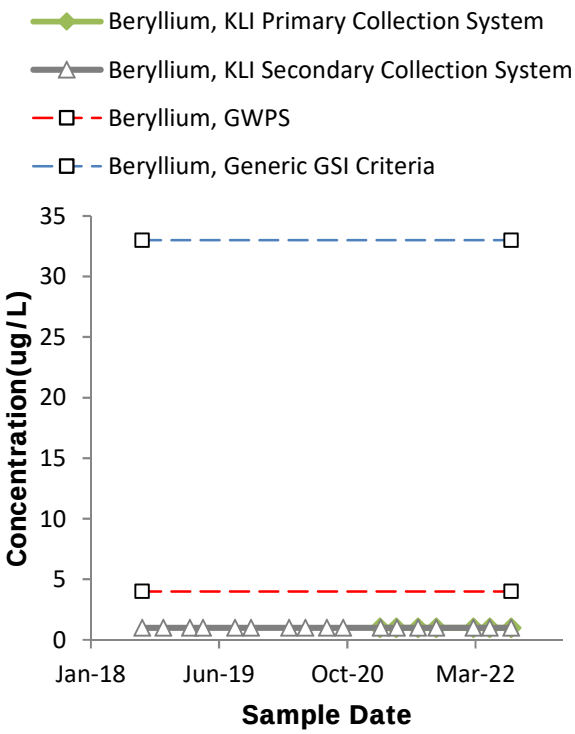
Appendix E
Secondary Leachate Collection System Monitoring

Water Quality Time Series

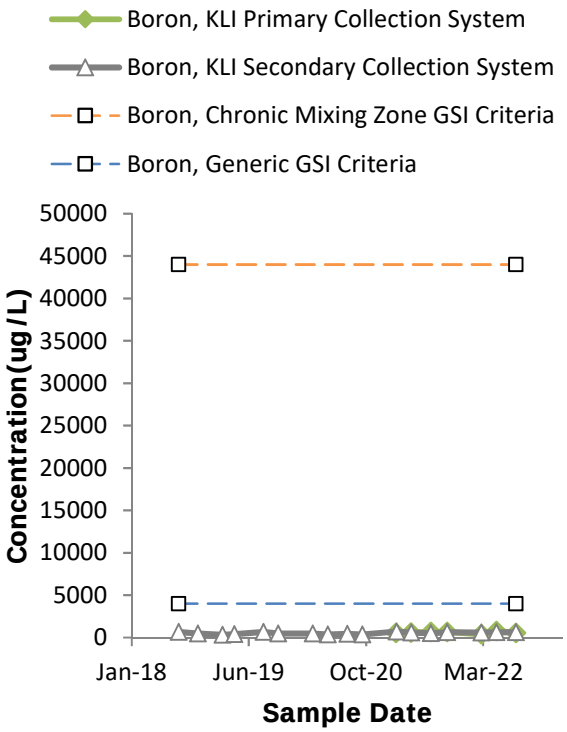


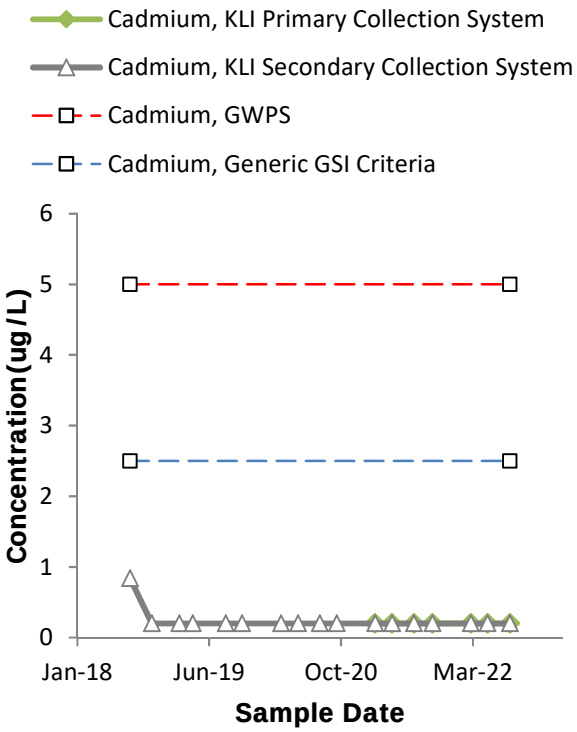


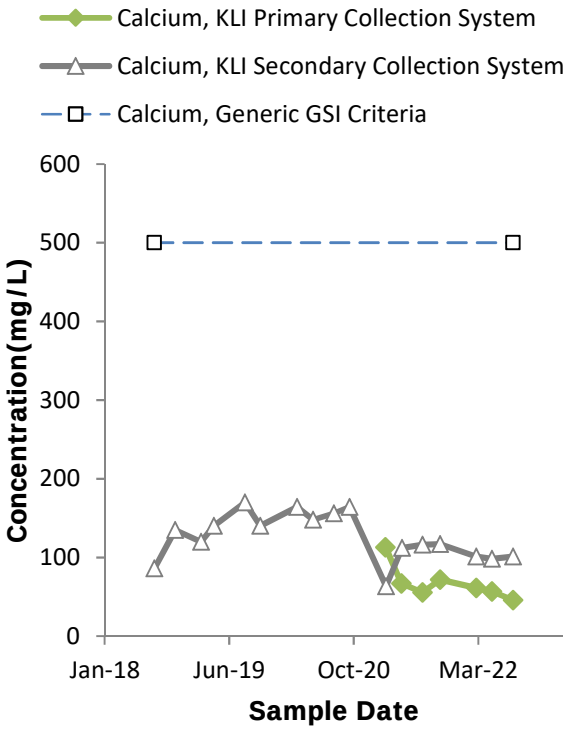


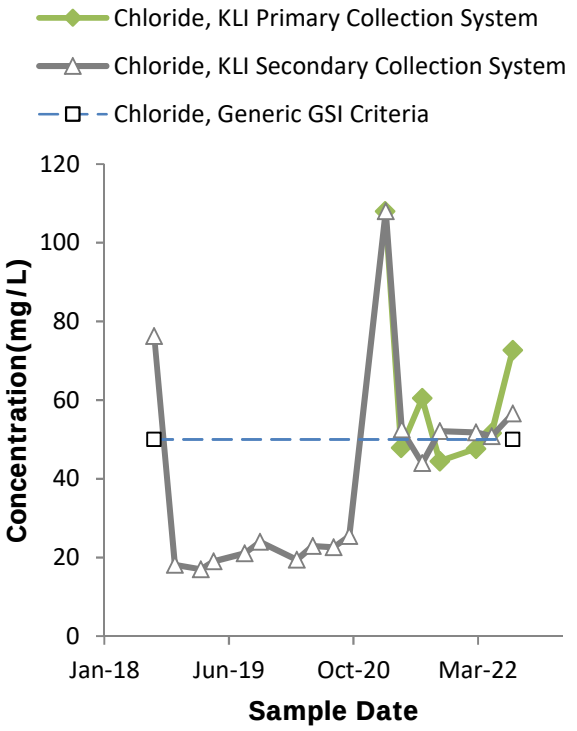


Water Quality Time Series

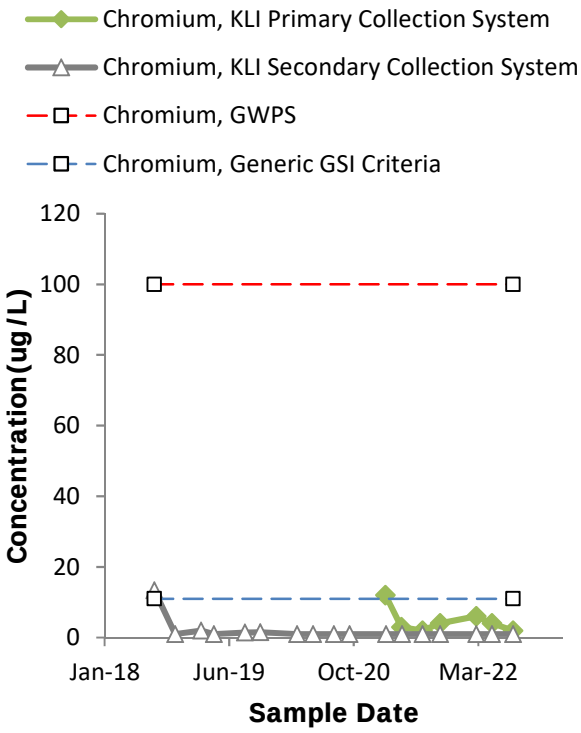


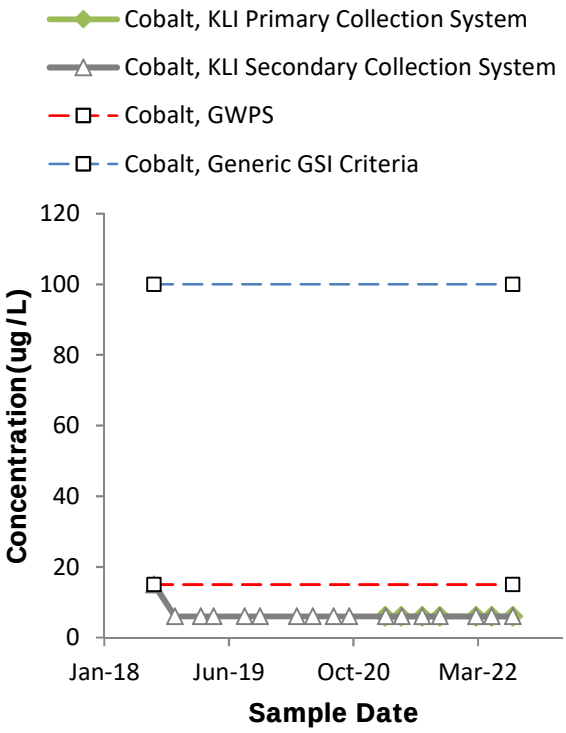


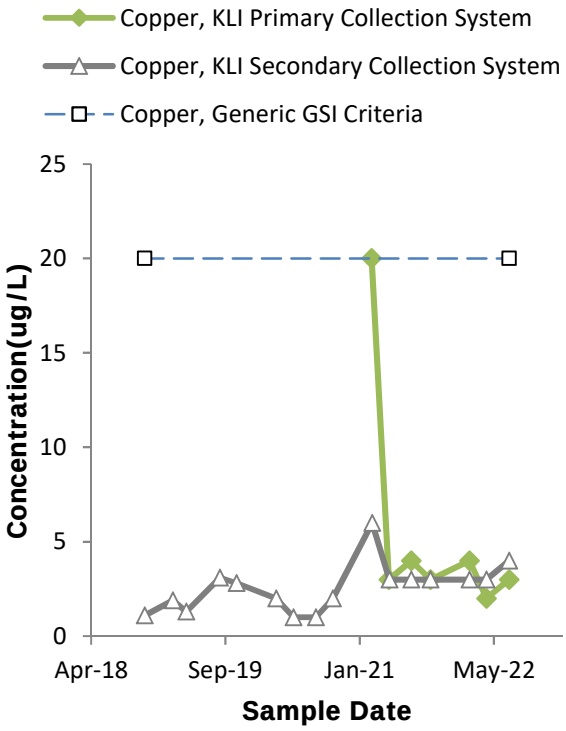


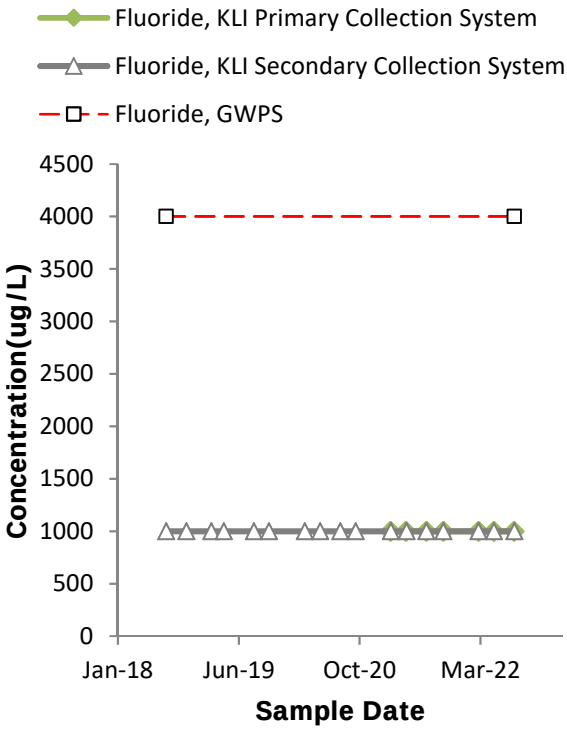


Water Quality Time Series

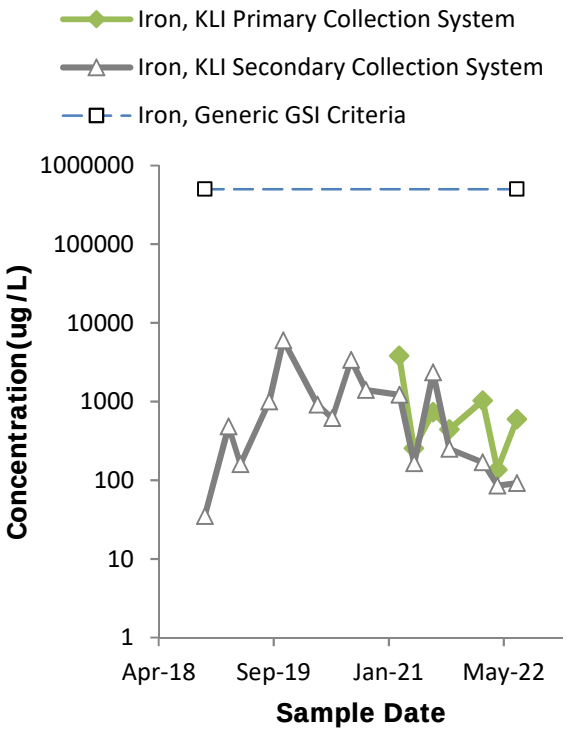


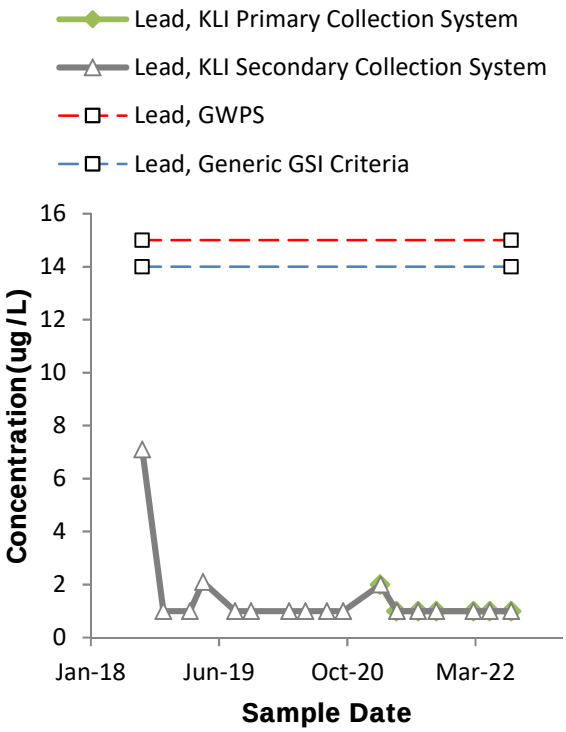


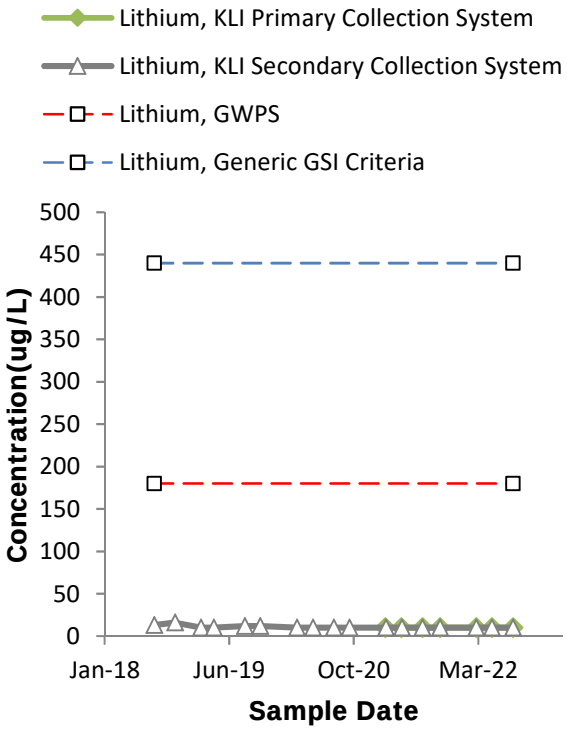


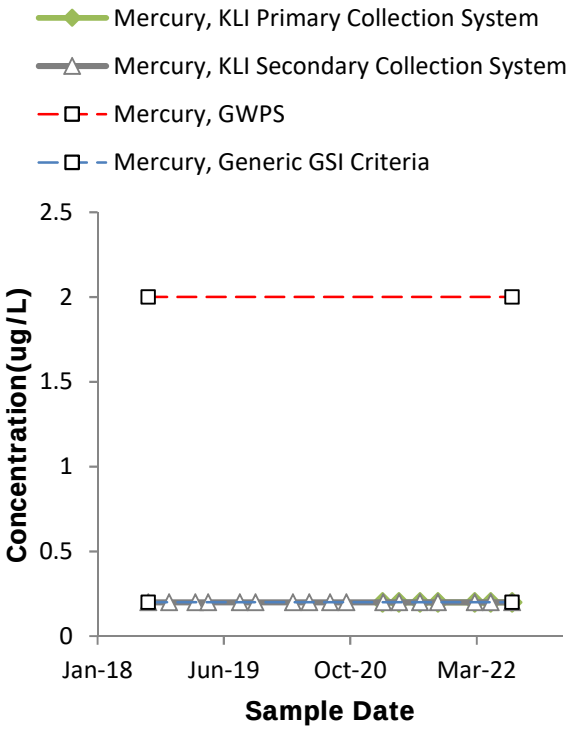


Water Quality Time Series

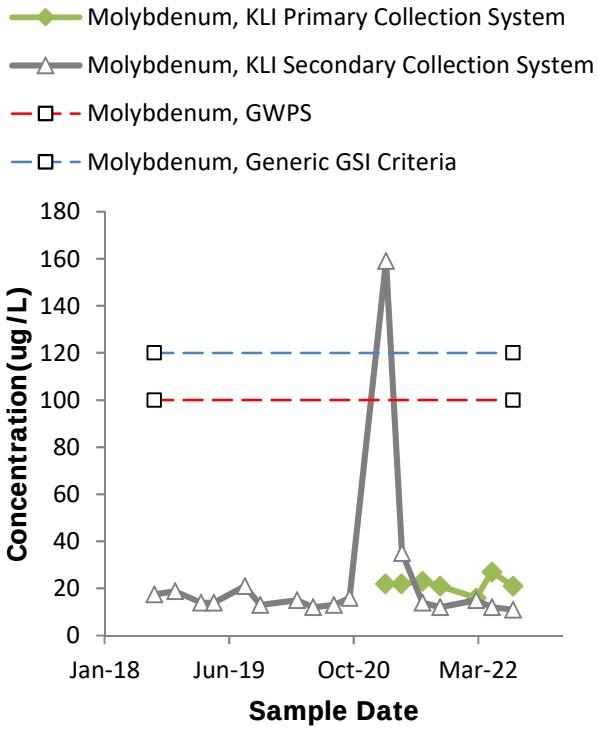


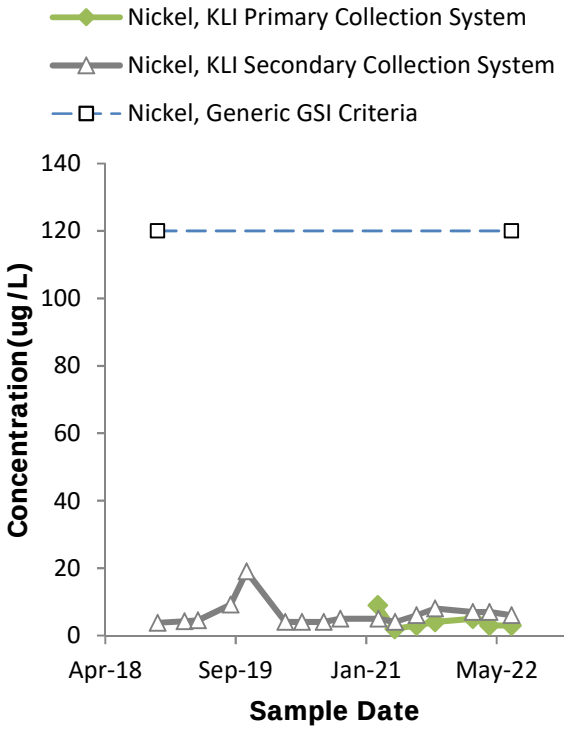


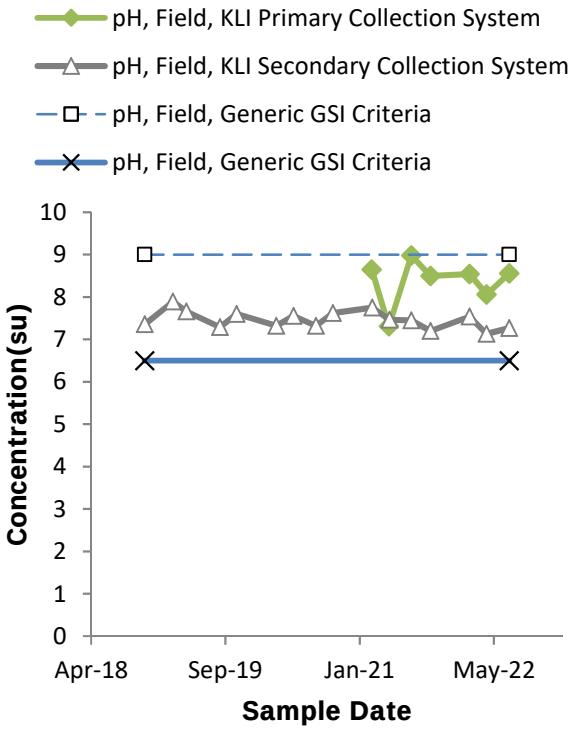


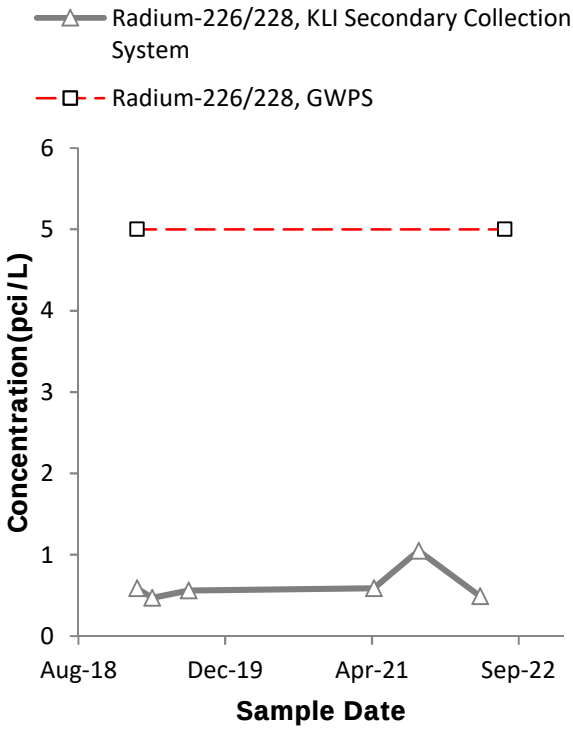


Water Quality Time Series









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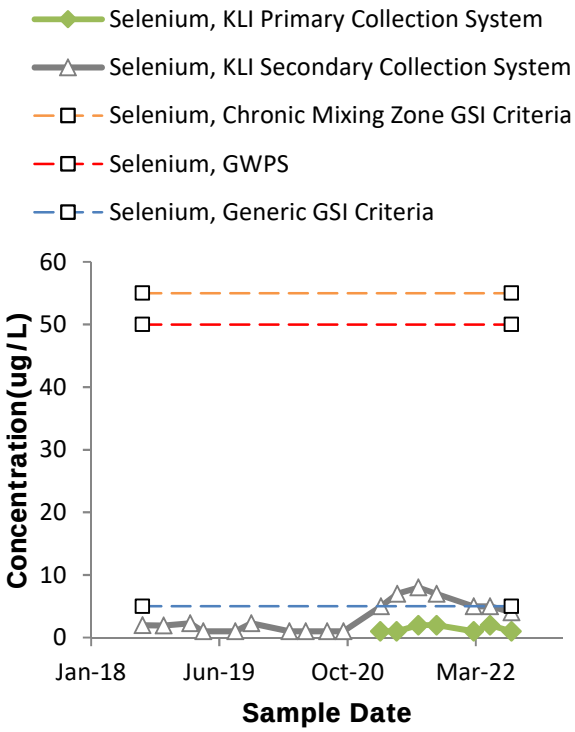

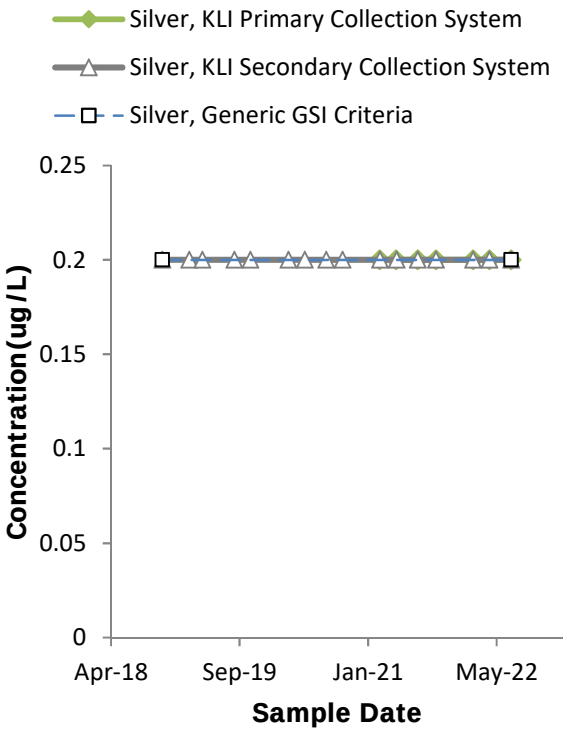

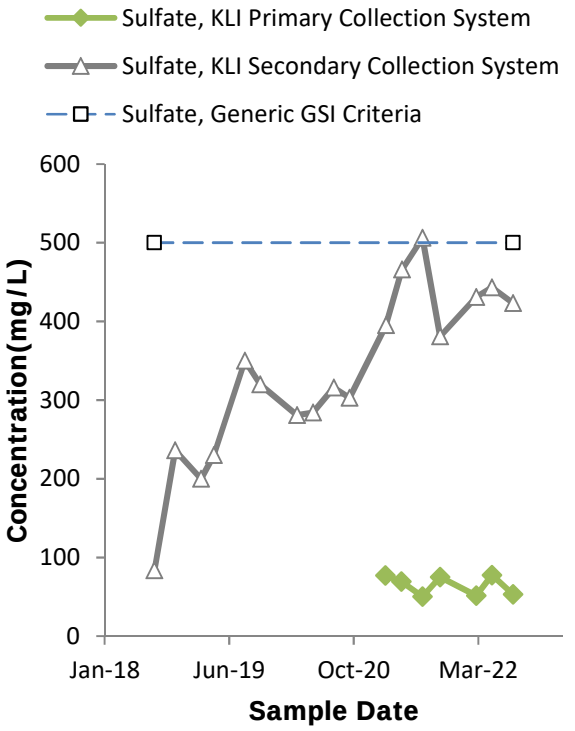

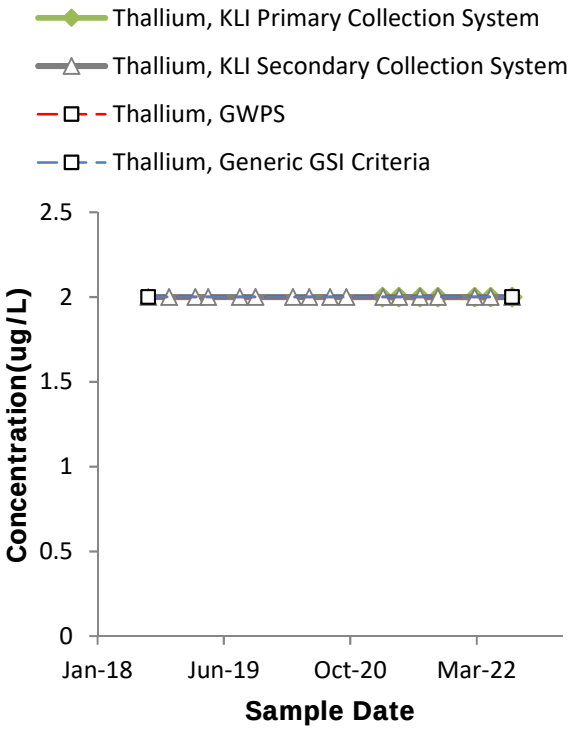

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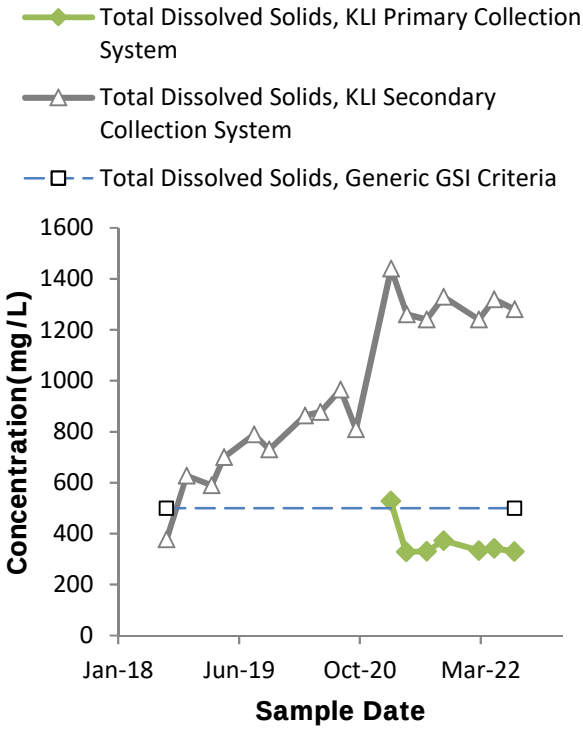
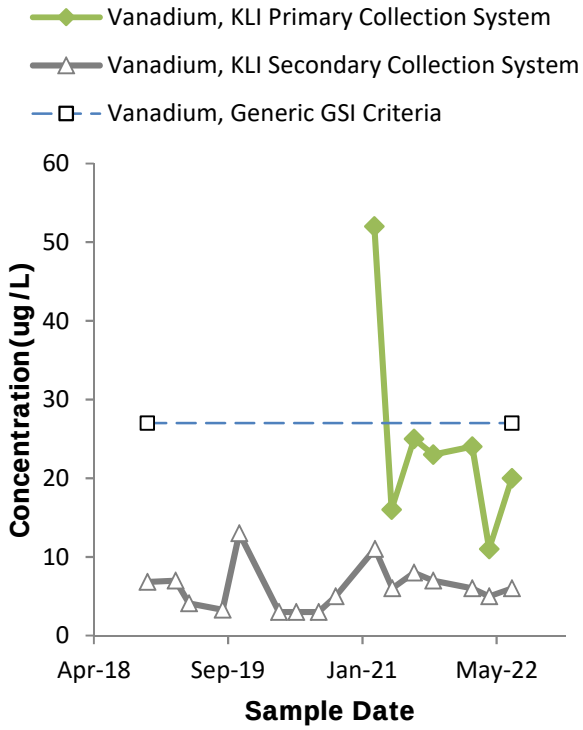
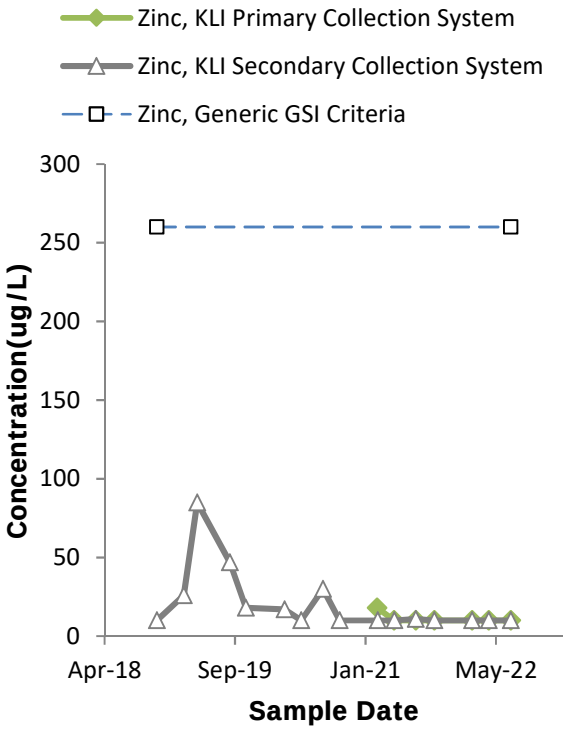
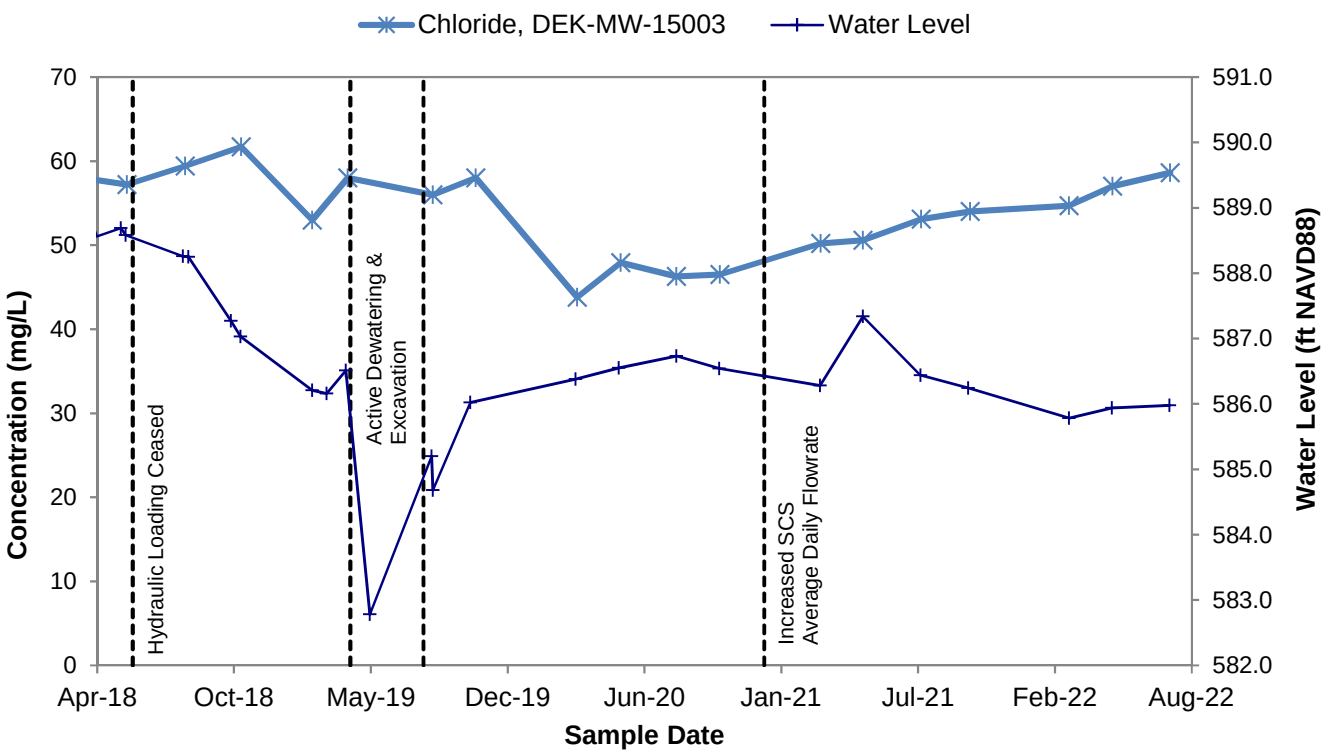






Appendix F
Alternate Source Demonstration

Alternate Source Demonstration Time Series



Fourth Quarter 2022 Hydrogeological Monitoring Report

DE Karn Lined Impoundment CCR Unit

Essexville, Michigan

January 2023

Prepared For:

Consumers Energy
1945 W. Parnall Road
Jackson, MI 49201

Prepared By:

TRC
1540 Eisenhower Place
Ann Arbor, Michigan 48108

Darby Litz
Project Manager/Hydrogeologist

Kristin Lowery, E.I.T.
Project Engineer

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FIGURES

APPENDICES

1.0 Introduction

Pursuant to the Federal CCR Rule[1], Consumers Energy initiated a detection monitoring program for the Karn Lined Impoundment that went into service on June 7, 2018. After Consumers Energy established the groundwater monitoring system and detection monitoring program pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) on December 28, 2018 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 amendments to the solid waste statute amended state groundwater monitoring requirements for coal ash impoundments; therefore, Consumers Energy submitted the *Karn Lined Impoundment Hydrogeological Monitoring Plan* (HMP) 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 November 13, 2020 and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9629 issued on December 10, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This Fourth Quarter 2022 Karn Lined Impoundment Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring requirements during the active life of the coal ash impoundment. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, *Format for Solid Waste Disposal Facility Monitoring Submittals*, dated July 5, 2013. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the facility's approved HMP that was approved by the EGLE on November 13, 2020. This HMP is compliant with the requirements set forth in Public Act No. 640 of 2018 (PA 640) to amend the Natural Resources and Environmental Protection Act (NREPA), also known as Part 115 of PA 451 of 1994, as amended (Part 115) (a.k.a., Michigan Part 115 Solid Waste Management).

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the fourth quarter 2022 at the Karn Lined Impoundment located at 2742 Weadock Highway in Essexville, Michigan (Figure 1). Groundwater in the vicinity of the Karn Lined Impoundment has been documented to be affected by the management of CCR prior to the construction of the unit (January 2019, TRC). Given that the constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, the compliance monitoring program for the Karn Lined Impoundment consists of two parts to evaluate if there are new releases from the unit:

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

1. Monitoring of secondary collection system flow rates and water quality to detect leaks in the liner; and
2. Groundwater monitoring to determine if there are potential new releases from the Karn Lined Impoundment.

Based on sampling results for the fourth quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP.

1.3 Site Overview

The Karn Lined Impoundment is located within the DE Karn Power Plant site (Site) located north of the former JC Weadock Power Plant, east of the Saginaw River, south and west of Saginaw Bay (Figure 1). Two coal-fired power generating units (Karn Units 1 & 2) began generating electricity in 1958 and 1959, respectively. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled. Two other areas of coal ash management within the Karn site are the former Karn Bottom Ash Pond that was closed by removal and the Karn Landfill that was certified closed and now in post-closure care.

1.4 Geology/Hydrogeology

The majority of the Karn Lined Impoundment area is comprised of surficial CCR and sand fill, as described in the HMP. USGS topographic maps and aerial photographs dating back to 1938, in addition to field descriptions of subsurface soil at the Site, indicate that the site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

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

The Site is bound by several surface water features (Figures 1 and 2): the Saginaw River to the west, Saginaw Bay (Lake Huron) to the north and east, and a discharge channel to the south. In general, shallow groundwater is encountered at a similar or slightly higher elevation relative to the surrounding surface water features. Groundwater flow in the upper aquifer is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay. In the vicinity of the Karn Lined Impoundment, the shallow groundwater flow is generally radial, with a potentiometric high point near the unlined ditch north of the Karn Lined Impoundment and near DEK-MW-15003, flowing outward toward the surrounding surface water bodies.

2.0 Second Collection System Monitoring

Consumers Energy initiated secondary collection system flow monitoring to comply with the EGLE-approved HMP in December 2020. The SCS serves as a leak detection system and the SCS flow rate data is used to demonstrate compliance with Part 115. Consumers Energy continues to comply with the requirements for unmonitorable units under Rule 437 of the Part 115 Rules.

Increased average daily flow rates noted for the period from December 10, 2020 – January 6, 2021 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. Following repairs to the liner in 2021, the daily average flow rates were reduced, and the three-month average dropped below the response action flow rate of 25 gallons per acre per day (GPAD). The average daily flow rate for October through December 2022 (three-month average) was calculated as 12.6 GPAD and continues to demonstrate that the daily average flow rate is below the threshold value of the response action flow rate of 25 GPAD. Trend evaluations for weekly and monthly average flow rates continue to support that no additional engineering or operational modifications are necessary, and Consumers continues to document this information in their operating record.

In response to the prior exceedance of the SCS Response Action Flow Rate, samples were collected from the surface water of the primary collection system (KLI-PCS) and from the secondary leachate collection system sump (KLI-SCS) in October 2022 to compare leachate chemistry to groundwater chemistry. The samples were analyzed for the following constituents:

- Primary Indicator Parameters: Section 11511a(3)(c) - Detection Monitoring Constituents
- Alternative Indicator Parameters: Section 11519b(2) - Assessment Monitoring Constituents
- Optional Analyses in support of Piper or Stiff diagrams

The KLI-PCS and KLI-SCS data were evaluated for comparison to groundwater quality and water chemistry and to also assess potential of hazard and mobility of constituents. A series of time-series plots are included in Appendix E to illustrate water quality data changes over time for the secondary collection system from the start of operation in June 2018 to present. This analysis demonstrates that each monitored constituent is generally present at concentrations less than the Groundwater Protection Standard (GWPS) established under 40 CFR 257.95(h) for the Karn Bottom Ash Pond or generic groundwater surface water interface (GSI) criteria adopted by the Department pursuant to Section 20120a, with the exception of total dissolved solids and chloride. A few notable observations:

- **Arsenic concentrations are higher in groundwater than the secondary collection system:** Arsenic was only detected in the secondary collection system at a concentration of 2 ug/L, in October 2022. In contrast, the arsenic concentration observed in OW-12, the monitoring well located closest to the damaged liner areas, is 104 ug/L, which is consistent with concentrations observed in August 2020, before the liner damage occurred. Arsenic present in groundwater does not appear to be a result of a release from the unit.
- **Vanadium is detected in the primary and secondary collection system and not in groundwater**: Vanadium was present in the primary collection system sample at 11 ug/L in

May 2022, 20 ug/L in July 2022, and 18 ug/L in October 2022, which are higher than the vanadium concentrations in the secondary collection system (5 ug/L in May 2022, 6 ug/L in July 2022, and 7 in October 2022). Vanadium was not detected in the wells nearest the observed liner damage: OW-12 (<2 ug/L) or DEK-MW-18001 (<2 ug/L) providing additional evidence that a release has not adversely affected groundwater conditions.

- **Secondary Collection System chemistry has not appreciably changed:** The time series plots in Appendix E show relatively stable trends in chemistry for samples collected from the primary and secondary collection systems, except for total dissolved solids (TDS) and sulfate in the secondary collection system and chloride in both the primary and secondary collection systems. TDS and sulfate concentrations in the primary collection system leachate is significantly lower in concentration than the concentration in the secondary collection system leachate, suggesting that the elevated TDS and sulfate is not likely from the primary collection system leachate. The TDS and sulfate concentrations in the secondary collection system are beginning to stabilize and are also more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products.

Water quality data collected for fourth quarter 2022 are included in the attached laboratory reports (Appendix A). Groundwater chemistry is discussed in Section 4.1. Groundwater conditions will continue to be monitored.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

In accordance with §257.91, Consumers Energy developed a groundwater monitoring system for the Karn Lined Impoundment prior to the initial receipt of waste in the CCR unit (TRC, 2018c). Given the radial groundwater flow direction and that constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the Karn Bottom Ash Pond, the groundwater monitoring system design incorporates an intrawell statistical approach for detection monitoring as described in the HMP and in accordance with the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance" (USEPA, 2009). Five monitoring wells that are screened in the uppermost saturated unit were selected for the Karn Lined Impoundment HMP detection monitoring (DEK-MW-15003, DEK-MW-18001, OW-10, OW-11, and OW-12). Monitoring well locations are shown on Figure 2.

3.2 October 2022 Detection Monitoring Event

In accordance with the HMP, TRC conducted the fourth quarter 2022 monitoring event for the Karn Lined Impoundment on October 3rd and 4th, 2022. In addition to the routine groundwater samples collected from the monitoring well network, a water sample was collected from a sump in the secondary collection system (KLI-SCS) and a surface water sample was collected from the primary collection system (KLI-PCS), as discussed in Section 2 above, such that leachate chemistry could be compared to groundwater chemistry. A sample of surface water was also collected from a ditch located north of the lined impoundment (SW-Ditch) to further evaluate site geochemistry (Figure 2). The SW-Ditch surface water grab sample represents water quality from the potentiometric high point adjacent to the Karn Lined Impoundment.

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	Section 11519b(2) – Assessment Monitoring Constituents		
Boron	Antimony	Fluoride	Thallium
Calcium	Arsenic	Lead	Vanadium
Chloride	Barium	Lithium	Zinc
Fluoride	Beryllium	Mercury	
Iron	Cadmium	Molybdenum	Radium 226/228
pH	Chromium, total	Nickel	
Sulfate	Cobalt	Selenium	
Total Dissolved Solids (TDS)	Copper	Silver	

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, and bicarbonate, carbonate, and total alkalinity to provide further evaluation of groundwater chemistry. Analytical results from the fourth quarter 2022 monitoring event are included in the attached laboratory reports (Appendix A).

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

Monitoring wells were purged with peristaltic pumps utilizing low-flow sampling methodology. Field parameters were stabilized at each monitoring well prior to collecting groundwater samples. Stabilized field parameters for each monitoring well are summarized in Table 2. Field notes are included as Appendix B. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Porewater sample preparation and analyses were performed in accordance with SW-846 "Test Methods for Evaluation Solid Waste – Chemical / Physical Methods," USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of one field blank, one equipment blank, one field duplicate (OW-12), and field matrix spike/matrix spike duplicate samples collected at DEK-MW-18001.

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the HMP program. The data quality reviews for the Karn Lined Impoundment network wells are summarized in Appendix C.

3.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the fourth quarter 2022 groundwater monitoring event are provided in Table 1. The data were used to construct the groundwater contour map (Figure 3).

Groundwater elevations measured at the site in October 2022 are generally within the range of 579 to 586 feet above mean sea level (ft NAVD88) and groundwater is typically encountered at equal elevation relative to the surrounding surface water features measured by the NOAA gauging station data or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although the point source discharge of sluiced bottom ash into the former Karn Bottom Ash Pond historically created localized mounding of the potentiometric surface, the new Karn Lined Impoundment went into service on June 7, 2018 and has been continuously collecting the process water and bottom ash that went into the former bottom ash pond. Since the former bottom ash pond is no longer being hydraulically loaded with sluiced ash and has been dewatered by gravity, the characteristic groundwater mound centered within the former surface pool area is no longer present. The groundwater elevation data collected in the vicinity of the former Karn Bottom Ash Pond in October 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to measurement taken in June 2018. Groundwater at the Site is locally influenced by incidental infiltration from precipitation over the uncovered acreage and the unlined low volume miscellaneous wastewater conveyance associated with the permitted NPDES discharge system, which is located just north of the Karn Lined Impoundment. Monitoring wells OW-11, OW-12, and DEK-MW-15003 delineate the newly established groundwater elevation high point that was previously centered over the former Karn Bottom Ash Pond with porewater flow generally flowing radially towards the adjacent surface water features from this newly established potentiometric “high”, as illustrated in Figure 3.

The average hydraulic gradient observed on October 3, 2022 in the vicinity of the former Karn Bottom Ash Pond and Karn Lined Impoundment is estimated at 0.0048 ft/ft. The gradients were calculated using the monitoring well pairs DEK-MW-15004/DEK-MW-15005, DEK-MW-15003/DEK-MW-15006, and OW-11/MW-08, as well as the monitoring well water elevation difference and distance between DEK-MW-18001 and the discharge channel. The discharge channel surface water elevation was taken from the NOAA gauging station data on the same date as the water level measurements. Using the mean hydraulic conductivity of 15 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.3, the estimated average seepage velocity was calculated to be 0.24 ft/day or 88 ft/year in October 2022 which is reduced relative to previous estimated seepage velocities (e.g., 0.33 ft/day or 120 ft/year August 2018).

Due to the operational changes of the former bottom ash pond and the completion of the landfill capping activities in 2020, the gradient between the area of the Karn Bottom Ash Pond and Karn Lined Impoundment and the surrounding surface water bodies is flattening out as compared to previous quarters and is also attempting to reach a new equilibrium, as expected. The general flow direction relative to the Karn Lined Impoundment is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III/IV parameters that could potentially migrate from the Karn Lined Impoundment.

4.0 Data Evaluation

Based on sampling results for the fourth quarter 2022, the Karn Lined Impoundment remains in detection monitoring in accordance with the HMP. The following section summarizes the statistical approach applied to assess the fourth quarter 2022 groundwater data in accordance with the detection monitoring program.

Water quality data are included in the attached laboratory reports (Appendix A). Groundwater analytical data for the most recent quarterly monitoring event is summarized in Table 3 along with the associated Part 201 generic drinking water criteria and the generic GSI criteria. GSI compliance is evaluated through monitoring performed at the Karn Landfill in accordance with the EGLE-approved Consumers Energy's revised Karn Landfill HMP (Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area) dated December 19, 2017 and in accordance with the December 23, 2015 mixing zone determination.

4.1 Statistical Evaluation of Trends

Groundwater in the vicinity of the Karn Lined Impoundment has been affected by CCR management before commencement of operation (January 2019, TRC). Given that the constituents associated with CCR currently managed in the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, intrawell trend tests, in conjunction with KLI-SCS flow rates, will be utilized to assess whether a release has occurred from operation of the unit. The detection monitoring constituent concentrations will be analyzed using Mann-Kendall and Sen's Slope trend tests to determine if there is an upward trend that may indicate a release from the Karn Lined Impoundment. The data will be analyzed in the context of the Site hydrogeologic characteristics, and an assessment made as to whether the source of an upward trend, if identified, is from a possible release from the Karn Lined Impoundment, another on-site release, or on-site migration of nearby impact (i.e., former Karn Bottom Ash Pond).

Time-series plots and statistical trend analyses are used to evaluate groundwater quality each quarter, which are included as Appendix D. Consumers Energy manages and evaluates its analytical data using Sanitas™ Statistical Software (Sanitas™). Consumers Energy conducts intra-well trend analyses to examine data for each monitoring well-constituent pair in the groundwater monitoring system over time to determine if changes in water quality are occurring that may be associated with the Karn Lined Impoundment. Data from March 2021 through October 2022 were analyzed using Mann-Kendall and Sen's Slope at a significance level (α) of 0.025 per tail for each constituent/sampling point dataset to assess trends. Sen's Slope estimator was used to assess the magnitude of the slope and the Mann-Kendall test was used to determine if the slope was statistically significant. The graphical output of the Sen's Slope/Mann-Kendall trend tests and time series are presented in Appendix D. Appendix D also includes a table summarizing these trends and the associated statistical trend charts.

Data trends for detection monitoring constituents are generally stable (i.e., no trend) or declining for the majority of the monitoring well/constituent pairs with the following exceptions:

- The increasing trend in chloride concentrations continued to be observed in DEK-MW-15003.
- The increasing trend initially observed for total dissolved solids at DEK-MW-15003 in Q3 2022 was confirmed in Q4 2022.
- The previously continuous increasing trend for boron at OW-11 in Q3 2022 was not observed in Q4 2022.
- The increasing trend for pH continued to be observed in OW-11.

4.2 Detection Monitoring Data Discussion

Groundwater quality is generally consistent with previous monitoring events and the majority of the well/constituent pairs are exhibiting no trend or decreasing concentrations. Although increasing trends of detection monitoring (Appendix III) constituents exist, the groundwater conditions do not conclusively indicate a release from the unit, as discussed further in Section 4.3. The location of one of the identified liner damage locations was approximately 40-ft upgradient from monitoring well OW-12 and the second location was approximately 130-ft upgradient from monitoring well DEK-MW-18001. Both leaks have been repaired. Detection monitoring constituent concentrations at OW-12, located closest to the identified liner damage, exhibit no statistically significant increasing trends, indicating that if a release to groundwater occurred due to the apparent leak in the liner system, the effects on local groundwater quality at this point appear to be negligible. The increasing trends at noted in section 4.1 will continue to be evaluated within context of changes in the site operational status.

4.3 Alternate Source Demonstration

At this time, Consumers Energy is continuing to assert an Alternate Source Demonstration (ASD), for the following, as detailed in the First Quarter 2022 Hydrogeological Monitoring Report (TRC, April 2022):

- pH in monitoring well OW-11; and
- Chloride in monitoring well DEK-MW-15003.

The ASD has been updated this quarter to include:

- Total dissolved solids in monitoring well DEK-MW-15003.

Although increasing trends of detection monitoring (Appendix III) constituents exist, as noted in Section 4.1, the groundwater conditions do not conclusively indicate a release from the unit for several reasons as detailed below.

Timing of Changes in Concentrations

Time-series plots included in Appendix F illustrate that the change in chloride and TDS at DEK-MW-15003 is likely a result of changes in the groundwater flow regime or redox conditions as a result of the Bottom Ash Pond closure activities, rather than a result of a release from the unit.

- Chloride and TDS at DEK-MW-15003 initially decreased after the Bottom Ash Pond closure activities. In early 2020, chloride concentrations began to increase, followed by increases in TDS beginning in 2021. Both constituents appear to be approaching the concentrations

observed pre-construction. Chloride is one of the components of TDS. Other components of TDS, such as calcium, iron, magnesium, potassium, sodium, and sulfate have remained relatively consistent from 2020 to present and the increases in TDS are correlated with the increases in chloride. The slight increase in chloride began before the noted leak in the Karn Lined Impoundment liner system was observed; therefore, the recent increase in concentrations is not due to a release from the unit.

Groundwater Flow Direction

OW-11 and DEK-MW-15003 are not located downgradient of either area of the noted liner damage, due to the position of the wells relative to the groundwater elevation high point, as shown in Figure 3. Furthermore, OW-11 has distinct chemistry as compared to the KLI-SCS data as shown in Table 3. Boron, which can be used as a conservative tracer, is nearly five times higher in OW-11 than what has been observed in the KLI-SCS samples. The pH observed at OW-11 is 2 standard units higher than what is observed in the KLI-SCS sample and higher than other nearby wells, which indicate a source other than the Karn Lined Impoundment is influencing chemistry at OW-11.

Leachate Chemistry

Analysis of the KLI-PCS and KLI-SCS data provide additional lines of evidence to support a source other than the unit is contributing to groundwater conditions.

- Arsenic concentrations are higher in groundwater than in the secondary collection system; therefore, arsenic present in groundwater does not appear to be a result of a release from the unit (Section 2.0).
- Vanadium is detected in the primary and secondary collection system and not in groundwater in the wells nearest the observed liner damage OW-12 or DEK-MW-18001 (<2 ug/L), providing additional evidence that a release has not adversely affected groundwater conditions.

5.0 Conclusions and Recommendations

Consumers Energy will continue the detection monitoring program for the Karn Lined Impoundment unit based on the data evaluations completed in Section 4.0 of this report in conformance with the Karn Lined Impoundment HMP. Although increasing trends for detection monitoring constituents were observed in two wells in fourth quarter 2022, these trends were found to not be a result of operation of the Karn Lined Impoundment. No SSIs over background limits were identified at the Karn Lined Impoundment during the October 2022 monitoring event. The use of secondary collection system flow rates as a leak detection system was successful. Increased flow rates observed in fourth quarter 2020 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. The results of the mitigation efforts continue to be monitored and recent data demonstrate that the daily average flow rate has been reduced to less than the threshold value of the Response Flow Rate of 25 gallons per acre per day after the documented repairs and response activities were completed in 2021. The first quarter monitoring event is scheduled for March 2023.

6.0 References

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TRC. January 2019. 2018 Annual Groundwater Report for the DE Karn Power Plant Bottom Ash Pond CCR Unit, Essexville, Michigan. Prepared for Consumers Energy Company.

TRC. November 2020. Karn Lined Impoundment Hydrogeological Monitoring Plan for the DE Karn Power Plant Lined Impoundment, Essexville, Michigan. Prepared for Consumers Energy Company.

TRC. April 2022. First Quarter 2022 Hydrogeological Monitoring Report for the DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. Prepared for Consumers Energy Company.

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

USEPA. April 2015. 40 CFR Parts 257 and 261. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. 80 Federal Register 74 (April 17, 2015), pp. 21301-21501 (80 FR 21301).

USEPA. July 2018. 40 CFR Part 257. Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One); Final Rule. 83 Federal Register 146 (July 30, 2018), pp. 36435-36456 (83 FR 36435).

Tables

Table 1
Summary of Groundwater Elevation Data
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)	October 3, 2022	
				Depth to Water (ft BTOC)	Groundwater Elevation (ft)
DEK Bottom Ash Pond					
DEK-MW-15002	590.87	Sand	578.3 to 575.3	7.00	583.87
DEK-MW-15005	589.72	Sand	572.3 to 567.3	9.68	580.04
DEK-MW-15006	589.24	Sand	573.0 to 568.0	9.30	579.94
DEK Bottom Ash Pond & Karn Lined Impoundment					
DEK-MW-18001	593.47	Sand	579.2 to 574.2	8.98	584.49
Karn Lined Impoundment					
DEK-MW-15003	602.74	Sand	578.8 to 574.8	17.00	585.74
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	7.18	584.40
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	22.28	585.62
OW-12	603.10	Silty Sand	584.2 to 579.2	17.35	585.75
DEK Nature and Extent					
DEK-MW-15004	611.04	Sand	576.6 to 571.6	28.45	582.59
MW-01	597.02	Sand	573.0 to 570.0	17.05	579.97
MW-03	597.30	Sand	569.8 to 566.8	17.35	579.95
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	9.34	580.10
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	17.91	580.87
MW-10	596.97	Sand	582.5 to 572.5	15.98	580.99
MW-12	598.60	Sand	583.9 to 573.9	18.33	580.27
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	14.25	580.12
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	15.75	580.05
MW-22	598.99	Ash/Sand	571.4 to 568.4	17.05	581.94
MW-23	595.57	Ash/Sand	576.9 to 571.9	14.05	581.52
DEK Static Water Level					
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	17.34	580.00
MW-04	598.01	NR	569.5 to 564.5	18.04	579.97
MW-17	597.91	Sand	577.0 to 574.0	13.48	584.43
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	26.10	583.12
MW-19	597.28	NR	572.1 to 567.1	16.94	580.34
MW-20	632.75	Sand	582.3 to 579.3	52.66	580.09
MW-21	632.91	Sand	587.1 to 584.1	51.35	581.56
OW-01	631.33	NR	572.5 to 567.5	51.30	580.03
OW-02	598.01	Fly Ash	579.4 to 576.4	15.93	582.08
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	17.15	580.79
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	10.05	580.16
OW-05	593.53	Sand	576.9 to 571.9	13.08	580.45
OW-06	603.95	NR	580.9 to 575.9	22.06	581.89
OW-07	596.41	Ash	583.3 to 580.3	15.03	581.38
OW-08	593.93	NR	581.0 to 576.0	11.55	582.38
OW-09	593.45	NR	585.5 to 580.5	10.68	582.77
OW-13	588.52	NR	579.5 to 574.5	4.65	583.87
OW-15	587.75	NR	572.8 to 567.8	4.69	583.06

Notes:

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

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

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

NR: Not Recorded

Table 2
Summary of Field Parameters
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
Karn Lined Impoundment							
DEK-MW-15003	10/4/2022	0.24	-231.3	8.3	441	22.5	2.5
DEK-MW-18001	10/4/2022	1.00	-133.4	7.6	811	15.1	1.2
KLI-PCS	10/4/2022	7.51	42.7	7.9	667	18.5	19.6
KLI-SCS	10/4/2022	4.58	20.2	7.5	1,785	20.3	0.0
OW-10	10/4/2022	0.12	-226.9	7.1	838	15.8	9.1
OW-11	10/4/2022	1.60	-45.1	9.6	375	13.7	6.9
OW-12	10/4/2022	0.10	-189.5	7.2	757	17.2	2.6
SW-DITCH	10/4/2022	8.56	18.1	8.6	650	19.7	17.8

Notes:
mg/L - Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit.
-- = Parameter Not Measured

Table 3
Summary of Groundwater Sampling Results (Analytical)
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	DEK-MW-15003	DEK-MW-18001	OW-10	OW-11	OW-12	KLI-PCS	KLI-SCS	SW-DITCH
					Sample Date:	10/4/2022	10/4/2022	10/4/2022	10/4/2022	10/4/2022	10/4/2022	10/4/2022	10/4/2022
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Upgradient	Downgradient		Upgradient	Downgradient	Supplemental		
Appendix III[(1)]													
Boron	ug/L	NC	**500**	**500**	4,000	**891**	**1,060**	**1,100**	**3,470**	**1,090**	410	**735**	146
Calcium	mg/L	NC	NC	NC	500[EE]	26.1	58.3	118	7.13	70.7	65.8	95.7	52.8
Chloride	mg/L	250**	250[E]	250[E]	**50**	**60.8**	**62.5**	**66**	**62.5**	**61.8**	**80.5**	**71**	**83.7**
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	3,460	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	**250****	**250[E]**	**250[E]**	500[EE]	39	140	46.4	19.3	150	64.1	**427**	36.5
Total Dissolved Solids	mg/L	**500****	**500[E]**	**500[E]**	**500**	317	**551**	**612**	260	**531**	421	**1,300**	404
pH, Field	SU	**6.5 - 8.5****	**6.5 - 8.5[E]**	**6.5 - 8.5[E]**	**6.5 - 9.0**	8.3	7.6	7.1	**9.6**	7.2	7.9	7.5	**8.6**
Appendix IV[(1)]													
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	2	< 1	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	**401**	**109**	3	**667**	**104**	3	2	3
Barium	ug/L	2,000	2,000	2,000	1,200	44	135	157	28	80	391	68	234
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	1	< 1	< 1	3	1	2
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	3,460	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	23	23	31	< 10	34	< 10	< 10	< 10
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	**73**	210	**120**	25	< 5	< 5	**178**	21	15	14	< 5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.207	0.264	< 0.141	< 0.158	0.137	--	--	--
Radium-228	pCi/L	NC	NC	NC	NC	2.13	1.67	1.84	1.27	1.78	--	--	--
Radium-226/228	pCi/L	5	NC	NC	NC	2.15	1.93	1.96	1.35	1.91	--	--	--
Selenium	ug/L	50	50	50	**5.0**	< 1	< 1	**10**	4	2	2	4	3
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Additional MI Part 115[(2)]													
Iron	ug/L	**300****	**300[E]**	**300[E]**	500,000[EE]	84	**894**	**1,350**	128	**5,800**	**542**	149	**591**
Copper	ug/L	1,000**	1,000[E]	1,000[E]	20	< 1	< 1	1	1	< 1	3	3	5
Nickel	ug/L	NC	100	100	120	< 2	2	3	2	3	4	5	4
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	**4.5**	**62**	**27**	< 2	< 2	**5**	**693**	< 2	**18**	**7**	**8**
Zinc	ug/L	5,000**	2,400	5,000[E]	260	< 10	< 10	< 10	181	< 10	< 10	< 10	< 10

Notes:

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

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

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

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.

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

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

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

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

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

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

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

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

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Table 4
Summary of Statistical Exceedances – October 2022
DE Karn Lined Impoundment – Hydrogeological Monitoring Program
Essexville, Michigan

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

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

Facility: Karn Lined Impoundment – WDS# 392503

Well #	Location	Parameter	Part 201 GRCC	Statistical Limit (or 'CC' for Control Charts)	4 Qtr. 2022 (**bold** >201)	3 Qtr. 2022 (**bold** >201)	2 Qtr. 2022 (**bold** >201)	1 Qtr. 2022 (**bold** >201)

No Exceedances

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
DE KARN AND JC WEADOCK POWER PLANTS
ESSEXVILLE, MICHIGAN

TITLE:

SITE LOCATION MAP

DRAWN BY:	B. TRACY
CHECKED BY:	J. KRENZ
APPROVED BY:	D. LITZ
DATE:	JANUARY 2023
PROJ. NO.:	464095.0001
FILE:	464095-103-001.mxd

FIGURE 1

S:\1-PROJECTS\Consumers_Energy_Company\Michigan\CCR_GW\2017_269767\1_DEKARN\2022_MXDs\Q4_2022_DECEMBER\464095-103-001.mxd -- Saved By: BTRACY on 12/20/2022, 14:26:31 PM

LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- PRIMARY CONTAINMENT SYSTEM SAMPLE (KLI-PCS)
- SURFACE WATER SAMPLE (SW-DITCH)
- SECONDARY CONTAINMENT SUMP (KLI-SCS)
- SLURRY WALL (APPROXIMATE)
- EXTENT OF GEOSYNTHETICS

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02, MW-03/MW-04, OW-02/MW-22, AND OW-07/MW-23 AS THE WELLS ARE LOCATED WITHIN 15-FT OF EACH OTHER.

N

0 600 1,200 Feet

1 " = 600 '

1:7,200

PROJECT:

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

TITLE:

SITE LAYOUT MAP

DRAWN BY:	B. TRACY	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 2**
DATE:	JANUARY 2023		

TRC
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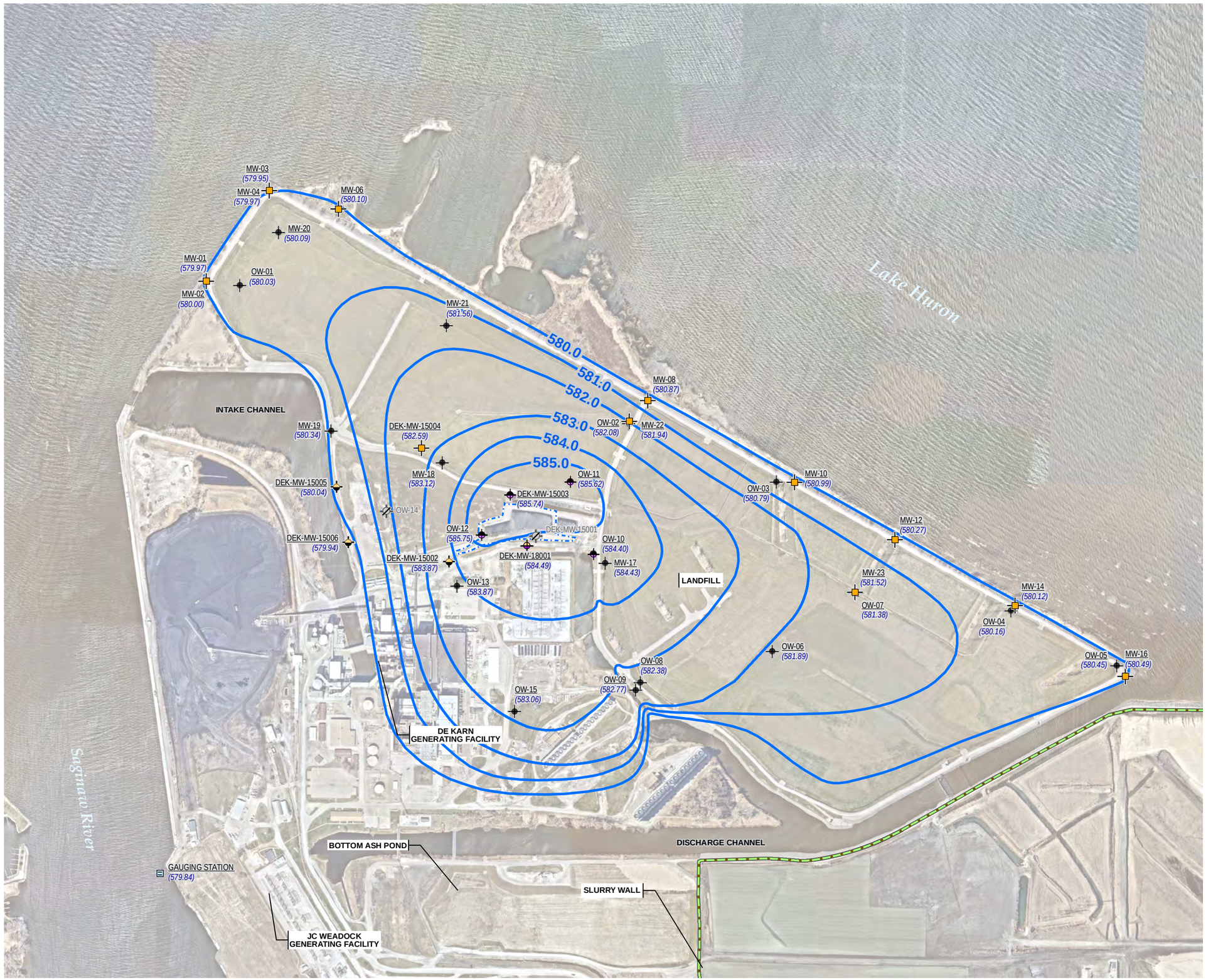
FILE NO.: 464095-103-002a.mxd

Plot Date: 1/19/2023, 14:23:50 PM by BTRACY -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 26976\1 DEKARN\2022 MXDs\04 2022 DECEMBER\464095-103-002a.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS



LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED WELL
- JCW BEDROCK MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- SURFACE WATER GAUGING STATION
- NATURE AND EXTENT WELL
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)
- GROUNDWATER ELEVATION CONTOUR
- (580.50) GROUNDWATER ELEVATION (FEET)
- (NU) NOT USED

NOTES

1. BASE MAP IMAGERY FROM NEARMAP, (5/4/2022).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

0 600 1,200 Feet

1 " = 600 '
1:7,200

PROJECT:
CONSUMERS ENERGY COMPANY
DE KARN POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE:
SHALLOW GROUNDWATER CONTOUR MAP OCTOBER 2022

DRAWN BY:	A. ADAIR	PROJ NO.:	464095.0001
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 3**
DATE:	JANUARY 2023		

TRC
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Phone: 734.971.7080
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FILE NO.: 464095-103-003.mxd

Plot Date: 1/19/2023, 14:39:54 PM by BTRACY -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\Consumers Energy Company\Michigan\CCR GW\2017 269767\1 DEKARN\2022 MXDs\Q4 2022 DECEMBER\464095-103-003.mxd
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl (Foot)
Map Rotation: 0
TRC - GIS

Appendix A
Laboratory Analytical Reports

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: October 24, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN LINED IMPOUNDMENT – 2022 Q4

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-1018

TRC Environmental, Inc. conducted groundwater monitoring at the DE Karn Lined Impoundment area on 10/04/2022 for the 4th Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 10/05/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted in 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: Karn/Weadock Complex
Work Order ID: Q4-2022 DEK Lined Impoundment
Date Received: 10/5/2022
Chemistry Project: 22-1018

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-1018-01	DEK-MW-15003	Groundwater	10/04/2022 01:36 PM	DEK Lined Impoundment
22-1018-02	OW-10	Groundwater	10/04/2022 12:10 PM	DEK Lined Impoundment
22-1018-03	OW-11	Groundwater	10/04/2022 01:50 PM	DEK Lined Impoundment
22-1018-04	OW-12	Groundwater	10/04/2022 10:55 AM	DEK Lined Impoundment
22-1018-05	KLI-SCS	Groundwater	10/04/2022 09:45 AM	DEK Lined Impoundment
22-1018-06	KLI-PCS	Surface Water	10/04/2022 09:15 AM	DEK Lined Impoundment
22-1018-07	SW-DITCH	Surface Water	10/04/2022 08:40 AM	DEK Lined Impoundment
22-1018-08	DUP-KLI	Groundwater	10/04/2022 12:00 AM	DEK Lined Impoundment
22-1018-09	EB-KLI	Water	10/04/2022 03:37 PM	DEK Lined Impoundment
22-1018-10	FB-KLI	Water	10/04/2022 01:36 PM	DEK Lined Impoundment

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-1018-01
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 01:36 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-01-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-01-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	401		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	44		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	891		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	26100		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	84		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	23		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	4220		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	52		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	25		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	4080		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	50500		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	60800		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 22-1018-01
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 01:36 PM

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

Aliquot #: 22-1018-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	39000		ug/L	1000.0	10/05/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2280		ug/L	25.0	10/13/2022	AB22-1013-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-01-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	317		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	84800		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	84800		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	290		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3800		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4700		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-1018-02
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 12:10 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-02-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-02-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	3		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	157		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	1100		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	118000		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	1		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	1		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	1350		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	31		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	17500		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	185		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	3		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	7480		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	10		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	62700		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	5		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	66000		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 22-1018-02
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 12:10 PM

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

Aliquot #: 22-1018-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	46400		ug/L	1000.0	10/05/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-02-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	4620		ug/L	25.0	10/13/2022	AB22-1013-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-02-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	612		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	379000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	379000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	370		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	8100		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	8700		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-1018-03
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 01:50 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-03-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-03-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	2		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	667		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	28		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	3470		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	7130		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	1		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	128		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	178		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	2		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	3810		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	4		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	62500		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	693		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	181		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	62500		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-11**
Lab Sample ID: 22-1018-03
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 01:50 PM

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

Aliquot #: 22-1018-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	3460		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	19300		ug/L	1000.0	10/05/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-03-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	12600		ug/L	25.0	10/13/2022	AB22-1013-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-03-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	260		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	74200		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	37900		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	36400		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	7000		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	14000		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-1018-04
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 10:55 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-04-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-04-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	104		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	80		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	1090		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	70700		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	5800		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	34		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	23900		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	163		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	21		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	3		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	5620		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	2		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	60100		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-04-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	61800		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-12**
Lab Sample ID: 22-1018-04
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 10:55 AM

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

Aliquot #: 22-1018-04-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	150000		ug/L	1000.0	10/10/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-04-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	812		ug/L	25.0	10/13/2022	AB22-1013-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-04-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	531		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-04-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	188000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	188000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-04-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-04-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2500		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-04-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	3500		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-1018-05
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 09:45 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-05-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-05-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	2		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	68		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	735		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	95700		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	1		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	3		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	149		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	32700		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	6		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	14		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	5		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	3720		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	4		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	314000		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	7		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-05-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1310		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	71000		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-SCS**
Lab Sample ID: 22-1018-05
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 09:45 AM

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

Aliquot #: 22-1018-05-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	427000		ug/L	1000.0	10/10/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-05-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	10/13/2022	AB22-1013-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-05-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1300		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-05-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	556000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	556000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-05-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-05-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2600		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-05-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4200		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-1018-06
Matrix: Surface Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 09:15 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-06-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-06-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	3		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	391		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	410		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	65800		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	3		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	3		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	542		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	17000		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	15		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	15		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	4		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	3400		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	2		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	57000		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	18		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-06-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	799		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	80500		ug/L	1000.0	10/10/2022	AB22-1010-05

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **KLI-PCS**
Lab Sample ID: 22-1018-06
Matrix: Surface Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 09:15 AM

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

Aliquot #: 22-1018-06-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	64100		ug/L	1000.0	10/05/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-06-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	196		ug/L	25.0	10/18/2022	AB22-1018-01

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-06-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	421		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-06-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	183000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	183000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-06-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-06-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3900		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-06-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4500		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-1018-07
Matrix: Surface Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 08:40 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-07-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-07-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	3		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	234		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	146		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	52800		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	2		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	5		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	591		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	17400		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	22		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	4		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	3220		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	3		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	54600		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	8		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-07-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	1040		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	83700		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **SW-DITCH**
Lab Sample ID: 22-1018-07
Matrix: Surface Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 08:40 AM

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

Aliquot #: 22-1018-07-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	36500		ug/L	1000.0	10/05/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-07-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	190		ug/L	25.0	10/18/2022	AB22-1018-01

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-07-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	404		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-07-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	176000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	176000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-07-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-07-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	5900		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-07-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	7400		ug/L	1000.0	10/12/2022	AB22-1016-08

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-1018-08
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 12:00 AM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-08-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-08-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	109		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	83		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	1050		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	73700		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	6050		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	34		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	24400		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	168		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	21		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	2		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	5960		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	2		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	65100		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-08-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1018-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	67900		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 22-1018-08
Matrix: Groundwater

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 12:00 AM

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

Aliquot #: 22-1018-08-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	150000		ug/L	1000.0	10/10/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-08-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	860		ug/L	25.0	10/18/2022	AB22-1018-01

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1018-08-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	555		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1018-08-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	188000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Bicarbonate	188000		ug/L	10000.0	10/15/2022	AB22-1015-01
Alkalinity Carbonate	ND		ug/L	10000.0	10/15/2022	AB22-1015-01

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-08-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-08-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	2400		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-08-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	2900		ug/L	1000.0	10/12/2022	AB22-1016-08

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-1018-09
Matrix: Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 03:37 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-09-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-09-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	ND		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	ND		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	ND		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-09-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-09-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	10/18/2022	AB22-1018-01

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 22-1018-09
Matrix: Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 03:37 PM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-09-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-09-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-09-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	10/12/2022	AB22-1016-08

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-1018-10
Matrix: Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 01:36 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1018-10-C01-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03

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

Aliquot #: 22-1018-10-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	ND		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	ND		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	ND		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	ND		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1018-10-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1018-10-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	10/18/2022	AB22-1018-01

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 22-1018-10
Matrix: Water

Laboratory Project: **22-1018**
Collect Date: 10/04/2022
Collect Time: 01:36 PM

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1018-10-C04-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-04

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-10-C05-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	10/12/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1018-10-C06-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	10/12/2022	AB22-1016-08

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-1018

Inspection Date: 10/5/22 **Inspection By:** CH

Sample Origin/Project Name: _____

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 2787 4765 2313 Shipping Form Attached: Yes ✓ No _____

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

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

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

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

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

Shipping Containers Received: Opened _____ Sealed ✓

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

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

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

As-Received Temperature Range 0.4 - 1.9°C Samples Received on Ice: Yes ✓ No _____

M&TE # and Expiration 016402 | 5.25.23

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL) or (60mL)	16				
Quart/Liter (g/p)	20				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	40				
24 mL vial (glass)					
~~500~~ 250 mL (plastic)	8				
Other					

pH paper
0.0 - 14.0
Cat: 13-640-508
Lot: 222420
EXP: 8.127

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SAMPLING SITE / CUSTOMER: Q4-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-1018

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: TRC

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1018-01	10-4-22	1336	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	10-4-22	1210	GW	OW-10	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	10-4-22	1350	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	10-4-22	1055	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	10-4-22	0945	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-06	10-4-22	0915	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-07	10-4-22	0840	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-08	10-4-22	—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-09	10-4-22	1537	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	
-10	10-4-22	1336	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 10-4-22/1615 RECEIVED BY: Fedex

RELINQUISHED BY: FedEx DATE/TIME: 10-05-22 10:30 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 0.4-1.8 °C Cal. Due Date: 5-25-23

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

October 13, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q4-2022 DEK Lined Impoundment
22-1018

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 10/10/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 85182 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00894**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-01 DEK-MW-15003**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4700**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**3800**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00895**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-02 OW-10**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**8700**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**8100**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00896**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-03 OW-11**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**14000**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**7000**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00897**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-04 OW-12**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**3500**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**2500**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
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Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00898**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-05 KLI-SCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4200**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**2600**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
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Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00899**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-06 KLI-PCS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**4500**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**3900**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
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Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00900**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-07 SW-DITCH**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**7400**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**5900**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00901**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018 DUP KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**2900**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**2400**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00902**

Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-09 EB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85182**
BA Sample ID: **CS00903**
Project Name: **Q4-2022 DEK Lined Impoundment**
Project Number: **22-1018**
Sample ID: **22-1018-10 FB-KLI**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	10/12/2022
Total Organic Carbon	**Not detected**	ug/L	1000	SM5310B	RG	10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

CHAIN OF CUSTODY

85183 85182

Consumers Energy
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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

Page _____ of _____

SAMPLING SITE / CUSTOMER: Q4-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-1018

SAP CC or WO#:

REQUESTER: Emil Blaj

SAMPLING TEAM:

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

SEND REPORT TO: Emil Blaj

email: Emil.Blaj@cmsenergy.com

phone:

COPY TO:

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	DATE	TIME	MATRIX	FIELD SAMPLE ID / LOCATION	TOTAL #	None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Organic Carbon	Dissolved Organic Carbon	REMARKS (CSO)
22-1018-01	10/04/2022	1336	GW	DEK-MW-15003	2					2			x	x	894
-02	10/04/2022	1210	GW	OW-10	2					2			x	x	895
-03	10/04/2022	1350	GW	OW-11	2					2			x	x	896
-04	10/04/2022	1055	GW	OW-12	2					2			x	x	897
-05	10/04/2022	0945	W	KLI-SCS	2					2			x	x	898
-06	10/04/2022	0915	SW	KLI-PCS	2					2			x	x	899
-07	10/04/2022	0840	SW	SW-DITCH	2					2			x	x	900
-08	10/04/2022	-	GW	DUP-KLI	2					2			x	x	901
-09	10/04/2022	1537	W	EB-KLI	2					2			x	x	902
-10	10/04/2022	1336	W	FB-KLI	2					2			x	x	903

RELINQUISHED BY: [signature] DATE/TIME: 10.10.22 1535 RECEIVED BY: [signature]

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS: **PR #22101090**

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

Temperature: 4.0 °C Cal. Due Date: ______

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 10/12/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CS00896	TV=10000	7000	101/99	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CS00896	17000	16900	0.59	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	99		
Method Standard (Lab. Control Spike):		#3046.6	100		

COMMENTS: _____

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** TOC

Analysis Date: 10/12/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CS00906	TV=10000	5000	102/106	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CS00906	15300	15700	2.60	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	99		
Method Standard (Lab. Control Spike):		#3046.6	100		

COMMENTS: _____

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 10/12/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CS00906	TV=10000	6000	107/106	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CS00906	16700	16600	0.60	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	99		
Method Standard (Lab. Control Spike):		#3046.6	100		

COMMENTS: _____

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 10/12/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries** (%)	**Acceptable Range (%)**	**Method Blank Concentration**
CS00896	TV=10000	14000	99/91	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD** (%)	**Acceptable Range(%)**	
CS00896	24100	23300	3.40	≤ 20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	99		
Method Standard (Lab. Control Spike):		#3046.6	100		

COMMENTS: _____

Analytical Laboratory Report

Report ID: S41137.01(01)
Generated on 10/07/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S41137.01-S41137.10
Project: 22-1019 PR#22101089
Collected Date(s): 10/04/2022
Submitted Date/Time: 10/07/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S41137.01	22-1018-01 (DEK-MW-15003)	Groundwater	10/04/22 13:36
S41137.02	22-1018-02 (OW-10)	Groundwater	10/04/22 12:10
S41137.03	22-1018-03 (OW-11)	Groundwater	10/04/22 13:50
S41137.04	22-1018-04 (OW-12)	Groundwater	10/04/22 10:55
S41137.05	22-1018-05 (KLI-SCS)	Groundwater	10/04/22 09:45
S41137.06	22-1018-06 (KLI-PCS)	Groundwater	10/04/22 09:15
S41137.07	22-1018-07 (SW-DITCH)	Groundwater	10/04/22 08:40
S41137.08	22-1018-08 (DUP-KLI)	Groundwater	10/04/22 00:01
S41137.09	22-1018-09 (EB-KLI)	Groundwater	10/04/22 15:37
S41137.10	22-1018-10 (FB-KLI)	Groundwater	10/04/22 13:36

Analytical Laboratory Report

Lab Sample ID: S41137.01
Sample Tag: 22-1018-01 (DEK-MW-15003)
Collected Date/Time: 10/04/2022 13:36
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.29	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.02
Sample Tag: 22-1018-02 (OW-10)
Collected Date/Time: 10/04/2022 12:10
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:44, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.37	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.03
Sample Tag: 22-1018-03 (OW-11)
Collected Date/Time: 10/04/2022 13:50
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:46, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.04
Sample Tag: 22-1018-04 (OW-12)
Collected Date/Time: 10/04/2022 10:55
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:48, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.05
Sample Tag: 22-1018-05 (KLI-SCS)
Collected Date/Time: 10/04/2022 09:45
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:50, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.06
Sample Tag: 22-1018-06 (KLI-PCS)
Collected Date/Time: 10/04/2022 09:15
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:52, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.07
Sample Tag: 22-1018-07 (SW-DITCH)
Collected Date/Time: 10/04/2022 08:40
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:54, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.08
Sample Tag: 22-1018-08 (DUP-KLI)
Collected Date/Time: 10/04/2022 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.09
Sample Tag: 22-1018-09 (EB-KLI)
Collected Date/Time: 10/04/2022 15:37
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 13:58, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41137.10
Sample Tag: 22-1018-10 (FB-KLI)
Collected Date/Time: 10/04/2022 13:36
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:00, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID: S41137
Client: CONSUMERS (Consumers Energy)
Project: 22-1019 PR#22101089
Submitted: 10/07/2022 08:15 Login User: PFD

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S41137 Submitted: 10/07/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-1019 PR#22101089

Initial Preservation Check: 10/07/2022 09:08 PFD

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S41137.01	125ml Plastic NaOH	>12			
S41137.02	125ml Plastic NaOH	>12			
S41137.03	125ml Plastic NaOH	>12			
S41137.04	125ml Plastic NaOH	>12			
S41137.05	125ml Plastic NaOH	>12			
S41137.06	125ml Plastic NaOH	>12			
S41137.07	125ml Plastic NaOH	>12			
S41137.08	125ml Plastic NaOH	>12			
S41137.09	125ml Plastic NaOH	>12			
S41137.10	125ml Plastic NaOH	>12			

Prepared by Merit Laboratories

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 22-1018 PR#22101089
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
41137.01	10/04/22	1336	22-1018-01 (DEK-MW-15003)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	10/04/22	1210	22-1018-02 (OW-10)	GW	1					1			✓	"
.03	10/04/22	1350	22-1018-03 (OW-11)	GW	1					1			✓	"
.04	10/04/22	1055	22-1018-04 (OW-12)	GW	1					1			✓	"
.05	10/04/22	0945	22-1018-05 (KLI-SCS)	GW	1					1			✓	"
.06	10/04/22	0915	22-1018-06 (KLI-PCS)	GW	1					1			✓	"
.07	10/04/22	0840	22-1018-07 (SW-DITCH)	GW	1					1			✓	"
.08	10/04/22	-	22-1018-08 (DUP-KLI)	GW	1					1			✓	"
.09	10/04/22	1537	22-1018-09 (EB-KLI)	GW	1					1			✓	"
.10	10/04/22	1336	22-1018-10 (FB-KLI)	GW	1					1			✓	"

RELINQUISHED BY: SIGNATURE/ORGANIZATION	CONSUMERS ENERGY ☐ Sampler	DATE 10-06-22	TIME 2145	RELINQUISHED BY: SIGNATURE/ORGANIZATION	Merit Drop Box / Patrick W	DATE 10/7/22	TIME 815
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 10/7/22	TIME 815
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL 3.4
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: October 24, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2022 Q4

CC: HDRegister, P22-521
BLSwanberg, P22-119

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 22-1017

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area on 10/04/2022, for the 4th Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 10/05/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

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

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

CASE NARRATIVE

I. Sample Receipt

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

II. Methodology

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

III. Results/Quality Control

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

DEFINITIONS / QUALIFIERS

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

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

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

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q4-2022 DEK Bottom Ash Pond & Lined Impoundment
Date Received: 10/5/2022
Chemistry Project: 22-1017

Sample #	Field Sample ID	Matrix	Sample Date	Site
22-1017-01	DEK-MW-18001	Groundwater	10/04/2022 12:03 PM	DEK Bottom Ash Pond & Lined Impoundment
22-1017-02	DEK-MW-18001 MS	Groundwater	10/04/2022 12:03 PM	DEK Bottom Ash Pond & Lined Impoundment
22-1017-03	DEK-MW-18001 MSD	Groundwater	10/04/2022 12:03 PM	DEK Bottom Ash Pond & Lined Impoundment

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-1017-01
Matrix: Groundwater

Laboratory Project: **22-1017**
Collect Date: 10/04/2022
Collect Time: 12:03 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1017-01-C01-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/10/2022	AB22-1010-07

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

Aliquot #: 22-1017-01-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	109		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	135		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	1060		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	58300		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	894		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	23		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	10900		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	169		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	2		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	4510		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	103000		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1017-01-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	399		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1017-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	62500		ug/L	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 22-1017-01
Matrix: Groundwater

Laboratory Project: **22-1017**
Collect Date: 10/04/2022
Collect Time: 12:03 PM

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

Aliquot #: 22-1017-01-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	140000		ug/L	1000.0	10/10/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1017-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2400		ug/L	25.0	10/13/2022	AB22-1013-09

Total Dissolved Solids by SM 2540C

Aliquot #: 22-1017-01-C04-A01 **Analyst: CLH**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	551		mg/L	10.0	10/06/2022	AB22-1006-01

Alkalinity by SM 2320B

Aliquot #: 22-1017-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	200000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Bicarbonate	200000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Carbonate	ND		ug/L	10000.0	10/13/2022	AB22-1013-03

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1017-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-03

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1017-01-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4900		ug/L	1000.0	10/11/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1017-01-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5100		ug/L	1000.0	10/11/2022	AB22-1016-08

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-1017-02
Matrix: Groundwater

Laboratory Project: **22-1017**
Collect Date: 10/04/2022
Collect Time: 12:03 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1017-02-C01-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	102		%	0.2	10/10/2022	AB22-1010-07

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

Aliquot #: 22-1017-02-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	107		%	1.0	10/12/2022	AB22-1013-04
Arsenic	97		%	1.0	10/12/2022	AB22-1013-04
Barium	105		%	5.0	10/12/2022	AB22-1013-04
Beryllium	100		%	1.0	10/12/2022	AB22-1013-04
Boron	94		%	20.0	10/12/2022	AB22-1013-04
Cadmium	102		%	0.2	10/12/2022	AB22-1013-04
Calcium	104		%	1000.0	10/16/2022	AB22-1013-04
Chromium	96		%	1.0	10/12/2022	AB22-1013-04
Cobalt	97		%	6.0	10/12/2022	AB22-1013-04
Copper	90		%	1.0	10/12/2022	AB22-1013-04
Iron	113		%	20.0	10/12/2022	AB22-1013-04
Lead	100		%	1.0	10/12/2022	AB22-1013-04
Lithium	103		%	10.0	10/12/2022	AB22-1013-04
Magnesium	110		%	1000.0	10/16/2022	AB22-1013-04
Manganese	98		%	5.0	10/12/2022	AB22-1013-04
Molybdenum	114		%	5.0	10/12/2022	AB22-1013-04
Nickel	94		%	2.0	10/12/2022	AB22-1013-04
Potassium	102		%	100.0	10/16/2022	AB22-1013-04
Selenium	94		%	1.0	10/12/2022	AB22-1013-04
Silver	102		%	0.2	10/12/2022	AB22-1013-04
Sodium	111		%	1000.0	10/16/2022	AB22-1013-04
Thallium	100		%	2.0	10/12/2022	AB22-1013-04
Vanadium	99		%	2.0	10/12/2022	AB22-1013-04
Zinc	90		%	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1017-02-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	81		%	100.0	10/05/2022	AB22-1005-05
Nitrite	87		%	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1017-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	102		%	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 22-1017-02
Matrix: Groundwater

Laboratory Project: **22-1017**
Collect Date: 10/04/2022
Collect Time: 12:03 PM

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

Aliquot #: 22-1017-02-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	90		%	1000.0	10/05/2022	AB22-1010-05
Sulfate	101		%	1000.0	10/10/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1017-02-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	110		%	25.0	10/13/2022	AB22-1013-09

Alkalinity by SM 2320B

Aliquot #: 22-1017-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	97.4		%	10000.0	10/13/2022	AB22-1013-03

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1017-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	40.0	10/07/2022	AB22-1016-03

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1017-02-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	108		%	1000.0	10/11/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1017-02-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	104		%	1000.0	10/11/2022	AB22-1016-08

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-1017-03
Matrix: Groundwater

Laboratory Project: **22-1017**
Collect Date: 10/04/2022
Collect Time: 12:03 PM

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 22-1017-03-C01-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	105		%	0.2	10/10/2022	AB22-1010-07

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

Aliquot #: 22-1017-03-C01-A02 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	106		%	1.0	10/12/2022	AB22-1013-04
Arsenic	96		%	1.0	10/12/2022	AB22-1013-04
Barium	107		%	5.0	10/12/2022	AB22-1013-04
Beryllium	101		%	1.0	10/12/2022	AB22-1013-04
Boron	112		%	20.0	10/12/2022	AB22-1013-04
Cadmium	102		%	0.2	10/12/2022	AB22-1013-04
Calcium	108		%	1000.0	10/16/2022	AB22-1013-04
Chromium	91		%	1.0	10/12/2022	AB22-1013-04
Cobalt	95		%	6.0	10/12/2022	AB22-1013-04
Copper	88		%	1.0	10/12/2022	AB22-1013-04
Iron	113		%	20.0	10/12/2022	AB22-1013-04
Lead	98		%	1.0	10/12/2022	AB22-1013-04
Lithium	102		%	10.0	10/12/2022	AB22-1013-04
Magnesium	108		%	1000.0	10/16/2022	AB22-1013-04
Manganese	94		%	5.0	10/12/2022	AB22-1013-04
Molybdenum	115		%	5.0	10/12/2022	AB22-1013-04
Nickel	92		%	2.0	10/12/2022	AB22-1013-04
Potassium	105		%	100.0	10/16/2022	AB22-1013-04
Selenium	95		%	1.0	10/12/2022	AB22-1013-04
Silver	101		%	0.2	10/12/2022	AB22-1013-04
Sodium	109		%	1000.0	10/16/2022	AB22-1013-04
Thallium	99		%	2.0	10/12/2022	AB22-1013-04
Vanadium	96		%	2.0	10/12/2022	AB22-1013-04
Zinc	90		%	10.0	10/12/2022	AB22-1013-04

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 22-1017-03-C02-A01 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	81		%	100.0	10/05/2022	AB22-1005-05
Nitrite	87		%	100.0	10/05/2022	AB22-1005-05

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

Aliquot #: 22-1017-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	106		%	1000.0	10/10/2022	AB22-1010-05

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Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 22-1017-03
Matrix: Groundwater

Laboratory Project: **22-1017**
Collect Date: 10/04/2022
Collect Time: 12:03 PM

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

Aliquot #: 22-1017-03-C02-A02 **Analyst: DMW**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	91		%	1000.0	10/05/2022	AB22-1010-05
Sulfate	105		%	1000.0	10/10/2022	AB22-1010-05

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 22-1017-03-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	110		%	25.0	10/13/2022	AB22-1013-09

Alkalinity by SM 2320B

Aliquot #: 22-1017-03-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	97.9		%	10000.0	10/13/2022	AB22-1013-03

Sulfide, Total by SM 4500 S2D

Aliquot #: 22-1017-03-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	40.0	10/07/2022	AB22-1016-03

Total Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1017-03-C08-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	102		%	1000.0	10/11/2022	AB22-1016-07

Dissolved Organic Carbon by SM 5310B, Aqueous

Aliquot #: 22-1017-03-C09-A01 **Analyst: BAL**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	110		%	1000.0	10/11/2022	AB22-1016-08

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Log-In Number: 22-1017 / 221016

Inspection Date: 10/5/22 **Inspection By:** CH

Sample Origin/Project Name: _____

Shipment Delivered By: Enter the type of shipment carrier.

Pony _____ FedEx ✓ UPS _____ USPS _____ Airborne _____

Other/Hand Carry (whom) _____

Tracking Number: 2787 4765 8302 Shipping Form Attached: Yes ✓ No _____

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

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

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

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

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

Shipping Containers Received: Opened _____ Sealed ✓

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

CoC ✓ Work Request _____ Air Data Sheet _____ Other _____

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

As-Received Temperature Range 0.0 - 1.9°C Samples Received on Ice: Yes X No _____

M&TE # and Expiration: 15402 / 5.25.23

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

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	14				
Quart/Liter (g/p)	18				
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	36				
24 mL vial (glass)					
~~500~~ 250 mL (plastic)	5				
Other					

pH paper 0.0-14.0
13-640-508
Lot: 222420
Exp: 8.1.23

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q4-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-1017

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: Andrew Whaley

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1017-01	10/4/22	1203	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02			GW	DEK-MW-18001 MS	8	3	1	1	1	2			x	x	x		x	x	x	x	
-03			GW	DEK-MW-18001 MSD	8	3	1	1	1	2			x	x	x		x	x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 10-4-22 1615 RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex DATE/TIME: 10-05-22 10:30 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015902

Temperature 0.0-1.8 °C Cal. Due Date: 5-25-23

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

October 13, 2022

Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

Subject: Q4-2022 DEK Bottom Ash Pond & Lined Impound
22-1017

Dear Mr. Blaj :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 10/10/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 85178 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85178**
BA Sample ID: **CS00877**

Project Name: **Q4-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-1017**
Sample ID: **22-1017-01 DEK-MW-18001**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	**5100**	ug/L	1000	SM5310B	RG	10/11/2022
Total Organic Carbon	**4900**	ug/L	1000	SM5310B	RG	10/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To: Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85178**
BA Sample ID: **CS00878**

Project Name: **Q4-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-1017**
Sample ID: **22-1017-02 DEK-MW-18001 MS**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon, MS, MSD	**104%**	%		SM5310B	RG	10/11/2022
Total Organic Carbon MS, MSD	**108%**	%		SW846 9060	RG	10/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
EGLE Certified #9404
NELAC Accredited #176507

Sample Date: 10/04/2022
Submit Date: 10/10/2022
Report Date: 10/13/2022

To:
Consumers Energy Company
135 W. Trail St.
Jackson, MI 49201

BA Report Number: **85178**
BA Sample ID: **CS00879**

Project Name: **Q4-2022 DEK Bottom Ash Pond & Lined Impound**
Project Number: **22-1017**
Sample ID: **22-1017-03 DEK-MW-18001 MSD**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon, MS, MSD	**110%**	%		SM5310B	RG	10/11/2022
Total Organic Carbon MS, MSD	**102%**	%		SW846 9060	RG	10/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date 10/13/2022

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8578

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Page ____ of ____

SAMPLING SITE / CUSTOMER: Q4-2022 DEK Bottom Ash Pond & Lined Impound.	PROJECT NUMBER: 22-1017	SAP CC or WO#:	
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER ____	REQUESTER: Emil Blaj	
SEND REPORT TO: Emil Blaj	email:Emil.Blaj@cmsenergy.com	phone:	
COPY TO:			

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

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	ANALYSIS REQUESTED: Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1017-01	10/04/2022	1203	GW	DEK-MW-18001	2					2			x	x	C5=577
-02	10/04/2022	1203	GW	DEK-MW-18001 MS	2					2			x	x	578
-03	10/04/2022	1203	GW	DEK-MW-18001 MSD	2					2			x	x	579

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

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
Teresa Okafor	10.10.22 1555	
RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:

COMMENTS:
PR #22101090

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

Temperature: 4.2 °C Cal. Due Date: ____

22-1017 Page 18 of 31

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: RG **Parameter:** DOC

Analysis Date: 10/11/2022 **Method Reference:** EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	**Spike level** PPB	**Background** PPB	**Recoveries (%)**	**Acceptable Range (%)**	**Method Blank Concentration**
CS00877	TV=10000	5100	104/110	80 - 120	ND
Laboratory ID	**Observed A** PPB	**Observed B** PPB	**RPD (%)**	**Acceptable Range(%)**	
CS00877	15500	16100	3.80	≤20	
MISCELLANEOUS					
		Standard ID #	**%Recoveries**		
Independent Secondary Reference Material:		#4295.1	102		
Method Standard (Lab. Control Spike):		#3046.6	106		

COMMENTS: _____

Analytical Laboratory Report

Report ID: S41139.01(01)
Generated on 10/07/2022

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S41139.01-S41139.03
Project: 22-1017 PR#22101089
Collected Date(s): 10/04/2022
Submitted Date/Time: 10/07/2022 08:15
Sampled by: Unknown
P.O. #: 4400106050

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4450 S2 D 2011

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S41139.01	22-1017-01 (DEK-MW-18001)	Groundwater	10/04/22 12:03
S41139.02	22-1017-02 (DEK-MW-18001 Field MS)	Groundwater	10/04/22 12:03
S41139.03	22-1017-03 (DEK-MW-18001 Field MSD)	Groundwater	10/04/22 12:03

Analytical Laboratory Report

Lab Sample ID: S41139.01
Sample Tag: 22-1017-01 (DEK-MW-18001)
Collected Date/Time: 10/04/2022 12:03
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 10:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S41139.02
Sample Tag: 22-1017-02 (DEK-MW-18001 Field MS)
Collected Date/Time: 10/04/2022 12:03
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 10:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.183	0.02	0.005	mg/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L

Analytical Laboratory Report

Lab Sample ID: S41139.03
Sample Tag: 22-1017-03 (DEK-MW-18001 Field MSD)
Collected Date/Time: 10/04/2022 12:03
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 10:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.184	0.02	0.005	mg/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L

Merit Laboratories Login Checklist

Lab Set ID: S41139
Client: CONSUMERS (Consumers Energy)
Project: 22-1017 PR#22101089
Submitted: 10/07/2022 08:15 Login User: PFD

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[X] Yes	[ ] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[X] Yes	[ ] No	[ ] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Prepared by Merit Laboratories

Merit Laboratories Bottle Preservation Check

Lab Set ID: S41139 Submitted: 10/07/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-1017 PR#22101089

Initial Preservation Check: 10/07/2022 09:14 PFD

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S41139.01	125ml Plastic NaOH	>12			
S41139.02	125ml Plastic NaOH	>12			
S41139.03	125ml Plastic NaOH	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400106050
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 22-1017 PR#22101089
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

MERIT LAB NO. (FOR LAB USE ONLY)	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
413801	10/04/22	1203	22-1017-01 (DEK-MW-18001)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	10/04/22	1203	22-1017-02 (DEK-MW-18001 Field MS)	GW	1					1			✓	"
.03	10/04/22	1203	22-1017-03 (DEK-MW-18001 Field MSD)	GW	1					1			✓	"
														Please spike MS/MSD and report
														spike concentration and/or rec.

RELINQUISHED BY: SIGNATURE/ORGANIZATION: CONSUMERS ENERGY ☐ Sampler | DATE: 10-06-22 | TIME: 2145
RECEIVED BY: SIGNATURE/ORGANIZATION | DATE | TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION | DATE | TIME
RECEIVED BY: SIGNATURE/ORGANIZATION | DATE | TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Merit Drop Box | DATE: 10/7/22 | TIME: 815
RECEIVED BY: SIGNATURE/ORGANIZATION: Patrick Wer | DATE: 10/7/22 | TIME: 815

SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS
SEAL NO. | SEAL INTACT YES ☐ NO ☐ | INITIALS

NOTES: | TEMP. ON ARRIVAL: 3.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

eurofins | Environment Testing

ANALYTICAL REPORT

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Tel: (330)497-9396

Laboratory Job ID: 240-174330-1
Client Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Kris Brooks

Authorized for release by:
11/10/2022 4:25:45 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Qualifiers

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

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

Job ID: 240-174330-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-174330-1

Receipt
The samples were received on 10/8/2022 9:55 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.8°C, 1.2°C, 1.4°C, 2.2°C, 3.1°C and 4.1°C

Gas Flow Proportional Counter
Method 903.0: Radium-226 batch 586489Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference DateDEK-MW-15003 (240-174330-1), OW-10 (240-174330-2), OW-11 (240-174330-3), OW-12 (240-174330-4), KLI-SCS (240-174330-5), DUP-KLI (240-174330-6), (LCS 160-586489/2-A), (MB 160-586489/1-A), (180-145631-A-1-A) and (180-145631-A-1-B DU)

Method 904.0: Radium-228 batch 586571The detection goal was not met for the following sample(s). Sample was prepped at a reduced volume due to the presence of matrix interferences: DEK-MW-15003 (240-174330-1). Analytical results are reported with the detection limit achieved.

Method 904.0: Radium-228 batch 586571Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference DateDEK-MW-15003 (240-174330-1), OW-10 (240-174330-2), OW-11 (240-174330-3), OW-12 (240-174330-4), KLI-SCS (240-174330-5), DUP-KLI (240-174330-6), (LCS 160-586571/2-A), (MB 160-586571/1-A), (180-145631-A-1-C) and (180-145631-A-1-D DU)

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

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

Method Summary

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-174330-1	DEK-MW-15003	Water	10/04/22 13:36	10/08/22 09:55
240-174330-2	OW-10	Water	10/04/22 12:10	10/08/22 09:55
240-174330-3	OW-11	Water	10/04/22 13:50	10/08/22 09:55
240-174330-4	OW-12	Water	10/04/22 10:55	10/08/22 09:55
240-174330-5	KLI-SCS	Water	10/04/22 09:45	10/08/22 09:55
240-174330-6	DUP-KLI	Water	10/04/22 00:00	10/08/22 09:55

Client Sample ID: DEK-MW-15003 — Lab Sample ID: 240-174330-1

Date Collected: 10/04/22 13:36 — **Matrix: Water**
Date Received: 10/08/22 09:55

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0203	U	0.109	0.109	1.00	0.207	pCi/L	10/19/22 12:19	11/09/22 16:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.1*		*40 - 110*	*10/19/22 12:19*	*11/09/22 16:00*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**2.13**	**G**	0.783	0.807	1.00	1.04	pCi/L	10/19/22 13:40	11/02/22 13:56	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.1*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:56*	*1*
Y Carrier	*89.7*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:56*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**2.15**		0.791	0.814	5.00	1.04	pCi/L		11/10/22 13:17	1

Client Sample ID: OW-10 — Lab Sample ID: 240-174330-2

Date Collected: 10/04/22 12:10 — **Matrix: Water**
Date Received: 10/08/22 09:55

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.122	U	0.0981	0.0987	1.00	0.141	pCi/L	10/19/22 12:19	11/09/22 16:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.4*		*40 - 110*	*10/19/22 12:19*	*11/09/22 16:01*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.84**		0.605	0.628	1.00	0.714	pCi/L	10/19/22 13:40	11/02/22 13:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.4*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:50*	*1*
Y Carrier	*88.6*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:50*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.96**		0.613	0.636	5.00	0.714	pCi/L		11/10/22 13:17	1

Client Sample ID: OW-11
Date Collected: 10/04/22 13:50
Date Received: 10/08/22 09:55

Lab Sample ID: 240-174330-3
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0722	U	0.0945	0.0947	1.00	0.158	pCi/L	10/19/22 12:19	11/09/22 16:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.0*		*40 - 110*	*10/19/22 12:19*	*11/09/22 16:01*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.27**		0.563	0.575	1.00	0.733	pCi/L	10/19/22 13:40	11/02/22 13:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.0*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:50*	*1*
Y Carrier	*87.1*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:50*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.35**		0.571	0.583	5.00	0.733	pCi/L		11/10/22 13:17	1

Client Sample ID: OW-12
Date Collected: 10/04/22 10:55
Date Received: 10/08/22 09:55

Lab Sample ID: 240-174330-4
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.137		0.0803	0.0813	1.00	0.100	pCi/L	10/19/22 12:19	11/09/22 16:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.8*		*40 - 110*	*10/19/22 12:19*	*11/09/22 16:01*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.78		0.495	0.521	1.00	0.554	pCi/L	10/19/22 13:40	11/02/22 13:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.8*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:50*	*1*
Y Carrier	*88.6*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:50*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.91		0.501	0.527	5.00	0.554	pCi/L		11/10/22 13:17	1

Client Sample ID: KLI-SCS
Date Collected: 10/04/22 09:45
Date Received: 10/08/22 09:55

Lab Sample ID: 240-174330-5
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.106	U	0.102	0.103	1.00	0.160	pCi/L	10/19/22 12:19	11/09/22 17:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*10/19/22 12:19*	*11/09/22 17:48*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.79**		0.578	0.601	1.00	0.676	pCi/L	10/19/22 13:40	11/02/22 13:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.3*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:51*	*1*
Y Carrier	*89.3*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:51*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.89**		0.587	0.610	5.00	0.676	pCi/L		11/10/22 13:17	1

Client Sample ID: DUP-KLI
Date Collected: 10/04/22 00:00
Date Received: 10/08/22 09:55

Lab Sample ID: 240-174330-6
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.105	U	0.0791	0.0797	1.00	0.113	pCi/L	10/19/22 12:19	11/09/22 17:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*40 - 110*	*10/19/22 12:19*	*11/09/22 17:48*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.12**		0.395	0.408	1.00	0.461	pCi/L	10/19/22 13:40	11/02/22 13:51	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:51*	*1*
Y Carrier	*89.3*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:51*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.22**		0.403	0.416	5.00	0.461	pCi/L		11/10/22 13:17	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
240-174330-1	DEK-MW-15003	82.1
240-174330-2	OW-10	92.4
240-174330-3	OW-11	86.0
240-174330-4	OW-12	95.8
240-174330-5	KLI-SCS	97.3
240-174330-6	DUP-KLI	96.8
LCS 160-586489/2-A	Lab Control Sample	99.8
MB 160-586489/1-A	Method Blank	99.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
240-174330-1	DEK-MW-15003	82.1	89.7
240-174330-2	OW-10	92.4	88.6
240-174330-3	OW-11	86.0	87.1
240-174330-4	OW-12	95.8	88.6
240-174330-5	KLI-SCS	97.3	89.3
240-174330-6	DUP-KLI	96.8	89.3
LCS 160-586571/2-A	Lab Control Sample	99.8	87.1
MB 160-586571/1-A	Method Blank	99.8	83.7

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-586489/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 589429 — **Prep Batch: 586489**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.01471	U	0.0601	0.0601	1.00	0.127	pCi/L	10/19/22 12:19	11/09/22 15:55	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.8*		*40 - 110*	*10/19/22 12:19*	*11/09/22 15:55*	*1*

Lab Sample ID: LCS 160-586489/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 589429 — **Prep Batch: 586489**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.66		1.20	1.00	0.0930	pCi/L	103	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*99.8*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-586571/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 588252 — **Prep Batch: 586571**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.001		0.423	0.433	1.00	0.557	pCi/L	10/19/22 13:40	11/02/22 13:54	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.8*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:54*	*1*
Y Carrier	*83.7*		*40 - 110*	*10/19/22 13:40*	*11/02/22 13:54*	*1*

Lab Sample ID: LCS 160-586571/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 588252 — **Prep Batch: 586571**

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.48	9.458		1.48	1.00	0.776	pCi/L	112	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*99.8*		*40 - 110*
Y Carrier	*87.1*		*40 - 110*

QC Association Summary

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Rad

Prep Batch: 586489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174330-1	DEK-MW-15003	Total/NA	Water	PrecSep STD	
240-174330-2	OW-10	Total/NA	Water	PrecSep STD	
240-174330-3	OW-11	Total/NA	Water	PrecSep STD	
240-174330-4	OW-12	Total/NA	Water	PrecSep STD	
240-174330-5	KLI-SCS	Total/NA	Water	PrecSep STD	
240-174330-6	DUP-KLI	Total/NA	Water	PrecSep STD	
MB 160-586489/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-586489/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	

Prep Batch: 586571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174330-1	DEK-MW-15003	Total/NA	Water	PrecSep_0	
240-174330-2	OW-10	Total/NA	Water	PrecSep_0	
240-174330-3	OW-11	Total/NA	Water	PrecSep_0	
240-174330-4	OW-12	Total/NA	Water	PrecSep_0	
240-174330-5	KLI-SCS	Total/NA	Water	PrecSep_0	
240-174330-6	DUP-KLI	Total/NA	Water	PrecSep_0	
MB 160-586571/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-586571/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Client Sample ID: DEK-MW-15003 Lab Sample ID: 240-174330-1

Date Collected: 10/04/22 13:36 **Matrix: Water**
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 16:00
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:56
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: OW-10 Lab Sample ID: 240-174330-2

Date Collected: 10/04/22 12:10 **Matrix: Water**
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 16:01
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588204	FLC	EET SL	11/02/22 13:50
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: OW-11 Lab Sample ID: 240-174330-3

Date Collected: 10/04/22 13:50 **Matrix: Water**
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 16:01
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588204	FLC	EET SL	11/02/22 13:50
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: OW-12 Lab Sample ID: 240-174330-4

Date Collected: 10/04/22 10:55 **Matrix: Water**
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 16:01
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588204	FLC	EET SL	11/02/22 13:50
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Client Sample ID: KLI-SCS — Lab Sample ID: 240-174330-5

Date Collected: 10/04/22 09:45 — **Matrix: Water**
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 17:48
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588204	FLC	EET SL	11/02/22 13:51
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: DUP-KLI — Lab Sample ID: 240-174330-6

Date Collected: 10/04/22 00:00 — **Matrix: Water**
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 17:48
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588204	FLC	EET SL	11/02/22 13:51
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Job ID: 240-174330-1
Project/Site: Karn/Weadock CCR DEK Lined Inpoundment

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	07-01-22 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22 *
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-24
Washington	State	C592	08-30-23
West Virginia DEP	State	381	12-31-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

MICHIGAN 190

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Jacob Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99544-29054.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page of
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: 178827			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Lined Impoundment	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
DEK-MW-15003	10-4-22	1336	G	Water	N	N	X	X		
OW-10	10-4-22	1210	G	Water	N	N	X	X		
OW-11	10-4-22	1350	G	Water	N	N	X	X		
OW-12	10-4-22	1055	G	Water	N	N	X	X		
KLI-SCS	10-4-22	0945	G	Water	N	N	X	X		
DUP-KLI	10-4-22	—	G	Water	N	N	X	X		
EB-KLI	10-4-22		G	Water	N	N	X	X		
				Water						

240-174330 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant Poison B ...ological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-7-22 1016	TRC		10/7/22 10:15	EETA
2		10/7/22 10:20	EETA		10-8-22 955	EETMC
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

11/10/2022

Eurofins - Canton Sample Receipt Form/Narrative Login # : _____
Barberton Facility

Client TRC Site Name _____ Cooler unpacked by: Jamy Boyle

Cooler Received on 10-8-22 Opened on 10-8-22

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

Eurofins Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-13 (CF +0.7 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF 0.0°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 each	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC286797
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

Sample - EB-KL1 - 10-4-22 - Not in cooler

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : ____________

Eurofins - Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-13 IR-15	3.1	3.1	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	1.4	1.4	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	2.2	2.2	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	1.2	1.2	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	4.1	4.1	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	0.8	0.8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
DEK-MW-15003	240-174330-A-1	Plastic 1 liter - Nitric Acid	<2			
DEK-MW-15003	240-174330-B-1	Plastic 1 liter - Nitric Acid	<2			
OW-10	240-174330-A-2	Plastic 1 liter - Nitric Acid	<2			
OW-10	240-174330-B-2	Plastic 1 liter - Nitric Acid	<2			
OW-11	240-174330-A-3	Plastic 1 liter - Nitric Acid	<2			
OW-11	240-174330-B-3	Plastic 1 liter - Nitric Acid	<2			
OW-12	240-174330-A-4	Plastic 1 liter - Nitric Acid	<2			
OW-12	240-174330-B-4	Plastic 1 liter - Nitric Acid	<2			
KLI-SCS	240-174330-A-5	Plastic 1 liter - Nitric Acid	<2			
KLI-SCS	240-174330-B-5	Plastic 1 liter - Nitric Acid	<2			
DUP-KLI	240-174330-A-6	Plastic 1 liter - Nitric Acid	<2			
DUP-KLI	240-174330-B-6	Plastic 1 liter - Nitric Acid	<2			

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-158469.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-174330-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 11/8/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Karn/Weadock CCR Groundwater Monitoring	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
DEK-MW-15003 (240-174330-1)	10/4/22	13:36 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
OW-10 (240-174330-2)	10/4/22	12:10 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
OW-11 (240-174330-3)	10/4/22	13:50 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
OW-12 (240-174330-4)	10/4/22	10:55 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
KLI-SCS (240-174330-5)	10/4/22	09:45 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
DUP-KLI (240-174330-6)	10/4/22	Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by:	Date/Time: 10-10-22 1000	Company	Received by: FED EX	Date/Time:	Company
Relinquished by: FED EX	Date/Time:	Company	Received by:	Date/Time: OCT 11 2022 0830	Company
Relinquished by:	Date/Time:	Company	Received by: Autumn R. Johnson	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

10/11/2022

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-174330-1

Login Number: 174330
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 10/11/22 01:02 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Tel: (330)497-9396

Laboratory Job ID: 240-174334-1
Client Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

For:
TRC Environmental Corporation.
1540 Eisenhower Place
Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Kris Brooks

Authorized for release by:
11/11/2022 8:17:08 PM

Kris Brooks, Project Manager II
(330)966-9790
Kris.Brooks@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: TRC Environmental Corporation.
Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Qualifiers

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

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

Client: TRC Environmental Corporation. Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Job ID: 240-174334-1

Laboratory: Eurofins Canton

Narrative

Job Narrative
240-174334-1

Receipt
The sample was received on 10/8/2022 9:55 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.8°C, 1.2°C, 1.4°C, 2.2°C, 3.1°C and 4.1°C

Gas Flow Proportional Counter
Method 903.0: Radium-226 batch 586581Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.DEK-MW-18001 (240-174334-1), (LCS 160-586581/2-A), (MB 160-586581/1-A), (240-174332-A-1-A) and (240-174332-B-1-A DU)

Method 904.0: Radium-228 batch 586588The detection goal was not met for the following sample(s). The samples and batch QC were prepped at full volume. Matrix interferences are suspected because the method blank achieved the detection goal demonstrating acceptable sample preparation and instrument performance: DEK-MW-18001 (240-174334-1). Analytical results are reported with the detection limit achieved.

Method 904.0: Radium-228 batch 586588Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference DateDEK-MW-18001 (240-174334-1), (LCS 160-586588/2-A), (MB 160-586588/1-A), (240-174332-A-1-B) and (240-174332-B-1-B DU)

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

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

Method Summary

Client: TRC Environmental Corporation.
Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Job ID: 240-174334-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-174334-1	DEK-MW-18001	Water	10/04/22 12:03	10/08/22 09:55

Client Sample Results

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Job ID: 240-174334-1

Client Sample ID: DEK-MW-18001
Date Collected: 10/04/22 12:03
Date Received: 10/08/22 09:55

Lab Sample ID: 240-174334-1
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.264		0.167	0.168	1.00	0.232	pCi/L	10/19/22 14:28	11/11/22 09:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*51.7*		*40 - 110*	*10/19/22 14:28*	*11/11/22 09:52*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.67	G	0.771	0.787	1.00	1.05	pCi/L	10/19/22 15:04	11/04/22 13:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*51.7*		*40 - 110*	*10/19/22 15:04*	*11/04/22 13:50*	*1*
Y Carrier	*82.2*		*40 - 110*	*10/19/22 15:04*	*11/04/22 13:50*	*1*

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.93		0.789	0.805	5.00	1.05	pCi/L		11/11/22 16:43	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.
Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)							
		Ba							
Lab Sample ID	Client Sample ID	(40-110)							
240-174334-1	DEK-MW-18001	51.7							
LCS 160-586581/2-A	Lab Control Sample	85.8							
MB 160-586581/1-A	Method Blank	79.9							

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)							
		Ba	Y						
Lab Sample ID	Client Sample ID	(40-110)	(40-110)						
240-174334-1	DEK-MW-18001	51.7	82.2						
LCS 160-586588/2-A	Lab Control Sample	85.8	88.6						
MB 160-586588/1-A	Method Blank	79.9	77.0						

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Job ID: 240-174334-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-586581/1-A
Matrix: Water
Analysis Batch: 589758

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 586581

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.005428	U	0.0568	0.0568	1.00	0.118	pCi/L	10/19/22 14:28	11/11/22 09:51	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.9*		*40 - 110*	*10/19/22 14:28*	*11/11/22 09:51*	*1*

Lab Sample ID: LCS 160-586581/2-A
Matrix: Water
Analysis Batch: 589758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 586581

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.891		1.07	1.00	0.134	pCi/L	87	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*85.8*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-586588/1-A
Matrix: Water
Analysis Batch: 588685

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 586588

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2209	U	0.372	0.373	1.00	0.640	pCi/L	10/19/22 15:04	11/04/22 13:44	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.9*		*40 - 110*	*10/19/22 15:04*	*11/04/22 13:44*	*1*
Y Carrier	*77.0*		*40 - 110*	*10/19/22 15:04*	*11/04/22 13:44*	*1*

Lab Sample ID: LCS 160-586588/2-A
Matrix: Water
Analysis Batch: 588685

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 586588

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.47	9.405		1.31	1.00	0.553	pCi/L	111	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*85.8*		*40 - 110*
Y Carrier	*88.6*		*40 - 110*

QC Association Summary

Client: TRC Environmental Corporation.
Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Rad

Prep Batch: 586581

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174334-1	DEK-MW-18001	Total/NA	Water	PrecSep STD	
MB 160-586581/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-586581/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	

Prep Batch: 586588

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174334-1	DEK-MW-18001	Total/NA	Water	PrecSep_0	
MB 160-586588/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-586588/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: TRC Environmental Corporation.
Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Client Sample ID: DEK-MW-18001
Lab Sample ID: 240-174334-1
Date Collected: 10/04/22 12:03
Matrix: Water
Date Received: 10/08/22 09:55

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	PrecSep STD			586581	ZR	EET SL	10/19/22 14:28
Total/NA	Analysis	903.0		1	589758	FLC	EET SL	11/11/22 09:52
Total/NA	Prep	PrecSep_0			586588	ZR	EET SL	10/19/22 15:04
Total/NA	Analysis	904.0		1	588708	FLC	EET SL	11/04/22 13:50
Total/NA	Analysis	Ra226_Ra228		1	589771	MLK	EET SL	11/11/22 16:43

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation.
Job ID: 240-174334-1
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	07-01-22 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22 *
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-24
Washington	State	C592	08-30-23
West Virginia DEP	State	381	12-31-22

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Andrew Whaley	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99542-29053.1
Client Contact: Jacob Krenz	Phone: 734-210-9237	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page of
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes: A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: 178827			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond & I	Project #: 24024154			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
DEK-MW-18001	10/4/22	1203	G	Water	N	N	X	X		
				Water						

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
[X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological	[ ] Return To Client [ ] Disposal By Lab [ ] Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-7-22 1016			10/7/22 1015	EETA
2		10/7/22 1617	EETA		10-8-22 955	EETNC
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins - Canton Sample Receipt Form/Narrative Login # :_____
Barberton Facility

Client TRC Site Name_____ Cooler unpacked by: Jamy Royle

Cooler Received on 10-8-22 Opened on 10-8-22

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off Eurofins Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

Eurofins Cooler # 1A Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt X See Multiple Cooler Form
   IR GUN# IR-13 (CF +0.7 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF 0.0°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC286797
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s):_____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : ____________

Eurofins - Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-13 IR-15	3.1	3.1	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	1-4	1.4	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	2.2	2.2	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	1-2	1.2	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	4.1	4.1	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15	0.8	0.8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

Login Container Summary Report

Temperature readings: _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservative Added (mls)	Lot #
DEK-MW-18001	240-174334-A-1	Plastic 1 liter - Nitric Acid	<2			
DEK-MW-18001	240-174334-B-1	Plastic 1 liter - Nitric Acid	<2			

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-158469.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 240-174334-1
Address: 13715 Rider Trail North,	Due Date Requested: 11/8/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Karn/Weadock CCR Groundwater Monitoring	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_STD Standard Target List	904.0/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
DEK-MW-18001 (240-174334-1)	10/4/22	12:03 Eastern		Water			X	X	X	2	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 10/22 1000	Company ET NC	Received by: FED EX
Relinquished by: FED EX	Date/Time:	Company	Received by: Autumn R. Johnson
Relinquished by:	Date/Time:	Company	Received by: Autumn R. Johnson

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Received by:	Date/Time:	Company
Received by:	Date/Time: OCT 11 2022 0830	Company ET NC
Received by:	Date/Time:	Company

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11/11/2022

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-174334-1

Login Number: 174334
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 10/11/22 01:02 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix B
Field Notes

TRC

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance
PROJECT NUMBER:	464095.0001.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	10/3/2022 TO 10/6/22 ~~10/7/2022~~
PURPOSE OF FIELDWORK:	Fourth Quarter Supplemental Sampling Event
WORK PERFORMED BY:	Jake Krenz, Javier Jasso, Andrew Whaley

10/7/22
SIGNED DATE

10-14-22
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn LF: 2022 GW Complian	DATE: 10/4/22	TIME ARRIVED: 0715
PROJECT NUMBER:	464095.0000.0000	AUTHOR: AW/DK	TIME LEFT: 1730

WEATHER		
TEMPERATURE: 50 °F	WIND: 0-5 MPH	VISIBILITY: clear

WORK / SAMPLING PERFORMED

Sampled wells: DEK-MW-15002, DEK-MW-15005, DEK-MW-15006, DEK-MW-18001, OW-11, MW-15008, and MW-15019

Sampled wells: OW-10, OW-12, DEK-MW-15003
collected samples: KLI PCS, KLI SCS, SW-Ditch
shipped samples

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM
Caleb Batts	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
GW	NM	Purged 40 ground

Andrew Whaley 10/11/22
SIGNED DATE

[signature] 10-14-22
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Comp	DATE: 10/6/22	TIME ARRIVED: 0942
PROJECT NUMBER: 464095.0001.0000	AUTHOR: Jake Krenz, Javier Jasso	TIME LEFT: 1041

WEATHER		
TEMPERATURE: 51 °F	WIND: 10 MPH	VISIBILITY: Over Cast

WORK / SAMPLING PERFORMED

Wells Sam
DFKMW-22006, 22003, 22004, 22002, 22001, 22005
15004
Dropping of samples at Lab

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS

10/7/22
SIGNED DATE

10-14-22
CHECKED BY DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW	SAMPLER NAME:	Jake Krenz, Javier Jasso, Andrew Whale
PROJECT NO.:	464095.0001.0000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NA	NA
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PURGING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)

SAMPLING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
GEOTECH DISPOSABLE FILTER	0.45 MICRON
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

STORE BOUGHT	LABORATORY PROVIDED
POTABLE WATER SOURCE	DI WATER SOURCE
10/7/22	10-14-22
SIGNED / DATE	CHECKED BY / DATE

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW Compliance	MODEL: YSI Pro DSS	SAMPLER: AW, (JK), JJ
PROJECT NO.:	464095.0001.0000	SERIAL #: Rental	DATE: 10-4-22

PH CALIBRATION CHECK

pH 7 (LOT #): 26F083 (EXP. DATE): Jun/24 — POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 26D849 (EXP. DATE): APR/24 — POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.09 / 7.09	4.00 / 4.00	☒ WITHIN RANGE	0737
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 26D499 (EXP. DATE): 4/25 — POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
990 / 990	6.7	☒ WITHIN RANGE	0731
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 220100138 (EXP. DATE): 4-9-27 — POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
194.3 / 194.3	5.5	☒ WITHIN RANGE	0741
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING — POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
11.98 / 11.98	6.2	☒ WITHIN RANGE	0745
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): DI water (EXP. DATE): — POST-CAL. READING / STANDARD	(LOT #): A2172 (EXP. DATE): Jun-24 — POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0.0 / 0.0	100.0 / 100.0	☒ WITHIN RANGE	0748
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) — LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED 10-4-22 DATE

CHECKED BY AW 10/20/22 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn LF: 2022 GW Compliance	MODEL:	Pro DSS	SAMPLER:	(AW) JJ, JK
PROJECT NO.:	464095.0000.0000	SERIAL #:	AA office	DATE:	10/4/22

PH CALIBRATION CHECK

pH 7 (LOT #): 20F0853 (EXP. DATE): Jun/24 POST-CAL. READING / STANDARD	pH (4) 10 (LOT #): 20E433 (EXP. DATE): Mar/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.00 / 7.00	4.00 / 4.00	☒ WITHIN RANGE	735
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

~~SPECIFIC~~ CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 20F716 (EXP. DATE): Jun/23 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1216 / 1216	6.9	☒ WITHIN RANGE	740
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 22D100138 (EXP. DATE): Apr/27 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
246 / 246	8.5	☒ WITHIN RANGE	743
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
10.1 / 10.1	11.6	☒ WITHIN RANGE	745
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): 266.0247 (EXP. DATE): Jun/24 POST-CAL. READING / STANDARD	(LOT #): 20660248 (EXP. DATE): Jun/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0.00 / 0.00	100.5 / 100.0	☒ WITHIN RANGE	750
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION
(LOT #):
(EXP. DATE):

☑ STANDARD SOLUTION (S)
LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK

CALIBRATED PARAMETERS		CALIBRATION RANGES [1]	
☐	pH	pH:	+/- 0.2 S.U.
☐	COND	COND:	+/- 1% OF CAL. STANDARD
☐	ORP	ORP:	+/- 25 mV
☐	D.O.	D.O.:	VARIES
☐	TURB	TURB:	+/- 5% OF CAL. STANDARD
☐	_____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER	
☐	_____		

NOTES

Turbidity on Separate Meter

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

a. whaley — SIGNED — 10/11/22 — DATE

CHECKED BY — 10-14-22 — DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn LF: 2022 GW Compliance	MODEL: YSI Pro DSS	SAMPLER: AW, (JJ) JK
PROJECT NO.:	464095.0000.0000	SERIAL #: Rental	DATE: 10/6/22

PH CALIBRATION CHECK

pH 7 (LOT #): 26F0603 (EXP. DATE): 6/24 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 260849 (EXP. DATE): 4/24 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.00 / 7.00	4.00 / 4.01	☑ WITHIN RANGE	0411
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 26F716 (EXP. DATE): 6/23 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1409 / 1413	21.1	☑ WITHIN RANGE	0411
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21K100307 (EXP. DATE): 11/24 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
220 / 220	22.0	☑ WITHIN RANGE	0411
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
8.81 / 8.81	22	☑ WITHIN RANGE	0411
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A2172 (EXP. DATE): 6/24 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0 / 0	/	☑ WITHIN RANGE	0415
100 / 10	/	☑ WITHIN RANGE	0411
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION
(LOT #):
(EXP. DATE):

☑ STANDARD SOLUTION (S)
LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK

CALIBRATED PARAMETERS		CALIBRATION RANGES [1]	
☐	pH	pH:	+/- 0.2 S.U.
☐	COND	COND:	+/- 1% OF CAL. STANDARD
☐	ORP	ORP:	+/- 25 mV
☐	D.O.	D.O.:	VARIES
☐	TURB	TURB:	+/- 5% OF CAL. STANDARD
☐	_____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER	
☐	_____		

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED 10/7/22 DATE

CHECKED BY 10-14-22 DATE

TRC

WATER LEVEL DATA

PROJECT NAME: CEC Karn BAP/LI: 2022 GW Compliance	DATE: 10/3/22
PROJECT NUMBER: 464095.0001.0000	AUTHOR: ~~Andrew Whaley, Jake Krenz,~~ Jennifer Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
DE Karn Bottom Ash Pond						
DEK-MW-15002	0935		7.00	17.75		
DEK-MW-15004	0956		28.45	41.60		
DEK-MW-15005	0912		9.60	22.37		
DEK-MW-15006	0915		9.30	21.50		
DE Karn Bottom Ash Pond and Lined Impoundment						
DEK-MW-18001	0941		8.98	19.65		
DEK-MW-15003	0617		9.15	Dry		
Karn Lined Impoundment						
OW-10	1311		7.18	Dry		
OW-11	0946		22.30	25.67		
OW-12	0949		17.10	27.87		
Background						
MW-15002	0631		7.04	16.80		
MW-15008	0637		4.75	17.40		
MW-15016	0942		4.80	8.10		
MW-15019	0635		5.62	16.87		
DEK MW 22006	0932		9.15	17.00		
DEKMW 22003	0924		10.75	24.40		
DEKMW 22004	0926		9.63	22.44		
DEKMW 22002	0927		11.34	26.87		
DEKMW 22001	0929		9.94	24.00		
DEKMW 22005	0931		8.97	20.30		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

10/7/22
SIGNED DATE

10-14-22
CHECKED DATE

REVISED 04/2019

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~LF~~: 2022 GW Compl Background	PREPARED		CHECKED	
PROJECT NUMBER:	464096000[illegible].0000	BY: AW, JJ, JK	DATE: 10/9/22	BY: SK	DATE: 10-14-22

SAMPLE ID: MW-15008 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1448	DATE: 10/9/22	SAMPLE	TIME: 1508	DATE: 10/9/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 6.71 SU	CONDUCTIVITY: 1474 umhos/cm	
			ORP: -93.0 mV	DO: 0.8 mg/L	
DEPTH TO WATER: 4.76 T/ PVC			TURBIDITY: 1.64 NTU		
DEPTH TO BOTTOM: 17.42 T/ PVC			☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME: NA ☐ LITERS ☐ GALLONS			TEMPERATURE: 15.6 °C	OTHER: -	
VOLUME REMOVED: 4.0 ☒ LITERS ☐ GALLONS			COLOR: Clear	ODOR: None	
COLOR: Clear	ODOR: None		FILTRATE (0.45 um) ☐ YES ☒ NO		
TURBIDITY			FILTRATE COLOR:	FILTRATE ODOR:	
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☒ DUP- Background	
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1448	200	6.74	1532	-99.4	3.3	9.36	15.8	4.76	INITIAL
1453	|	6.69	1500	-92.7	1.0	2.75	15.7	4.78	1.0
1458	|	6.71	1457	-92.5	0.9	2.45	15.7	|	2.0
1503	|	6.71	1462	-92.8	0.8	2.09	15.7	|	3.0
1508	|	6.71	1474	-93.0	0.8	1.64	15.6	|	4.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1000	Plastic	B	☐ Y ☒ N					☐ Y ☐ N
2	250	|	A	☐ Y ☒ N					☐ Y ☐ N
2	125	|	B	☐ Y ☒ N					☐ Y ☐ N
2	125	|	A	☐ Y ☒ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/5/22	AIRBILL NUMBER:	-
COC NUMBER:	-	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC WATER SAMPLE LOG

~~Few~~ Background

PROJECT NAME:	CEC ~~Karn LF~~ 2022 GW Comp	PREPARED		CHECKED	
PROJECT NUMBER:	464096.0001.0000	BY: AW JJ, JK	DATE: 10/4/22	BY: JK	DATE: 10-14-22

SAMPLE ID: MW-150 19 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1550	DATE: 10/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 5.72 T/ PVC

DEPTH TO BOTTOM: 16.90 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1610	DATE: 10/4/22

PH: 6.77 SU CONDUCTIVITY: 1961 umhos/cm

ORP: -88.2 mV DO: 0.8 mg/L

TURBIDITY: 0.88 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.8 °C OTHER: —

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☐ YES ☐ NO

FILTRATE COLOR: FILTRATE ODOR:

QC SAMPLE: ☐ MS/MSD ☒ DUP- Background

COMMENTS: Radium dup

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1550	200	6.77	1961	-70.1	1.7	1.88	15.9	5.72	INITIAL
1555	|	6.76	1963	-79.5	1.1	1.62	15.8	5.78	1.0
1600	|	6.77	1965	-85.1	0.9	2.12	15.8	|	2.0
1605	|	6.77	1966	-86.9	0.9	1.45	15.8	|	3.0
1610	|	6.77	1961	-88.2	0.8	0.88	15.8	|	4.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	1000	Plastic	B	☐ Y ☒ N					☐ Y ☐ N
1	250	|	A	☐ Y ☒ N					☐ Y ☐ N
1	125	|	A	☐ Y ☒ N					☐ Y ☐ N
1	125	|	B	☐ Y ☒ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/5/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~BAP/EL~~ 2022 GW C background	PREPARED		CHECKED	
PROJECT NUMBER:	464096**0**0001.0000	BY: AW, JK, JJ	DATE: 10/5/22	BY: JK	DATE: 10-14-22

SAMPLE ID: MW-1500Z — WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 750	DATE: 10/5/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 7.13 T/ PVC

DEPTH TO BOTTOM: 16.90 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 11.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 855	DATE: 10/5/22

PH: 6.69 SU — CONDUCTIVITY: 4577 umhos/cm

ORP: -66.7 mV — DO: 0.9 mg/L

TURBIDITY: 1.98 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.9 °C — OTHER: —

COLOR: Clear — ODOR: None

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: — FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☐ DUP- —

COMMENTS: FB - Background

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0750	200	6.48	786	32.2	1.9	17.6	14.0	7.13	INITIAL
0755		6.86	832	-33.8	1.2	2.92	14.4	7.30	1.0
800		7.01	848	-65.5	1.1	3.28	14.5	7.35	2.0
805		7.08	860	-81.8	1.0	2.12	14.5		3.0
810		7.10	865	-89.5	1.0	2.73	14.5		4.0
815		7.11	1400	-91.6	0.9	2.61	14.6		5.0
820		6.77	2950	-78.3	0.9	2.14	14.7		6.0
825		6.69	4630	-75.8	0.9	2.97	14.7		7.0
830		6.69	5070	-76.1	0.9	2.06	14.7		8.0
* 835		Recalibrate	Conductivity						

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	1000	Plastic	B	☐ Y ☒ N					☐ Y ☐ N
2	125		B	☐ Y ☒ N					☐ Y ☐ N
2	125		A	☐ Y ☒ N					☐ Y ☐ N
1	250		A	☐ Y ☒ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/5/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC **WATER SAMPLE LOG** (CONTINUED FROM PREVIOUS PAGE)

PROJECT NAME:	CEC Karn ~~LF~~ 2022 GW Compli Background	PREPARED		CHECKED	
PROJECT NUMBER:	464096.0000.0000	BY: (AW) JJ, JK	DATE: 10/8/22	BY: JK	DATE: 10-14-22

SAMPLE ID: MW-15002

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR (L))
845	200	6.67	4496	-60.3	1.0	2.26	14.8	7.35	9.0
850	"	6.68	4540	-64.3	0.9	2.12	14.9	"	10.0
855	"	6.69	4577	-66.7	0.9	1.98	14.9	"	11.0

SIGNATURE: A. Whaley DATE SIGNED: 10/11/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~BAP/LI~~ Background 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464096 0001.0000	BY: AW, JK, JJ	DATE: 10/5/22	BY: JK	DATE: 10-14-22

SAMPLE ID: MW-15016 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 926	DATE: 10/5/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 4.78 T/ PVC

DEPTH TO BOTTOM: 7.65 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 956	DATE: 10/5/22

PH: 6.90 SU CONDUCTIVITY: 1817 umhos/cm

ORP: 12.1 mV DO: 0.9 mg/L

TURBIDITY: 1.70 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.7 °C OTHER: —

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: — FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
926	200	7.29	1830	9.5	9.1	4.16	15.5	4.78	INITIAL
931	|	7.04	1797	22.8	2.4	3.61	15.6	5.05	1.0
936	|	6.98	1769	20.4	1.7	2.97	15.6	|	2.0
941	|	6.95	1783	16.5	1.4	2.38	15.6	|	3.0
946	|	6.91	1810	13.8	1.0	2.08	15.7	|	4.0
951	|	6.91	1815	12.6	1.0	1.85	15.7	|	5.0
956	|	6.90	1817	12.1	0.9	1.70	15.7	|	6.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1000	Plastic	B	☐ Y ☒ N					☐ Y ☐ N
1	250	|	B	☐ Y ☒ N					☐ Y ☐ N
1	125	|	A	☐ Y ☒ N					☐ Y ☐ N
1	125	|	A	☐ Y ☒ N					☐ Y ☐ N
				☐ Y ☐ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/5/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC WATER SAMPLE LOG

BAP

PROJECT NAME:	CEC Karn~~LF~~ 2022 GW Comp	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0000.0000	BY: (AW) JJ, JK	DATE: 10/4/22	BY: SK	DATE: 10-14-22

SAMPLE ID: DEK-MW-1500Z | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0820	DATE: 10/4/22	SAMPLE	TIME: 845	DATE: 10/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 6.96 T/ PVC

DEPTH TO BOTTOM: 15.70 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 5.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.40 SU CONDUCTIVITY: 917 umhos/cm

ORP: -177.2 mV DO: 0.8 mg/L

TURBIDITY: 0.28 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.6 °C OTHER: -

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: None

QC SAMPLE: ☐ MS/MSD ☒ DUP- of DEK-BAP-01

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
820	200	6.97	853	-37.6	2.5	6.06	15.5	6.96	INITIAL
825	|	7.37	880	-120.6	1.2	6.12	15.3	7.15	1.0
830	|	7.37	935	-150.2	1.0	0.42	14.8	|	2.0
835	|	7.39	928	-169.4	0.9	0.35	14.7	|	3.0
840	|	7.40	922	-173.0	0.9	0.54	14.7	|	4.0
845	|	7.40	917	-177.2	0.8	0.28	14.6	|	5.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	40	VOA	E	☒ Y ☐ N	2	125	plastic	A	☐ Y ☒ N
4	60	VOA	A	☐ Y ☒ N	2	250	|	A	☐ Y ☒ N
2	125	plastic	B	☐ Y ☒ N	2	1000	plastic	B	☐ Y ☒ N
2	125	|	C	☐ Y ☒ N					☐ Y ☐ N
2	125	|	D	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/4/22	AIRBILL NUMBER:	-
COC NUMBER:	-	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC WATER SAMPLE LOG

BAP

PROJECT NAME:	CEC Karn LF: 2022 GW Compl	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0000.0000	BY: AW, JJ, JK	DATE: 10/4/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DEK-MW-15005 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1035	DATE: 10/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.70 T/ PVC

DEPTH TO BOTTOM: 22.30 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1055	DATE: 10/4/22

PH: 7.49 SU CONDUCTIVITY: 1330 umhos/cm

ORP: -143.8 mV DO: 0.9 mg/L

TURBIDITY: 0.86 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 14.4 °C OTHER: —

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: None

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS: FB - DEK - BAP

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1035	200	7.52	1282	-109.2	2.0	2.25	14.4	9.70	INITIAL
1040	|	7.99	1343	-132.1	1.1	2.54	14.2	9.83	1.0
1045	|	7.49	1350	-135.2	1.1	1.90	14.3	|	2.0
1050	|	7.50	1327	-140.1	0.9	2.15	14.3	|	3.0
1055	|	7.49	1330	-143.8	0.9	0.86	14.4	|	4.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1000	plastic	B	☐ Y ☒ N	2	125	B	plastic	☐ Y ☒ N
4	40	VOA	E	☒ Y ☐ N	2	|	C	|	☐ Y ☒ N
2	60	VOA	A	☐ Y ☒ N	2	|	D	|	☐ Y ☒ N
2	125	plastic	A	☐ Y ☒ N					☐ Y ☐ N
1	250	plastic	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/4/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC WATER SAMPLE LOG

BAP

PROJECT NAME:	CEC Karn LF: 2022 GW Comp	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0000.0000	BY: AW JJ, JK	DATE: 10/4/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DEK-MW-15006 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 927	DATE: 10/4/22	SAMPLE	TIME: 947	DATE: 10/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.22 T/ PVC

DEPTH TO BOTTOM: 21.50 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.77 SU CONDUCTIVITY: 966 umhos/cm

ORP: -169.9 mV DO: 0.9 mg/L

TURBIDITY: 1.89 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.9 °C OTHER: —

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: None

QC SAMPLE: ☐ MS/MSD ☒ DUP- ~~01~~ DEK-BAP-01

COMMENTS: Radium duplicate

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
927	200	7.68	933	-163.1	1.6	2.63	13.8	9.22	INITIAL
932	|	7.75	946	-166.2	1.2	1.85	13.8	9.26	1.0
937	|	7.76	948	-167.5	1.0	1.91	13.8	|	2.0
942	|	7.77	960	-168.6	0.9	2.53	13.8	|	3.0
947	|	7.77	966	-169.9	0.9	1.89	13.9	|	4.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	60	VOA	A	☐ Y ☒ N	1	125	Plastic	A	☐ Y ☒ N
2	40	VOA	E	☒ Y ☐ N	1	250	|	A	☐ Y ☒ N
1	125	plastic	B	☐ Y ☒ N	4	1000	B	B	☐ Y ☒ N
1	|	|	C	☐ Y ☒ N					☐ Y ☐ N
1			D	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/4/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 10-4-22	BY: AW	DATE: 10/20/22

SAMPLE ID: Ow-10 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1137	DATE: 10-4-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 7.16 T/ PVC

DEPTH TO BOTTOM: 17.91 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 3.0 ☒ LITERS ☐ GALLONS

COLOR: clear ODOR: none

TURBIDITY

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1210	DATE: 10-4-22

PH: 7.14 SU CONDUCTIVITY: 838 umhos/cm

ORP: -226.9 mV DO: 0.12 mg/L

TURBIDITY: 9.09 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.8 °C OTHER: —

COLOR: clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP- _____

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1140	100	7.24	885	-179.4	3.26	10.77	16.0	7.61	INITIAL
1145	100	7.05	878	-189.7	0.74	26.50	15.4	7.81	.5
1150	100	7.10	853	-211.8	0.26	27.96	15.6	7.85	1.0
1155	100	7.13	849	-220.2	0.22	15.75	15.6	7.85	1.5
1200	100	7.13	844	-223.1	0.17	10.00	15.7	7.85	2.0
1205	100	7.13	840	-225.4	0.12	9.89	15.7	7.85	2.5
1210	100	7.14	838	-226.9	0.12	9.09	15.8	7.85	3.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plast.	A	☐ Y ☒ N	2	1L	Plastic	B	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			D	☐ Y ☒ N	2	60mL		A	☐ Y ☒ N
1	250mL		A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	10-4-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	10-14-22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~LF~~ LI: 2022 GW Compl	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0000.0000	BY: AW JJ, JK	DATE: 10/4/22	BY: JK	DATE: 10-14-22

SAMPLE ID: OW-11 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1310	DATE: 10/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 22.20 T/ PVC

DEPTH TO BOTTOM: 25.20 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 8.0 ☒ LITERS ☐ GALLONS

COLOR: Clear - gray tint ODOR: None

TURBIDITY: ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1350	DATE: 10/4/22

PH: 9.61 SU | CONDUCTIVITY: 374.6 umhos/cm

ORP: -45.1 mV | DO: 1.6 mg/L

TURBIDITY: ~~42.5~~ NTU 6.92

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.7 °C | OTHER:

COLOR: gray tint | ODOR: None

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear | FILTRATE ODOR: None

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1310	200	9.53	387.1	-22.1	3.2	949	14.1	22.20	INITIAL
1315		9.45	402.8	-23.6	5.5	102	14.5	22.90	1.0
1320		9.56	383.5	-27.5	2.4	34	14.1	23.22	2.0
1325		9.67	377.3	-33.7	2.2	41	14.0	23.28	3.0
1330		9.65	382.8	-37.6	2.7	43	14.8		4.0
1335		9.63	377.1	-37.4	2.0	46.9	13.9		5.0
1340		9.65	374.8	-41.2	1.5	44.9	13.8		6.0
1345		9.63	377.8	-44.1	1.5	41.8	13.8		7.0
1350		9.61	374.6	-45.1	1.6	42.5	13.7		8.0
1355						9.10 *	7.29 * NTU	6.92 * ORP	

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1000	plastic	B	☐ Y ☒ N	1	125	plastic	D	☐ Y ☒ N
1	250		A	☐ Y ☒ N	2	60	VOA	A	☐ Y ☒ N
1	125		A	☐ Y ☒ N	2	40	VOA	E	☒ Y ☐ N
1	125		B	☐ Y ☒ N					☐ Y ☐ N
1	125		C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/4/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

* sediment in YSI affecting readings took readings before YSI with separate meter 5 min. apart

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 10-4-22	BY: AW	DATE 10-20-22

SAMPLE ID: OW-12 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1033	DATE: 10-4-22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER	
DEPTH TO WATER:	17.28 T/ PVC	
DEPTH TO BOTTOM:	23.42 T/ PVC	
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS	
VOLUME REMOVED:	4 ☒ LITERS ☐ GALLONS	
COLOR:	clear	ODOR: none
TURBIDITY	☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER	

SAMPLE	TIME: 1055	DATE: 10-4-22
PH:	7.17 SU	CONDUCTIVITY: 757 umhos/cm
ORP:	-189.5 mV	DO: 0.10 mg/L
TURBIDITY:	2.59 NTU	
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE:	17.2 °C	OTHER: —
COLOR:	clear	ODOR: none
FILTRATE (0.45 um)	☒ YES ☐ NO	
FILTRATE COLOR:	clear	FILTRATE ODOR: none
QC SAMPLE:	☐ MS/MSD ☒ DUP- KLI	
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1035	200	7.29	736	-190.5	2.99	13.23	16.5	17.33	INITIAL
1040	200	7.19	721	-188.0	0.41	8.42	16.9	17.33	1
1045	200	7.18	743	-187.0	0.12	3.97	17.1	17.33	2
1050	200	7.17	755	-188.9	0.11	2.88	17.1	17.33	3
1055	200	7.17	757	-189.5	0.10	2.59	17.2	17.33	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	Plastic	A	☐ Y ☒ N	~~4~~	1L	Plastic	B	☐ Y ☒ N
2	↓	↓	B	☐ Y ☒ N	2	40mL	VOA	E	☒ Y ☐ N
2			C	☐ Y ☒ N	2	40mL	↓	E	☐ Y ☒ N
2			D	☐ Y ☒ N	~~4~~	60mL	↓	A	☐ Y ☒ N
2	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	10-4-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	10-14-22

REVISED 04/2019

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~LF~~ BAPLF: 2022 GW Comp	PREPARED	CHECKED
PROJECT NUMBER:	464095.~~0000~~ 0001 0000	BY: AW, JJ, JK DATE: 10-4-22	BY: AW DATE: 10-20-22

SAMPLE ID: DEK-MW-15003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1303	DATE: 10-4-22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 17.00 T/ PVC

DEPTH TO BOTTOM: 27.98 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 1336	DATE: 10-4-22

PH: 8.32 SU CONDUCTIVITY: 441.1 umhos/cm

ORP: -231.3 mV DO: 0.24 mg/L

TURBIDITY: 2.45 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 22.5 °C OTHER: —

COLOR: Clear ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS: Field Blank Collected

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1306	200	8.72	439.7	-196.4	2.78	4.32	23.0	17.92	INITIAL
1311	200	8.62	429.0	-234.8	0.67	2.73	22.6	18.83	1
1316	200	8.54	433.7	-229.1	0.60	2.58	22.9	18.86	2
1321	200	8.48	435.5	-227.9	0.46	2.49	22.8	18.86	3
1326	200	8.42	436.6	-228.2	0.36	2.51	22.6	18.86	4
1331	200	8.36	437.7	-229.2	0.28	2.45	22.4	18.86	5
1336	200	8.32	441.1	-231.3	0.24	2.45	22.5	18.86	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125mL	Plastic	A	☐ Y ☒ N	2	1L	plastic	B	☐ Y ☒ N
2	↓	↓	B	☐ Y ☒ N	2	40mL	VOA	E	☒ Y ☐ N
2			C	☐ Y ☒ N	2	40mL	↓	E	☐ Y ☒ N
2			D	☐ Y ☒ N	2	60mL		A	☐ Y ☒ N
1	250mL		A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	10-4-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	10-14-22

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, (JK) JJ	DATE: 10-4-22	BY: AW	DATE 10/20/22

SAMPLE ID: KLI PCS — WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: —	DATE: —

PURGE METHOD: ☑ ~~PUMP~~ ~~PERISTALTIC PUMP~~ ☐ ~~BAILER~~

DEPTH TO WATER: NA T/ PVC

DEPTH TO BOTTOM: NA T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: NM ☐ LITERS ☐ GALLONS

COLOR: Slightly gray ODOR: none

TURBIDITY

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0915	DATE: 10-4-22

PH: 7.90 SU — CONDUCTIVITY: 667 umhos/cm

ORP: 42.7 mV — DO: 7.51 mg/L

TURBIDITY: 19.55 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 18.5 °C — OTHER:

COLOR: slight gray — ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: clear — FILTRATE ODOR: none

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0915	NM	7.90	667	42.7	7.51	19.55	18.5	NM	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1			C	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1	↓		D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	10-4-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	10-14-22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 10-4-22	BY: AW	DATE: 10/20/22

SAMPLE ID: KLI SCS | WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~GW~~ ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☒ OTHER Secondary Collection Sump

PURGING	TIME: —	DATE: —
PURGE METHOD:	☑ PUMP ~~PERISTALTIC PUMP~~ SCS pump ☐ BAILER	
DEPTH TO WATER:	NA T/ PVC	
DEPTH TO BOTTOM:	NA T/ PVC	
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS	
VOLUME REMOVED:	NA ☐ LITERS ☐ GALLONS	
COLOR:	clear ODOR: none	
TURBIDITY	☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY	
DISPOSAL METHOD:	~~GROUND~~ ☐ DRUM ☒ OTHER	

SAMPLE	TIME: 0945	DATE: 10-4-22
PH: 7.53 SU	CONDUCTIVITY: 1785 umhos/cm	
ORP: 20.2 mV	DO: 4.58 mg/L	
TURBIDITY: 0.00 NTU		
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 20.3 °C	OTHER:	
COLOR: clear	ODOR: none	
FILTRATE (0.45 um) ☒ YES ☐ NO		
FILTRATE COLOR: clear	FILTRATE ODOR: none	
QC SAMPLE: ☐ MS/MSD	☐ DUP-	
COMMENTS: purged to PCS		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0945	NM	7.53	1788	20.2	4.58	0.00	20.3	NM	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plast.	A	☐ Y ☒ N	2	1L	Plast.	B	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	1	40mL	VOA	E	☒ Y ☐ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☐ Y ☒ N
1	↓		D	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	10-4-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	10-4-22

TRC

WATER SAMPLE LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW C	PREPARED	CHECKED
PROJECT NUMBER: 464095.0001.0000	BY: AW, JJ DATE: 10-4-22	BY: AW DATE: 10/20/22

SAMPLE ID: SW-Ditch — WELL DIAMETER: ~~2"~~ ☐ 4" ☐ 6" ☒ OTHER NA

WELL MATERIAL: ~~PVC~~ ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☒ OTHER NA

SAMPLE TYPE: ~~GW~~ ☐ WW ☒ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: —	DATE: —

PURGE METHOD: ~~PUMP~~ ~~PERISTALTIC PUMP~~ ~~BAILER~~

DEPTH TO WATER: NA T/ PVC

DEPTH TO BOTTOM: NA T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: NA ☐ LITERS ☐ GALLONS

COLOR: Slightly gray ODOR: none

TURBIDITY: ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0840	DATE: 10-4-22

PH: 8.56 SU — CONDUCTIVITY: 650 umhos/cm

ORP: 18.1 mV — DO: 8.56 mg/L

TURBIDITY: 17.76 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 19.7 °C — OTHER:

COLOR: Slight gray — ODOR: none

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: — FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0840	NA	8.56	650	18.1	8.56	17.76	19.7	NA	INITIAL

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - ____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	125mL	Plastic	A	☐ Y ☒ N	1-2	40mL	VOA	E	☐ Y ☒ N
1	↓	↓	B	☐ Y ☒ N	2	60mL	↓	A	☐ Y ☒ N
1			C	☐ Y ☒ N	1	40mL	↓	E	☒ Y ☐ N
1	↓		D	☐ Y ☒ N					☐ Y ☐ N
1	250mL	↓	A	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: Fedex	DATE SHIPPED: 10-4-22	AIRBILL NUMBER: —
COC NUMBER: —	SIGNATURE: [signature]	DATE SIGNED: 10-14-22

TRC BAP/LI

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn ~~EF~~: 2022 GW Compl	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0000.0000	BY: AW JJ, JK	DATE: 10/4/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DEK-MW-18001 WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1143	DATE: 10/4/22	SAMPLE	TIME: 1203	DATE: 10/4/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 8.97 T/ PVC

DEPTH TO BOTTOM: 19.65 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4.0 ☒ LITERS ☐ GALLONS

COLOR: Clear ODOR: None

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.57 SU CONDUCTIVITY: 811 umhos/cm

ORP: -133.4 mV DO: 1.0 mg/L

TURBIDITY: 1.23 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 15.1 °C OTHER: —

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☒ YES ☐ NO

FILTRATE COLOR: Clear FILTRATE ODOR: None

QC SAMPLE: ☒ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
1143	200	7.69	835	-109.6	3.0	1.79	15.9	8.97	INITIAL
1148	|	7.59	817	-124.8	1.4	1.58	15.1	9.07	1.0
1153	|	7.57	815	-129.7	1.2	0.56	15.3	|	2.0
1158	|	7.57	812	-131.6	1.1	1.53	15.1	|	3.0
1203	|	7.57	811	-133.4	1.0	1.23	15.1	|	4.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1000	plastic	B	☐ Y ☒ N	3	P25	plastic	D	☐ Y ☒ N
1	250	|	A	☐ Y ☒ N	6	60	VOA	A	☐ Y ☒ N
3	125	|	A	☐ Y ☒ N	6	40	VOA	E	☒ Y ☐ N
3	125	|	B	☐ Y ☒ N					☐ Y ☐ N
3	125	|	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fed EX	DATE SHIPPED:	10/4/22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	AW	DATE SIGNED:	10/11/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, (JJ)	DATE: 10/7/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DEKMW-1S004 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0935	DATE: 10/6/22	SAMPLE	TIME: 0947	DATE: 10/6/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.37 SU	CONDUCTIVITY: 1031	umhos/cm
			ORP: -144.5 mV	DO: 0.35	mg/L
DEPTH TO WATER:	28.41 T/ PVC		TURBIDITY: 2.0	NTU	
DEPTH TO BOTTOM:	41.60 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 14.1 °C	OTHER:	
VOLUME REMOVED:	4 ☑ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Cloudy ODOR: none		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: Clear	FILTRATE ODOR: none	
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0935	200	7.61	594	-86.5	8.0	11.0	14.8	28.34	INITIAL
0940		7.35	1044	-136.0	0.90	2.7	14.5	28.60	1
0945		7.37	1041	-146.7	0.43	2.1	14.1	28.60	2
0950		7.37	1034	-144.7	0.34	2.0	14.1	28.60	3
0955		7.37	1035	-144.5	0.31	2.0	14.1	28.60	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	1L	glass	A	☐ Y ☑ N	1	1L	PL	D	☐ Y ☑ N
1	250	PL	A	☐ Y ☒ N	1	4oz	VOC	E	☐ Y ☒ N
1	1L	PL	A	☐ Y ☒ N	1	4oz	VOC	E	☒ Y ☐ N
1	1L	PL	B	☐ Y ☑ N					☐ Y ☐ N
1	1L	PL	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	lab Drop off	DATE SHIPPED:	10-6-22	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	10/7/22

TRC WATER SAMPLE LOG

PROJECT NAME: CEC Karn BAP/LI: 2022 GW C	PREPARED	CHECKED
PROJECT NUMBER: 464095.0001.0000	BY: AW, JK, (JJ) DATE: 10/7/22	BY: JK DATE: 10-14-22

SAMPLE ID: DFKMW 22001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0813	DATE: 10/6/22

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.94 T/ PVC

DEPTH TO BOTTOM: 24.00 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 6 ☒ LITERS ☐ GALLONS

COLOR: Brown ODOR: non

TURBIDITY

☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

SAMPLE	TIME: 0843	DATE: 10/6/22

PH: 7.31 SU CONDUCTIVITY: 1434 umhos/cm

ORP: -144.8 mV DO: 0.10 mg/L

TURBIDITY: 7.0 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.1 °C OTHER:

COLOR: clear ODOR: non

FILTRATE (0.45 um) ☐ YES ☐ NO

FILTRATE COLOR: clear FILTRATE ODOR: non

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0813	200	7.60	800	-114.5	9.0	3000	13.8	9.96	INITIAL
0818		7.16	2034	-135.5	0.70	1500	15.0	9.97	1
0823		7.14	1991	-131.5	0.34	130	15.0	10.0	2
0828		7.24	1916	-136.0	0.20	6.8	15.0	10.0	3
0833		7.30	1869	-145.0	0.10	7.0	15.0	10.0	4
0838		7.31	1853	-145.0	0.10	7.0	15.0	10.0	5
0843		7.31	1434	-144.8	0.10	7.0	15.1	10.0	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
3	125	Glass	A	☐ Y ☒ N	1	125	PL	D	☐ Y ☒ N
1	250	PL	A	☐ Y ☒ N	1	40	VOC	E	☐ Y ☒ N
1	125	PL	A	☐ Y ☒ N	1	40	VOC	E	☒ Y ☐ N
1	125	PL	B	☐ Y ☒ N					☐ Y ☐ N
1	125	PL	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD: lab drop off	DATE SHIPPED: 10-6-22	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: 10/7/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 10/7/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DEK22008 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0727	DATE: 10/6/22	SAMPLE	TIME: 0757	DATE: 10/6/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.45 SU	CONDUCTIVITY: 1304	umhos/cm
			ORP: -165.8 mV	DO: 0.10	mg/L
DEPTH TO WATER:	11.34 T/ PVC		TURBIDITY: 7.9 NTU		
DEPTH TO BOTTOM:	26.85 T/ PVC		☐ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 14.4 °C	OTHER:	
VOLUME REMOVED:	6.0 ☑ LITERS ☐ GALLONS		COLOR: Clear	ODOR: non	
COLOR:	orange ODOR: non		FILTRATE (0.45 um) ☐ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: Clear	FILTRATE ODOR: non	
☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY			QC SAMPLE: ☐ MS/MSD ☐ DUP-		
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0727	200	7.73	1616	-154.5	9.6	1300	14.1	11.28	INITIAL
0732		7.45	1340	-166.5	0.54	47	14.4	11.32	1
0737		7.45	1325	-165.5	0.38	11.0	14.4	11.42	2
0742		7.45	1311	-166.1	0.23	11.0	14.4	11.12	3
0747		7.45	1313	-166.0	0.16	7.6	14.4	11.15	4
0752		7.45	1310	-165.8	0.10	8.0	14.4	11.15	5
0757		7.45	1304	-165.8	0.10	7.9	14.4	11.15	6
~~0802~~									7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☑ N	1	125	PL	D	☐ Y ☑ N
1	250	PL	A	☐ Y ☑ N	1	40	VOC	E	☐ Y ☑ N
1	125	PL	A	☐ Y ☑ N	1	40	VOC	E	☑ Y ☐ N
1	125	PL	B	☐ Y ☑ N					☐ Y ☐ N
1	125	PL	B	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD:	lab drop off	DATE SHIPPED:	10-6-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	10/7/22

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 10/7/22	BY: SK	DATE: 10-14-22

SAMPLE ID: DFKMW 23003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0558	DATE: 10/6/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER	
DEPTH TO WATER:	10.71 T/ PVC	
DEPTH TO BOTTOM:	24.46 T/ PVC	
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS	
VOLUME REMOVED:	6 ☐ LITERS ☐ GALLONS	
COLOR:	Brown ODOR: NOR	
TURBIDITY	☐ NONE ☐ SLIGHT ☐ MODERATE ☑ VERY	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER	

SAMPLE	TIME: 0638	DATE: 10/6/22
PH: 7.60 SU	CONDUCTIVITY: 768 umhos/cm	
ORP: -160.5 mV	DO: 0.11 mg/L	
TURBIDITY: 5.5 NTU		
☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 14.4 °C	OTHER:	
COLOR: Clear	ODOR: NOR	
FILTRATE (0.45 um) ☒ YES ☐ NO		
FILTRATE COLOR: Clear	FILTRATE ODOR: NOR	
QC SAMPLE: ☐ MS/MSD	☐ DUP-	
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0558	200	8.00	547	-181.0	9.0	600	14.7	10.68	INITIAL
0603		7.64	1038	-176.1	0.90	75.0	14.4	1071	1
0608		7.67	820	-160.0	0.25	12.5	14.3	1071	2
0613		7.60	753	-155	0.13	7	14.4	1071	3
0618		7.60	767	-160.0	0.10	5.8	14.5	1072	4
0623		7.60	765	-160.5	0.10	5.7	14.4	1073	5
0628		7.60	768	-160.5	0.11	5.5	14.4	1073	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
3	1L	glass	A	☐ Y ☑ N	1	40	VOC	E	☐ Y ☑ N
1	250	P	A	☐ Y ☒ N	1	4C	VOC	F	☒ Y ☐ N
1	1L	P	A	☐ Y ☒ N	1	1L	P	D	☐ Y ☒ N
1	1L	P	B	☐ Y ☒ N					☐ Y ☐ N
1	1L	P	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	10-6-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	10/7/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 10/7/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DFKMW 22004 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0647	DATE: 10/6/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER	
DEPTH TO WATER:	9.83 T/ PVC	
DEPTH TO BOTTOM:	22.46 T/ PVC	
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS	
VOLUME REMOVED:	5 ☒ LITERS ☐ GALLONS	
COLOR:	Brown	ODOR: non
TURBIDITY	☐ NONE ☐ SLIGHT ☐ MODERATE ☒ VERY	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER	

SAMPLE	TIME: 0710	DATE: 10/6/22
PH: 7.64 SU	CONDUCTIVITY: 900 umhos/cm	
ORP: -154.9 mV	DO: 0.10 mg/L	
TURBIDITY: 3.7 NTU		
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 15.3 °C	OTHER:	
COLOR: Clear	ODOR: non	
FILTRATE (0.45 um) ☒ YES ☐ NO		
FILTRATE COLOR: Clear	FILTRATE ODOR: non	
QC SAMPLE: ☐ MS/MSD	☐ DUP-	
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0647	200	7.71	549	-120.1	0.10	17.0	14.6	9.73	INITIAL
0650		7.63	967	-150	0.44	20.5	15.0	9.83	1
0655		7.64	928	-152.5	0.24	5.0	15.1	9.83	2
0700		7.64	904	-154.8	0.11	3.6	15.1	9.83	3
0705		7.64	904	-154.8	0.10	3.2	15.3	9.83	4
0710		7.64	900	-154.9	0.10	3.7	15.3	9.83	5
~~0715~~									~~6~~

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED | PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☒ N	1	125	PL	D	☐ Y ☒ N
1	250	PL	A	☐ Y ☐ N	1	40	VOC	E	☐ Y ☒ N
1	125	PL	A	☐ Y ☒ N	1	40	VOC	E	☒ Y ☐ N
1	125	PL	B	☐ Y ☒ N					☐ Y ☐ N
1	125	PL	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	lab drop off	DATE SHIPPED:	10-6-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	10/7/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, (JJ)	DATE: 10/7/22	BY: SK	DATE: 10-14-22

SAMPLE ID: DEKMW 23001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0896	DATE: 10/6/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER	
DEPTH TO WATER:	8.57 T/ PVC	
DEPTH TO BOTTOM:	20.70 T/ PVC	
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS	
VOLUME REMOVED:	4 ☒ LITERS ☐ GALLONS	
COLOR:	clear ODOR: none	
TURBIDITY	☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY	
DISPOSAL METHOD:	☑ GROUND ☐ DRUM ☐ OTHER	

SAMPLE	TIME: 0916	DATE: 10/6/22
PH: 7.64 SU	CONDUCTIVITY: 1361 umhos/cm	
ORP: -160.1 mV	DO: 0.15 mg/L	
TURBIDITY: 2.2 NTU		
☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
TEMPERATURE: 15.7 °C	OTHER:	
COLOR: clear	ODOR: none	
FILTRATE (0.45 um) ☐ YES ☐ NO		
FILTRATE COLOR: clear	FILTRATE ODOR: none	
QC SAMPLE: ☐ MS/MSD	☐ DUP-	
COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0896	200	7.60	798	-135.7	9.0	17.0	15.1	866	INITIAL
0901		7.62	1530	-150.5	0.67	2.7	15.5	866	1
0906		7.65	1297	-159.8	0.31	2.3	15.6	866	2
0911		7.64	1270	-160.1	0.15	2.2	15.7	866	3
0916		7.64	1265	-160.5	0.15	2.2	15.7	866	4

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3 % ORP: +/- 10 D.O.: +/- 0.3 TURB: +/- 10 % or </= 10 TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	125	glass	A	☐ Y ☒ N	1	125	pl	D	☐ Y ☒ N
1	250	pl	A	☐ Y ☒ N	1	40	VOC	E	☐ Y ☒ N
1	125	pl	A	☐ Y ☒ N	1	40	VOC	E	☒ Y ☐ N
1	125	pl	B	☐ Y ☒ N					☐ Y ☐ N
1	125	pl	B	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	lab drop off	DATE SHIPPED:	10-6-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	10/7/22

TRC WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2022 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	464095.0001.0000	BY: AW, JK, JJ	DATE: 10/7/22	BY: JK	DATE: 10-14-22

SAMPLE ID: DFKMW 2206 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0507	DATE: 10/6/22	SAMPLE	TIME: 0537	DATE: 10/6/22
PURGE METHOD:	☑ PUMP PERISTALTIC PUMP ☐ BAILER		PH: 7.51 SU	CONDUCTIVITY: 2666	umhos/cm
			ORP: -164.0 mV	DO: 0.10	mg/L
DEPTH TO WATER:	4.12 T/ PVC		TURBIDITY: 2.7 NTU		
DEPTH TO BOTTOM:	17.05 T/ PVC		☑ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY		
WELL VOLUME:	NA ☐ LITERS ☐ GALLONS		TEMPERATURE: 17.0 °C	OTHER:	
VOLUME REMOVED:	6 ☑ LITERS ☐ GALLONS		COLOR: Clear	ODOR: none	
COLOR:	Cloudy ODOR: none		FILTRATE (0.45 um) ☑ YES ☐ NO		
TURBIDITY			FILTRATE COLOR: Yellow	FILTRATE ODOR: none	
☐ NONE ☐ SLIGHT ☑ MODERATE ☐ VERY			QC SAMPLE: ☐ MS/MSD	☑ DUP- #1	
DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER			COMMENTS:		

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0507	200	4.00	1338	-115.7	8.17	90	18.3	4.10	INITIAL
0510		7.44	2657	-170.0	0.78	13.7	16.6	9.25	1
0515		7.49	2639	-166.0	0.36	12.7	16.9	9.25	2
0520		7.51	2649	-166.0	0.15	13.0	17.1	9.25	3
0525		7.51	2663	-164.7	0.12	2.6	17.0	9.25	4
0530		7.51	2666	-164.0	0.10	2.8	17.0	9.25	5
0535		7.51	2666	-164.0	0.10	2.7	17.0	9.25	6

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +/-

BOTTLES FILLED — PRESERVATIVE CODES: A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
4	1000	Glass	A	☐ Y ☑ N	2	40	VOC	HCL	☐ Y ☑ N
2	250	PL	A	☐ Y ☑ N	2	40	VOC	HCL	☑ Y ☐ N
2	125	PL	A	☐ Y ☐ N	2	125	PL	D	☐ Y ☑ N
2	125	PL	B	☐ Y ☑ N					☐ Y ☐ N
2	125	PL	C	☐ Y ☑ N					☐ Y ☐ N

SHIPPING METHOD:	Lab Drop off	DATE SHIPPED:	10-6-22	AIRBILL NUMBER:	
COC NUMBER:		SIGNATURE:		DATE SIGNED:	10/7/22

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Andrew Whaley	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99536-29047.1
Client Contact: Jacob Krenz	Phone: 734-210-9239	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: 178829			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR Background Well	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D		
MW-15002	10/5/22	855	G	Water	N	N	X	X		
MW-15008	10/4/22	1508	G	Water	N	N	X	X		
MW-15016	10/5/22	956	G	Water	N	N	X	X		
MW-15019	10/4/22	1610	G	Water	N	N	X	X		
DUP-Background	10/4/22	-	G	Water	N	N	X	X		
FB-Background	10/5/22	855	G	Water	N	N	X	X		
				~~Water~~						

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	10-7-22/1016	TRC	[signature]	10/7/22 10:15	EETA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

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180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Jacob Krenz	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99544-29054.1
Client Contact: Jacob Krenz	Phone: 734-395-9804	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page of
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes:
City: Ann Arbor	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			Other:
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: 178827			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Lined Impoundment	Project #: 24024154			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:		N	N	X	X		
DEK-MW-15003	10-4-22	1336	G	Water	N	N	X	X		
OW-10	10-4-22	1210	G	Water	N	N	X	X		
OW-11	10-4-22	1350	G	Water	N	N	X	X		
OW-12	10-4-22	1055	G	Water	N	N	X	X		
KLI-SCS	10-4-22	0945	G	Water	N	N	X	X		
DUP-KLI	10-4-22	—	G	Water	N	N	X	X		
EB-KLI	10-4-22		G	Water	N	N	X	X		
				Water						

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed If samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10-7-22 1106	TRC		10/7/22 1015	ET A
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Andrew Whaley	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99542-29053.1
Client Contact: Jacob Krenz	Phone: 734-210-9239	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page of
Company: TRC Environmental Corporation.	PWSID:	Analysis Requested		Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			Preservation Codes:
City: Ann Arbor	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: 178827			Other:
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond & I	Project #: 24024154			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Special Instructions/Note:
			Preservation Code:						
DEK-MW-18001	10/4/22	1203	G	Water	N	N	X	X	
				Water					

Possible Hazard Identification
☒ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10-7-22 1016			10/7/22 10:15	EET A
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

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Eurofins Canton
180 S. Van Buren Avenue
Barberton, OH 44203
Phone (330) 497-9396 Phone (330) 497-0772

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Andrew Whaley	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99541-29052.1
Client Contact: Jacob Krenz	Phone: 734-210-9239	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page: Page of
Company: TRC Environmental Corporation.	PWSID:			Job #:
Address: 1540 Eisenhower Place	Due Date Requested:			
City: Ann Arbor	TAT Requested (days):			
State, Zip: MI, 48108-7080	Compliance Project: Δ Yes Δ No			
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO #: 178827			
Email: JKrenz@trccompanies.com	WO #:			
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond	Project #: 24024154			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0, Ra226Ra228_GFPC	904.0 - Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
DEK-MW-15002	10/4/22	845	G	Water	N	N	X	X		
DEK-MW-15005	10/4/22	1055	G	Water			X	X		
DEK-MW-15006	10/4/22	947	G	Water			X	X		
DUP-DEK-BAP-01	10/4/22	—	G	Water			X	X		
EB-DEK-BAP	10/4/22	1200	G	Water			X	X		
				Water						

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10-7-22/1016			10/7/22 10:15	EE7A
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

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CHAIN OF CUSTODY

Consumers Energy — Count on Us®

CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q4-2022 DEK Lined Impoundment

PROJECT NUMBER: 22-1018

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: TRC

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1018-01	10-4-22	1336	GW	DEK-MW-15003	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	10-4-22	1210	GW	OW-10	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	10-4-22	1350	GW	OW-11	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	10-4-22	1055	GW	OW-12	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	10-4-22	0945	W	KLI-SCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-06	10-4-22	0915	SW	KLI-PCS	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-07	10-4-22	0840	SW	SW-DITCH	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-08	10-4-22	—	GW	DUP-KLI	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-09	10-4-22	1537	W	EB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	
-10	10-4-22	1336	W	FB-KLI	6	1	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 10-4-22/1615 RECEIVED BY: FedEx

RELINQUISHED BY: FedEx DATE/TIME: 10-05-22 10:30 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 0.4-1.8 °C Cal. Due Date: 5-25-23

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CHAIN OF CUSTODY

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES

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

SAMPLING SITE / CUSTOMER: Q4-2022 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 22-1017

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: Andrew Whaley

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1017-01	10/4/22	1203	GW	DEK-MW-18001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	"	"	GW	DEK-MW-18001 MS	8	3	1	1	1	2			x	x	x		x	x	x	x	
-03	"	"	GW	DEK-MW-18001 MSD	8	3	1	1	1	2			x	x	x		x	x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 10-4-22 / 1615 RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex DATE/TIME: 10-05-22 10:30 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: 015902

Temperature 0.0-1.8 °C Cal. Due Date: 5-25-23

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SAMPLING SITE / CUSTOMER: Q4-2022 DEK Bottom Ash Pond Wells	PROJECT NUMBER: 22-1016	SAP CC or WO#:	
SAMPLING TEAM: Andrea Whaley	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER	REQUESTER: Harold Register	
SEND REPORT TO: Caleb Batts	email:	phone:	
COPY TO: Harold Register; TRC	MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other; SL = Sludge; A = Air; WP = Wipe; WT = General Waste		

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1016-01	10/4/22	845	GW	DEK-MW-15002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	10/4/22	1055	GW	DEK-MW-15005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	10/4/22	947	GW	DEK-MW-15006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	10/4/22	—	GW	DUP-DEK-BAP-01	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	10/4/22	1055	W	FB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	
-06	10/4/22	1200	W	EB-DEK-BAP	6	2	1	1	1	2			x	x	x			x	x	x	

RELINQUISHED BY:	DATE/TIME: 10-4-22 / 1615	RECEIVED BY: FedEx
RELINQUISHED BY: Fed Ex	DATE/TIME: 10-05-22 10:30	RECEIVED BY:

COMMENTS:

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

Temperature: 0.0-1.8 °C Cal. Due Date: 5-25-23

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q4-2022 JCW-DEK Background Wells

PROJECT NUMBER: 22-1023

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM: Andrew Whaley

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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
22-1023-01	10/5/22	855	GW	MW-15002	3	2	1						x	x	x	
-02	10/4/22	1508	GW	MW-15008	3	2	1						x	x	x	
-03	10/5/22	956	GW	MW-15016	3	2	1						x	x	x	
-04	10/4/22	1610	GW	MW-15019	3	2	1						x	x	x	
-05	10/4/22	—	GW	DUP-Background	3	2	1						x	x	x	
-06	10/5/22	855	W	FB- Background	1								x			

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RELINQUISHED BY: Fed Ex DATE/TIME: 10-06-22 10:30 RECEIVED BY: [signature]

COMMENTS:

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

Temperature: 36-5.1 °C Cal. Due Date: 5-25-23

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SAMPLING SITE / CUSTOMER: Q4-2022 DEK Bottom Ash Supplemental

PROJECT NUMBER: 22-1019

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

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

SEND REPORT TO: Caleb Batts — email: — phone:

COPY TO: Harold Register; TRC

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

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	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1019-01	10/6/22	0945	GW	DEK-MW-15004	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-02	"	0843	GW	DEK-MW-22001	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-03	"	0757	GW	DEK-MW-22002	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-04	"	0628	GW	DEK-MW-22003	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-05	"	0710	GW	DEK-MW-22004	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-06	"	0916	GW	DEK-MW-22005	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-07	"	0535	GW	DEK-MW-22006	9	4	1	1	1	2			x	x	x	x	x	x	x	x	
-08	"	-	GW	DUP-DEK-BAP-02	9	4	1	1	1	2			x	x	x	x	x	x	x	x	

RELINQUISHED BY: [signature] DATE/TIME: 10/6/22 1310 RECEIVED BY: [signature]

RELINQUISHED BY: DATE/TIME: RECEIVED BY:

COMMENTS:

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

Temperature: 4.1 - 5.9 °C Cal. Due Date: dmw 10.6.22 ~~5.25.23~~ 5.25.23

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Appendix C
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event October 2022
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the October 2022 sampling event. The sample was analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analysis was subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 22-1017, S41139.01, and 85178.

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

- DEK-MW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate, Nitrate, Nitrite)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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

Data Usability Review Procedure

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

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

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.
- A field blank was not collected with this data set.
- An equipment blank was not collected with this data set.
- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, ammonia, alkalinity, sulfide, TOC, and DOC. The recoveries were within the acceptance limits. Relative percent differences (RPDs) were within the acceptance limits for TOC and DOC but were not provided by the laboratory for the remaining parameters and therefore

were not evaluated; further, with the exception of sulfide, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.

- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review
Groundwater Monitoring Event October 2022
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the October 2022 sampling event. The sample was analyzed for radium by Eurofins in St. Louis, Missouri (Eurofins – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-174334-1.

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

- DEK-MW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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

Data Usability Review Procedure

The analytical data were reviewed using the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

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

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- Target analytes were not detected in the method blanks.
- No equipment or field blanks were collected.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- A field duplicate pair was not collected.
- Carrier recoveries were within 40-110%.

Laboratory Data Quality Review
Groundwater/Surface Water Monitoring Event October 2022
DE Karn Lined Impoundment

Groundwater and surface water samples were collected by TRC for the October 2022 sampling event. Samples were analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analyses were subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 22-1018, S41137.01(01), and 85182.

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

- OW-10
- OW-11
- OW-12
- DEK-MW-15003

During the October 2022 sampling event, the following water/surface water samples were collected:

- KLI-PCS
- SW-DITCH
- KLI-SCS

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

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate, Nitrate, Nitrite)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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

Data Usability Review Procedure

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

- Sample receipt, as noted in the cover page or case narrative

- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;
- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

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

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.

- One field blank (FB-KLI) and one equipment blank (EB-KLI) were collected with this data set. Target analytes were not detected in these blank samples.
- MS and MSD analyses were performed on sample OW-11 for TOC/DOC. All criteria were met.
- The field duplicate pair samples were DUP-KLI and OW-12; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The DOC result was greater than the TOC result by more than 20% for samples OW-11 and SW-DITCH and the results were >5x the RL. The positive results for DOC and TOC in these samples are potentially uncertain as summarized in the attached table, Attachment A. TOC/DOC are indicator parameters and are not used to determine compliance with the detection monitoring program.

Attachment A

Summary of Data Non-Conformances for Impoundment Groundwater and Surface Water Analytical Data

DE Karn Lined Impoundment Wells

Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
OW-11	10/4/2022	TOC/DOC	The dissolved concentration was higher than the total concentration by >20% and total and dissolved results > 5x the RL. The positive results for DOC and TOC in these samples are potentially uncertain. TOC/DOC are indicator parameters and are not used to determine compliance with the detection monitoring program.
SW-DITCH			

Laboratory Data Quality Review
Groundwater Monitoring Event October 2022
DE Karn Lined Impoundment

Groundwater samples were collected by TRC for the October 2022 sampling event. Samples were analyzed for radium by Eurofins in St. Louis, Missouri (Eurofins – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-174330-1.

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

- OW-10
- OW-11
- OW-12
- DEK-MW-15003

During the October 2022 sampling event, the following water/surface water sample was collected:

- KLI-SCS

Each sample was analyzed for the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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

Data Usability Review Procedure

The analytical data were reviewed using the Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

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

- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

This data usability report addresses the following items:

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

Review Summary

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

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

QA/QC Sample Summary

- Target analytes were not detected in the method blanks with the following exception.
  - Radium-228 was detected in MB 160-586571/1-A at 1.001 +/- 0.433 pCi/L. Detections of radium-228 in all samples are potential false positive results, as summarized in Attachment A.
- No equipment or field blanks were submitted.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were KLI-DUP/DEK-MW-15003. All criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A
Summary of Data Non-Conformances for Impoundment Groundwater and Surface Water Analytical Data
DE Karn Lined Impoundment – CCR Monitoring Program
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-15003	10/4/2022	Radium 228	Detected result is potentially a false positive due to method blank contamination.
OW-10	10/4/2022		
OW-11	10/4/2022		
OW-12	10/4/2022		
KLI-SCS	10/4/2022		
DUP-KLI	10/4/2022		

Appendix D
Statistical Analysis

Appendix D
Statistical Summary for DE Karn Lined Impoundment
Fourth Quarter 2022
Data from March 2021 to October 2022

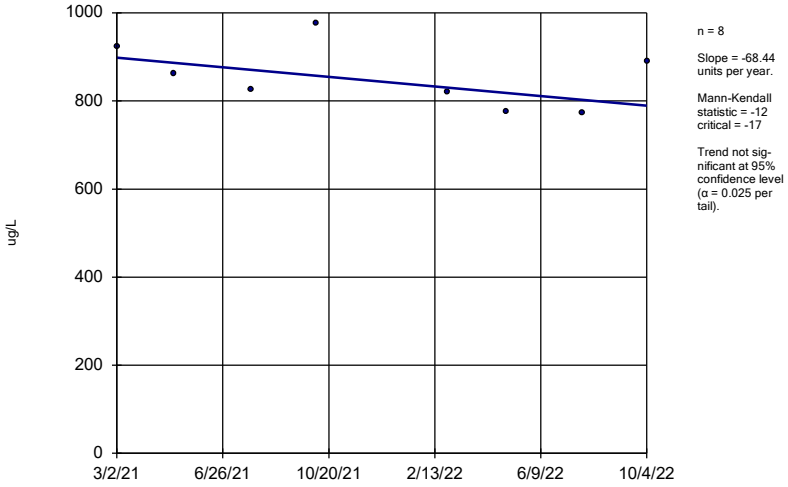
Karn Lined Impoundment Wells						
PARAMETER	**Range, Test, or Limit**	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**	**OW-11**	**OW-12**
Boron	Trend	O	O	O	O	O
Calcium	Trend	O	O	O	↓	O
Chloride	Trend	↑ ASD	O	O	↓	O
Fluoride	Trend	O*	O*	O*	O	O*
Iron	Trend	O	O	O	O	O
pH	Trend	O	O	O	↑ ASD	O
Sulfate	Trend	O	O	O	↓	O
Total Dissolved Solids	Trend	↑ ASD	O	O	O	O

Notes:

O* = Non-detect
O = No trend
↑ = Upward trend, continuous
↑* = Upward trend, new
↑ = Upward trend, confirmed
↓ = Downward trend, continuous
↓* = Downward trend, new
↑ ASD = Alternate Source Demonstration (Fourth Quarter 2022 Hydrogeological Monitoring Report for the Karn Lined Impoundment CCR Unit, TRC, January 2023.)

Boron, Total

DEK-MW-15003



n = 8

Slope = -68.44 units per year.

Mann-Kendall statistic = -12
critical = -17

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

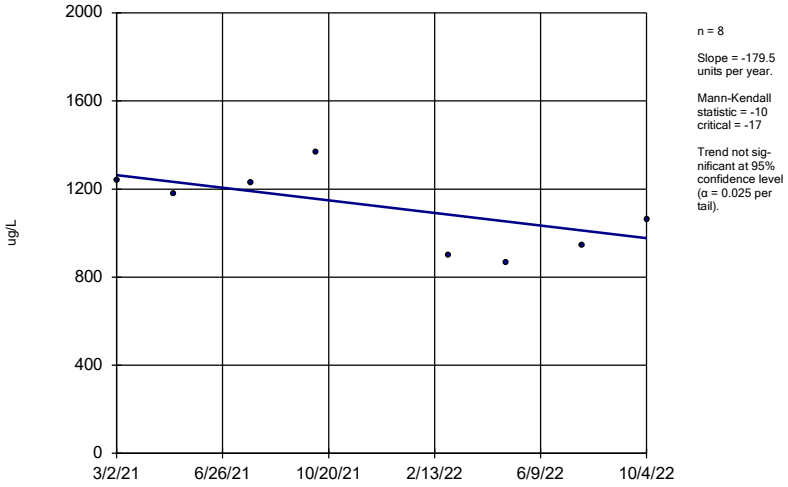
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Boron, Total

DEK-MW-18001



n = 8

Slope = -179.5 units per year.

Mann-Kendall statistic = -10
critical = -17

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

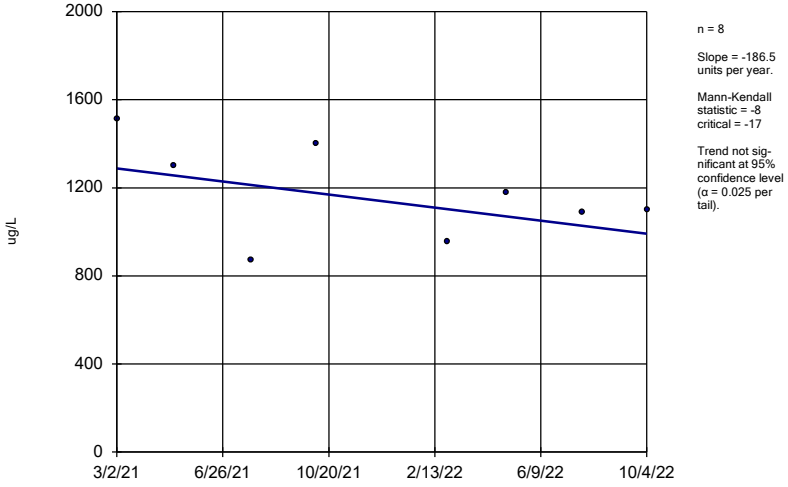
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Boron, Total

OW-10



n = 8

Slope = -186.5 units per year.

Mann-Kendall statistic = -8
critical = -17

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

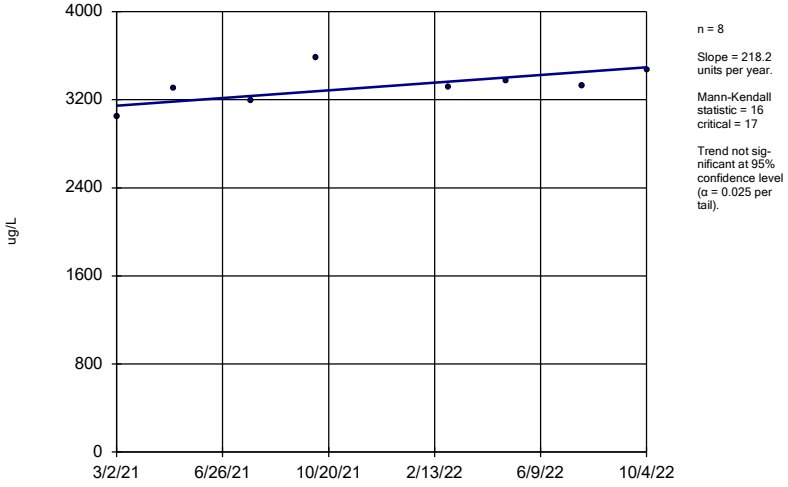
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Boron, Total

OW-11



n = 8

Slope = 218.2 units per year.

Mann-Kendall statistic = 16
critical = 17

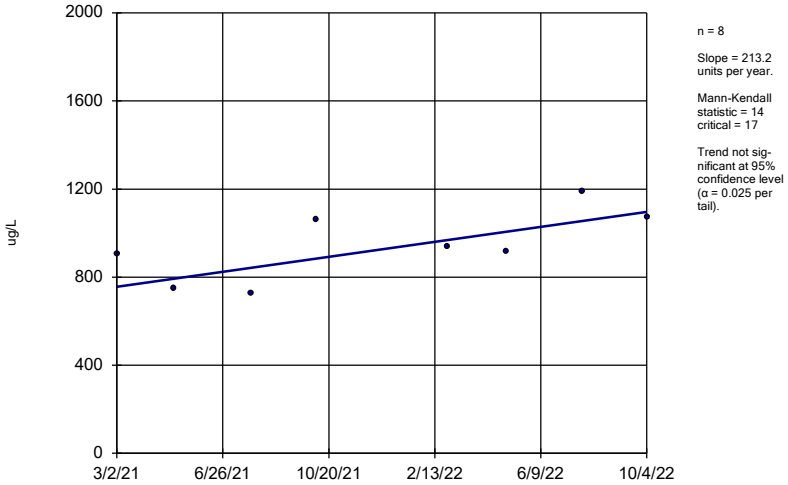
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Boron, Total

OW-12



n = 8

Slope = 213.2 units per year.

Mann-Kendall statistic = 14 critical = 17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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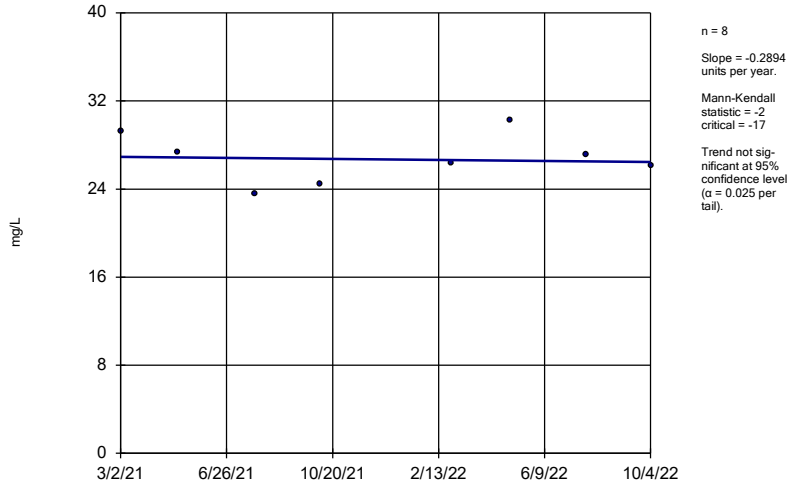
Calcium, Total

DEK-MW-15003



n = 8

Slope = -0.2894 units per year.

Mann-Kendall statistic = -2 critical = -17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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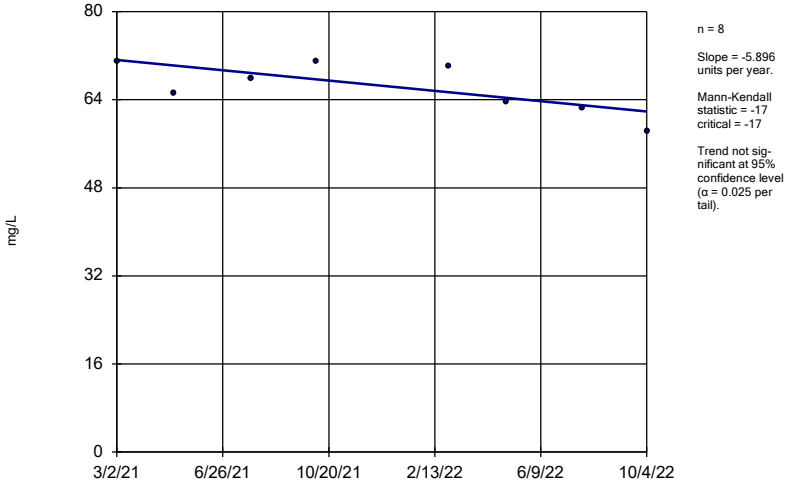
Calcium, Total

DEK-MW-18001



n = 8

Slope = -5.896 units per year.

Mann-Kendall statistic = -17 critical = -17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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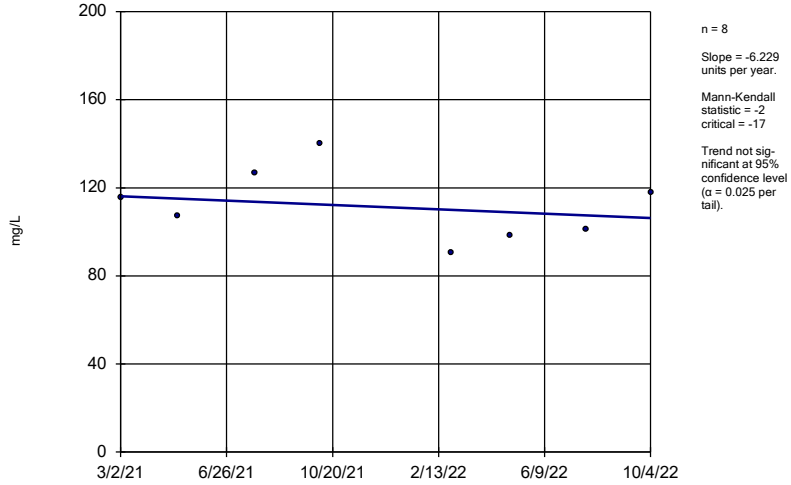
Calcium, Total

OW-10



n = 8

Slope = -6.229 units per year.

Mann-Kendall statistic = -2 critical = -17

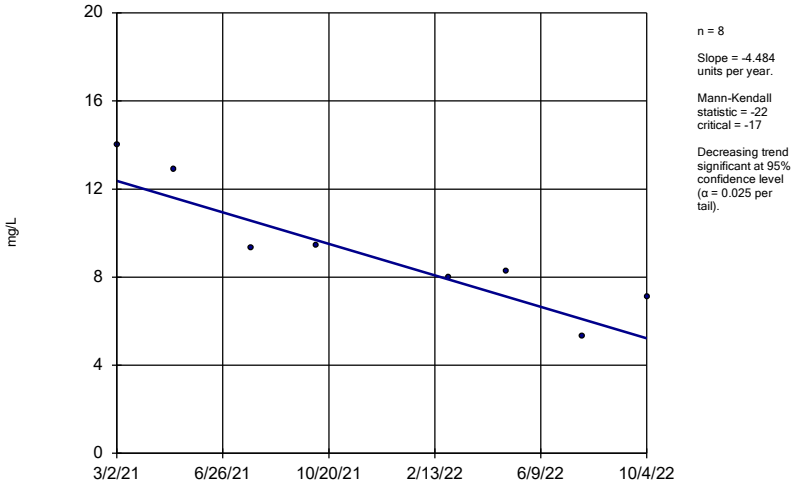
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Calcium, Total

OW-11



n = 8

Slope = -4.484 units per year.

Mann-Kendall statistic = -22
critical = -17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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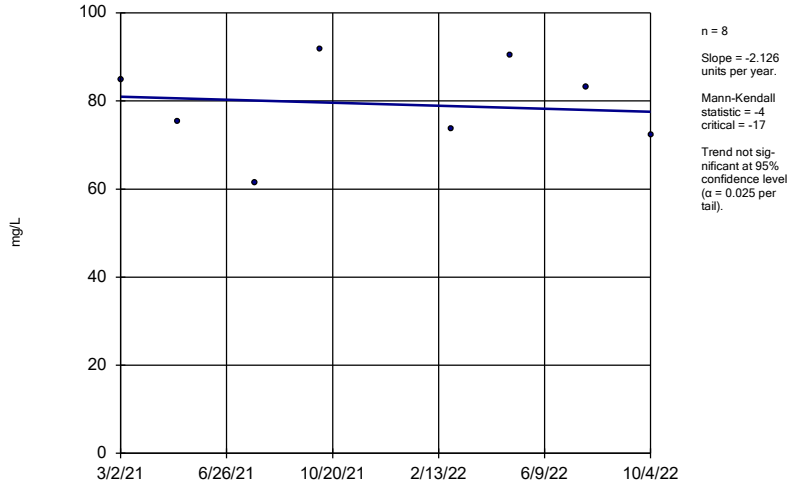
Calcium, Total

OW-12



n = 8

Slope = -2.126 units per year.

Mann-Kendall statistic = -4
critical = -17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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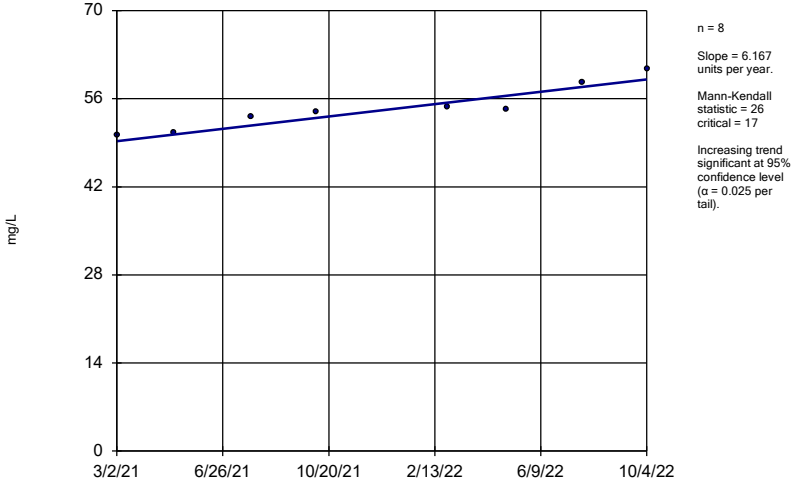
Chloride

DEK-MW-15003



n = 8

Slope = 6.167 units per year.

Mann-Kendall statistic = 26
critical = 17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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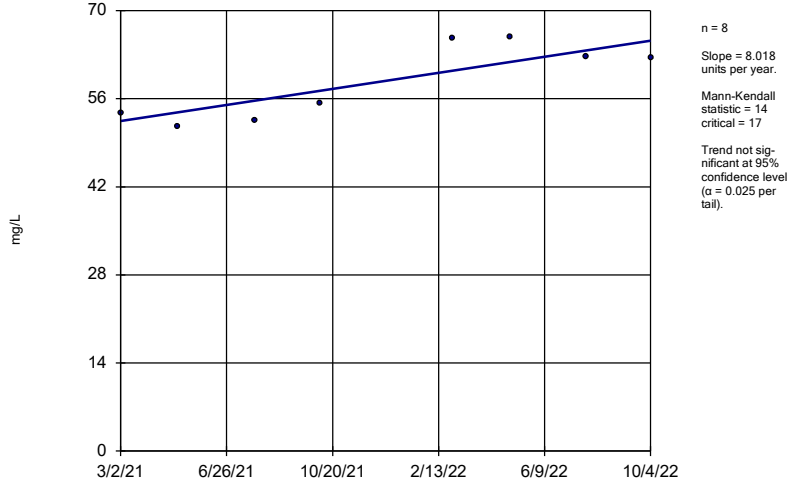
Chloride

DEK-MW-18001



n = 8

Slope = 8.018 units per year.

Mann-Kendall statistic = 14
critical = 17

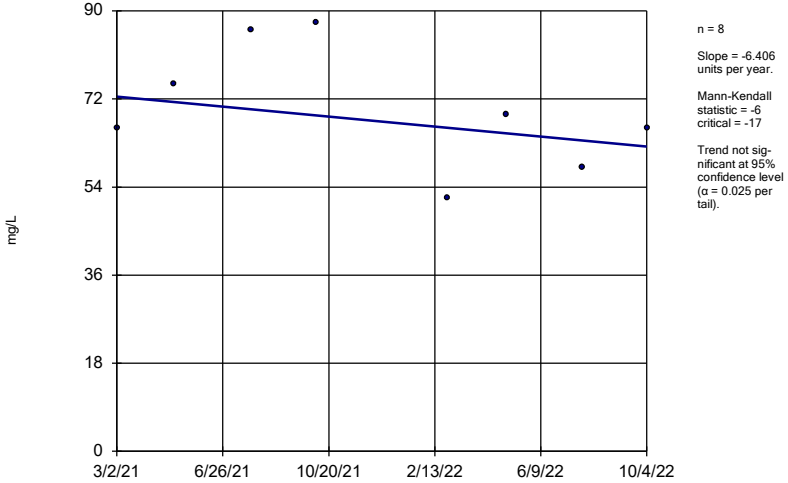
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Chloride

OW-10



n = 8

Slope = -6.406 units per year.

Mann-Kendall statistic = -6
critical = -17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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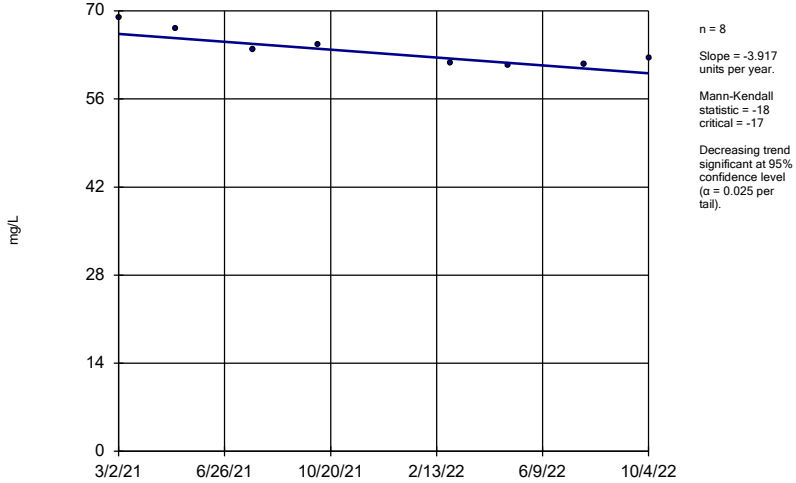
Chloride

OW-11



n = 8

Slope = -3.917 units per year.

Mann-Kendall statistic = -18
critical = -17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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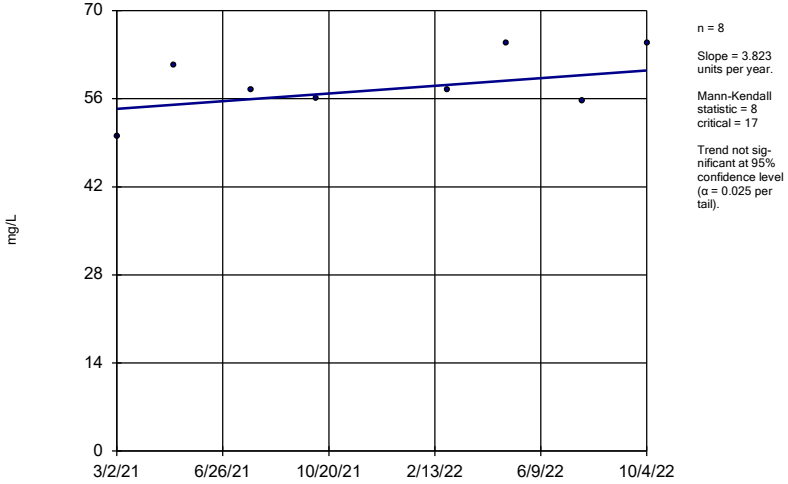
Chloride

OW-12



n = 8

Slope = 3.823 units per year.

Mann-Kendall statistic = 8
critical = 17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

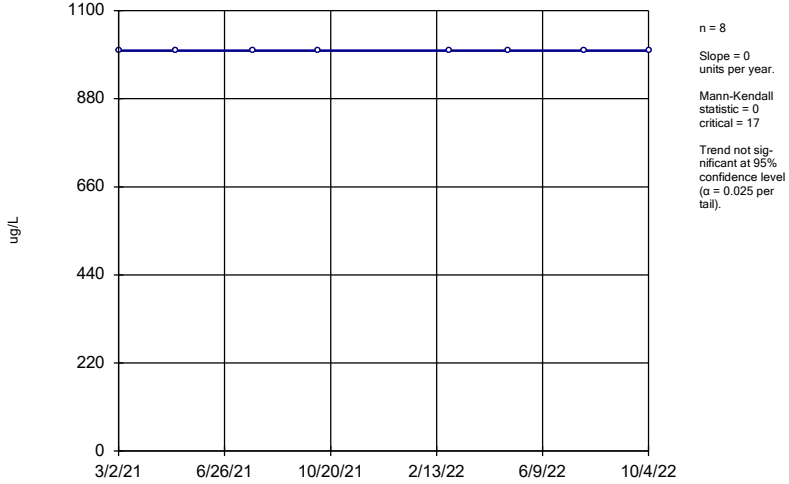
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Hollow symbols indicate censored values.

Fluoride

DEK-MW-15003



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 17

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

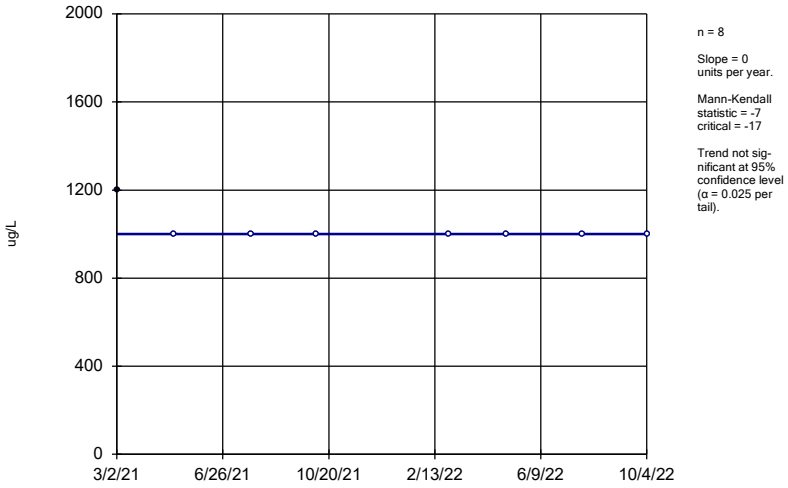
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Fluoride

DEK-MW-18001



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -7
critical = -17

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

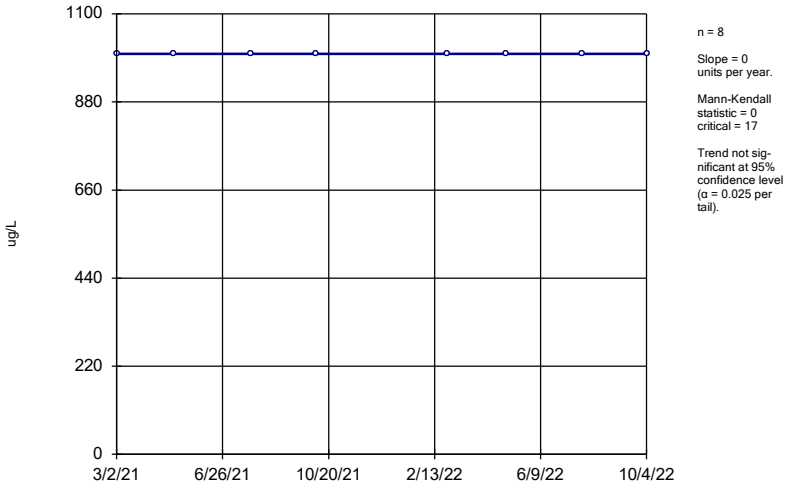
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Fluoride

OW-10



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 17

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

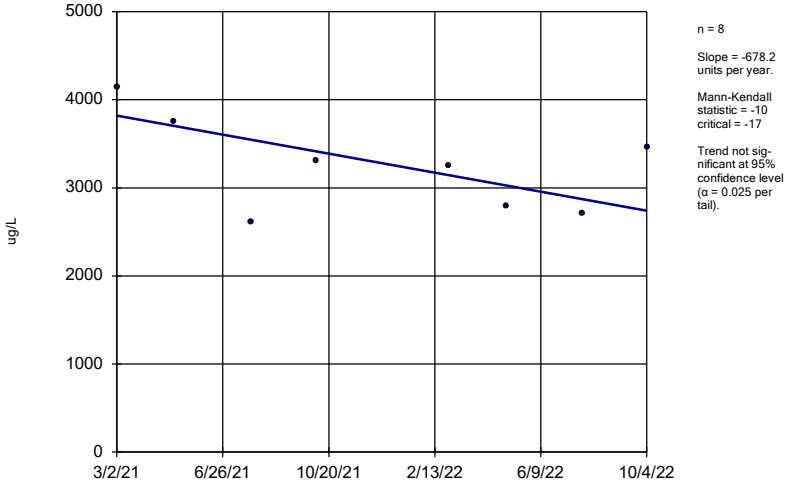
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Fluoride

OW-11



n = 8

Slope = -678.2 units per year.

Mann-Kendall statistic = -10
critical = -17

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

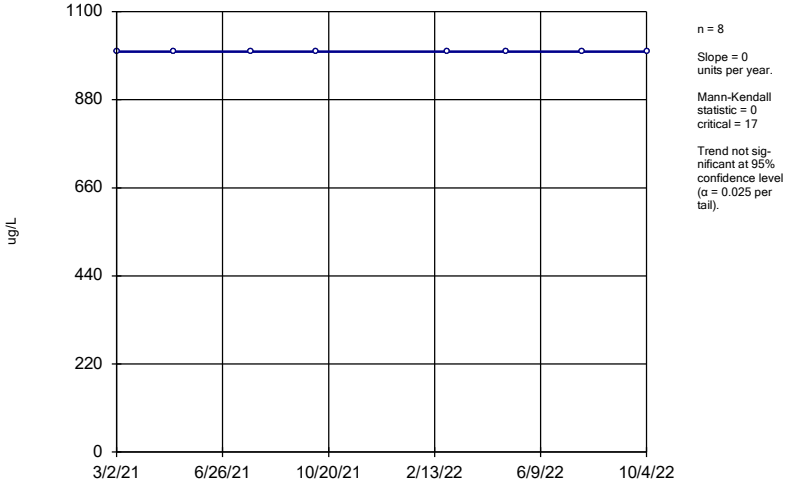
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Fluoride

OW-12



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 17

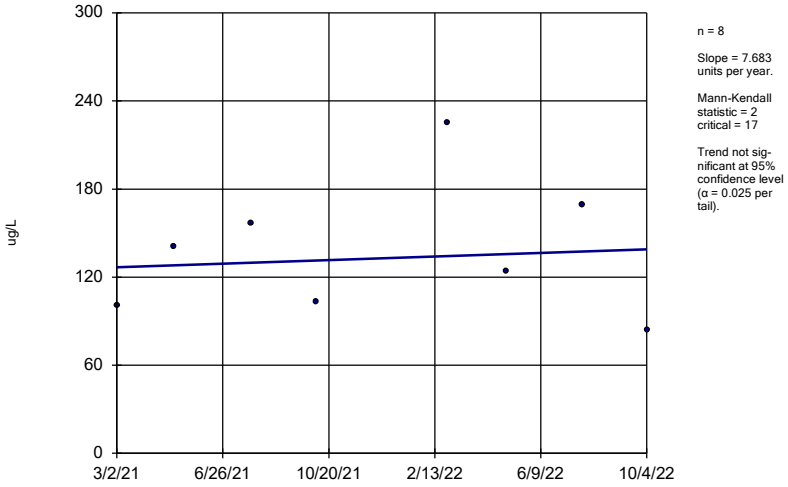
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Iron, Total

DEK-MW-15003



n = 8

Slope = 7.683 units per year.

Mann-Kendall statistic = 2 critical = 17

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

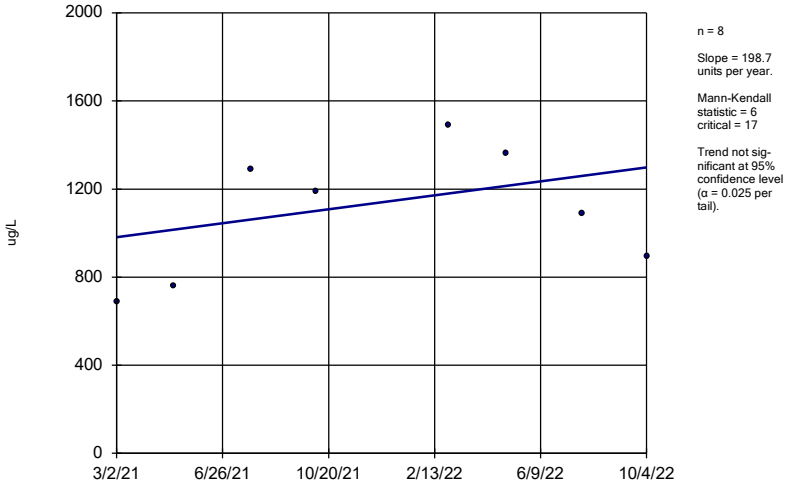
Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Iron, Total

DEK-MW-18001



n = 8

Slope = 198.7 units per year.

Mann-Kendall statistic = 6 critical = 17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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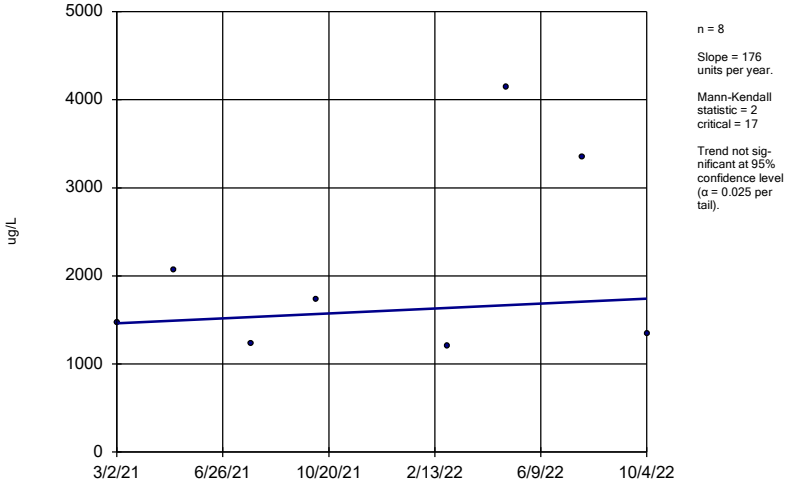
Iron, Total

OW-10



n = 8

Slope = 176 units per year.

Mann-Kendall statistic = 2 critical = 17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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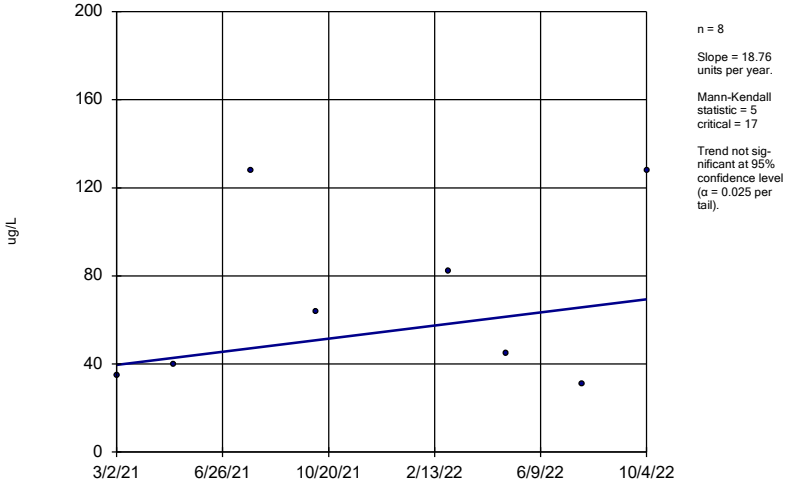
Iron, Total

OW-11



n = 8

Slope = 18.76 units per year.

Mann-Kendall statistic = 5 critical = 17

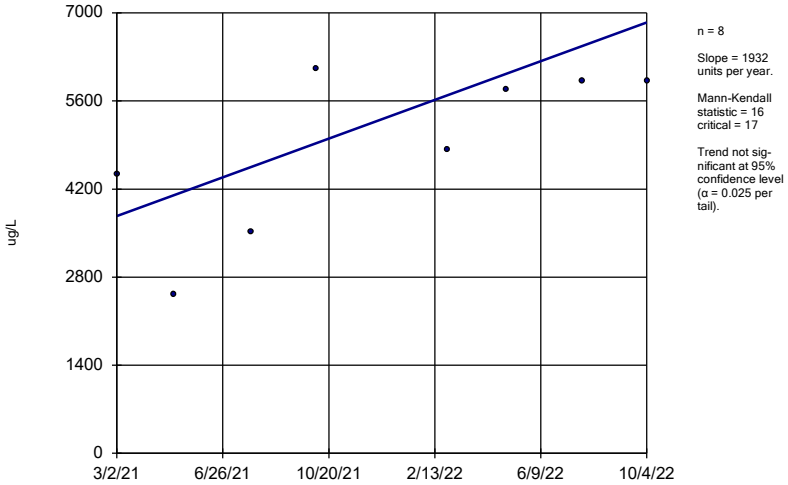
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Iron, Total

OW-12



n = 8

Slope = 1932 units per year.

Mann-Kendall statistic = 16
critical = 17

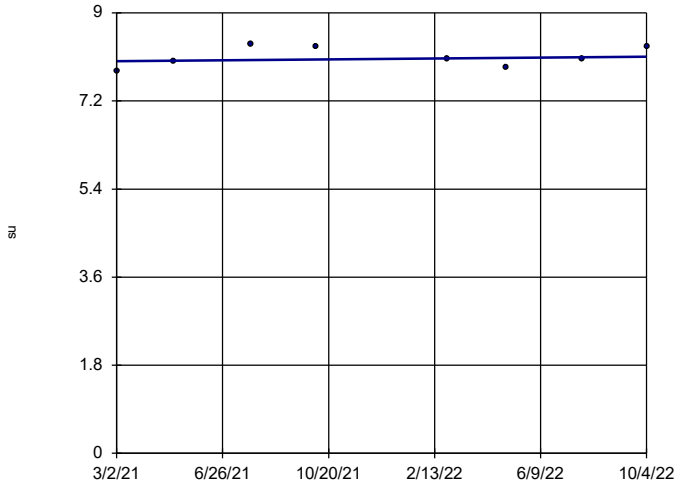
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

pH, Field

DEK-MW-15003



n = 8

Slope = 0.05596 units per year.

Mann-Kendall statistic = 6
critical = 17

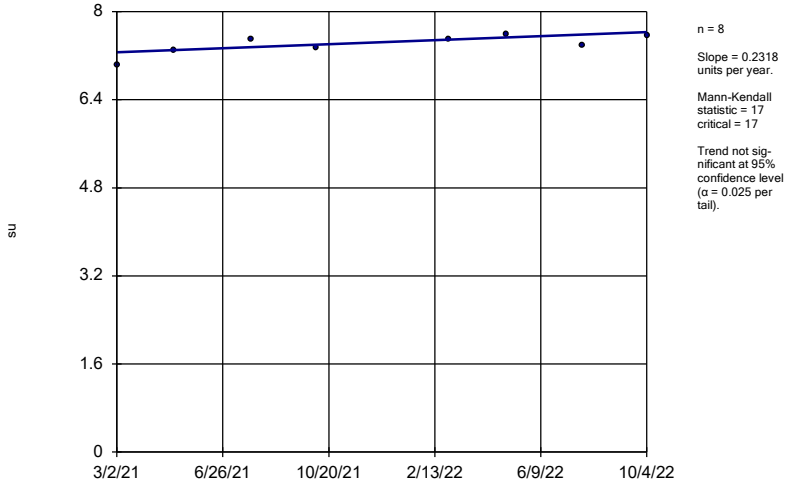
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

pH, Field

DEK-MW-18001



n = 8

Slope = 0.2318 units per year.

Mann-Kendall statistic = 17
critical = 17

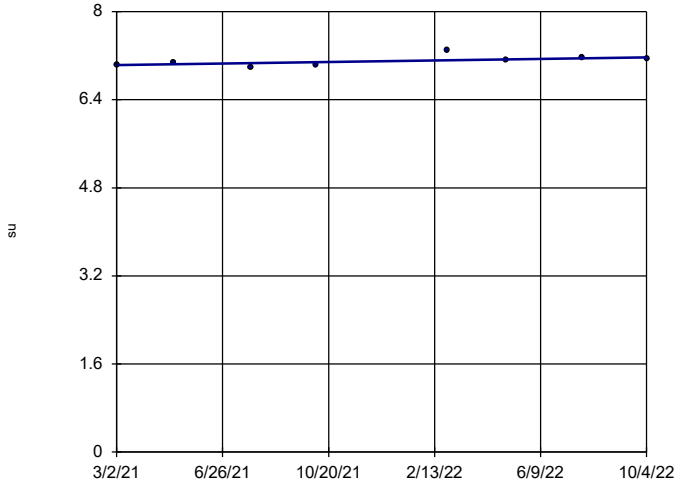
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:52 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

pH, Field

OW-10



n = 8

Slope = 0.08917 units per year.

Mann-Kendall statistic = 14
critical = 17

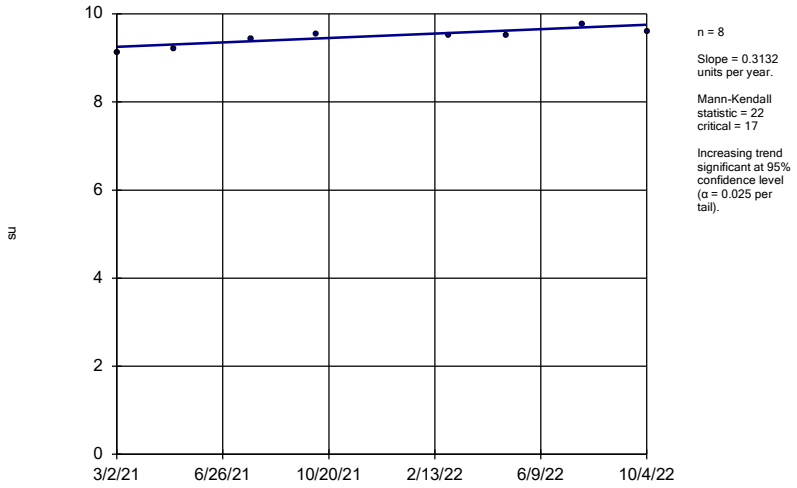
Trend not significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

pH, Field

OW-11



n = 8

Slope = 0.3132 units per year.

Mann-Kendall statistic = 22
critical = 17

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

Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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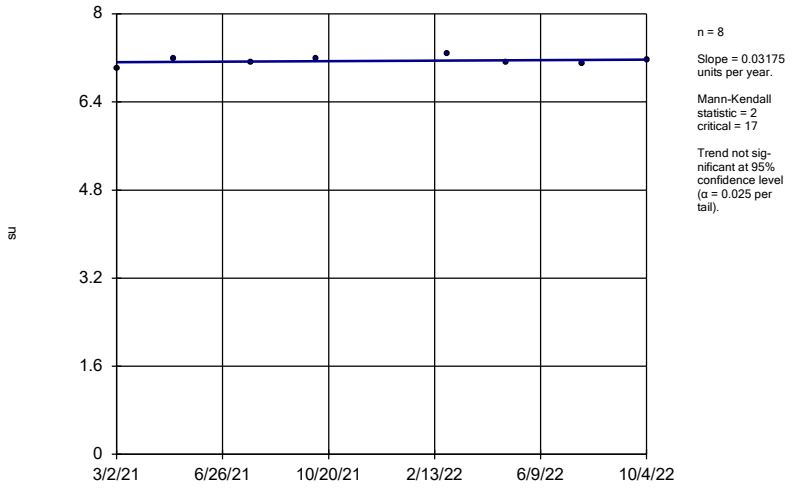
pH, Field

OW-12



n = 8

Slope = 0.03175 units per year.

Mann-Kendall statistic = 2
critical = 17

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

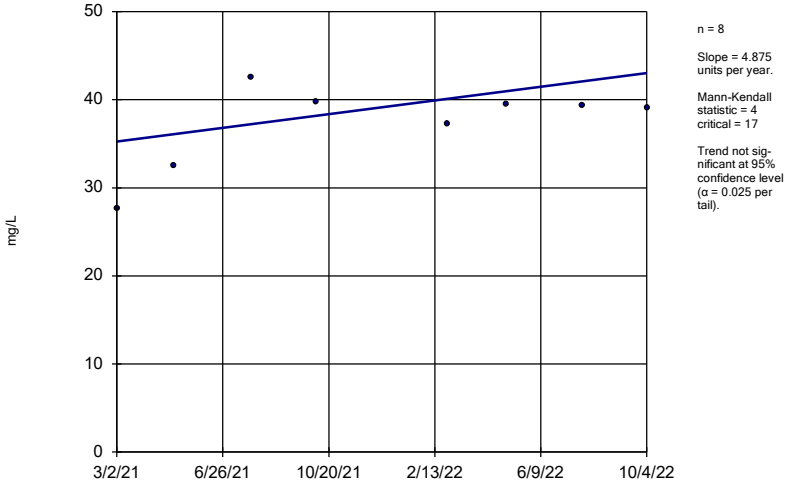
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Sulfate

DEK-MW-15003



n = 8

Slope = 4.875 units per year.

Mann-Kendall statistic = 4
critical = 17

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

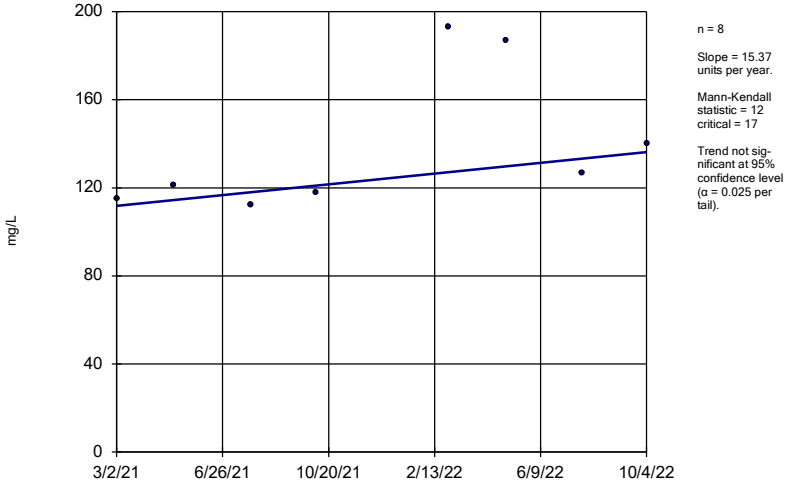
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Sulfate

DEK-MW-18001



n = 8

Slope = 15.37 units per year.

Mann-Kendall statistic = 12
critical = 17

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

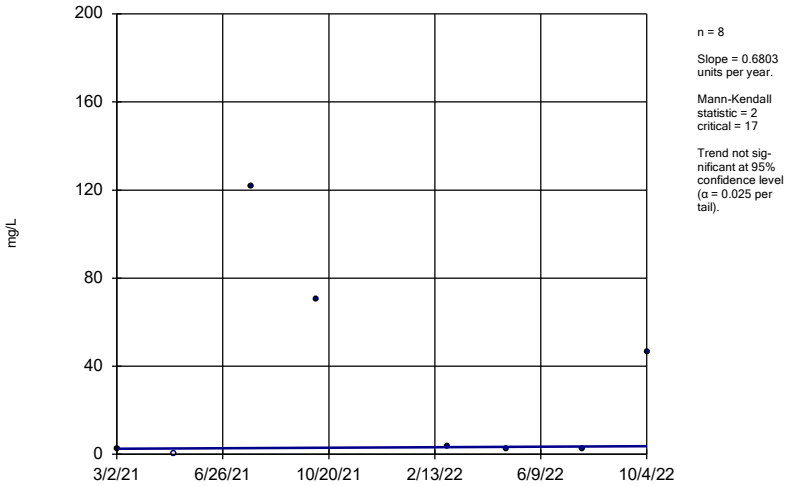
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Hollow symbols indicate censored values.

Sulfate

OW-10



n = 8

Slope = 0.6803 units per year.

Mann-Kendall statistic = 2 critical = 17

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

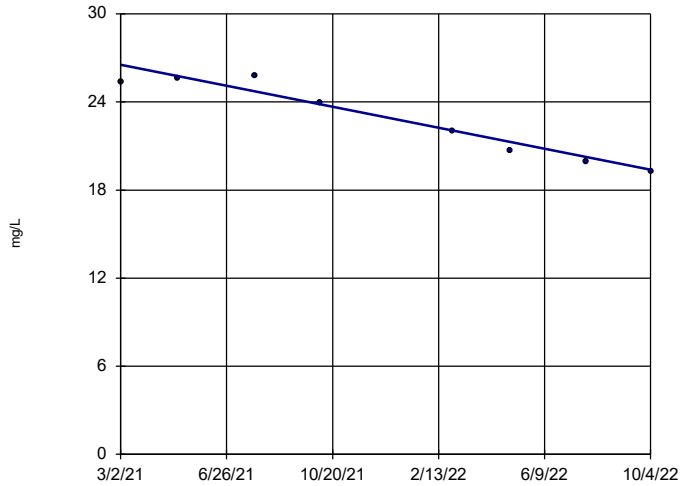
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Sulfate

OW-11



n = 8

Slope = -4.49 units per year.

Mann-Kendall statistic = -22 critical = -17

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

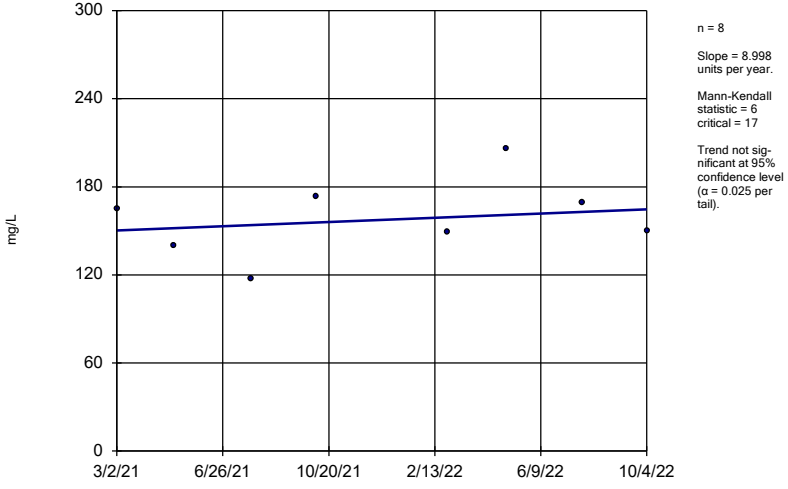
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Sulfate

OW-12



n = 8

Slope = 8.998 units per year.

Mann-Kendall statistic = 6 critical = 17

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

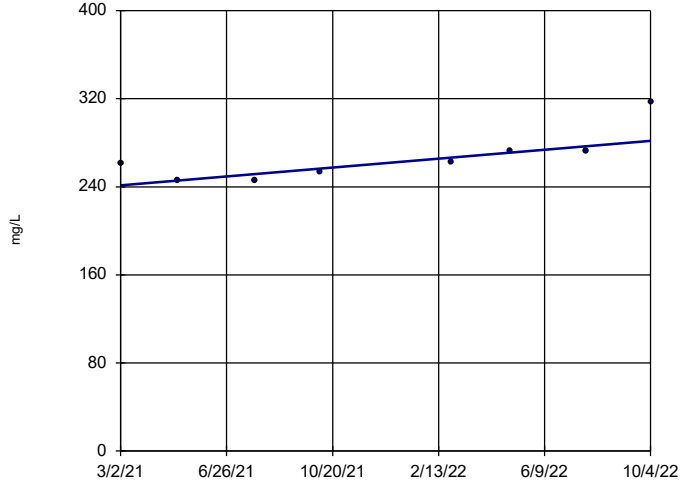
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Total Dissolved Solids

DEK-MW-15003



n = 8

Slope = 25.37 units per year.

Mann-Kendall statistic = 19 critical = 17

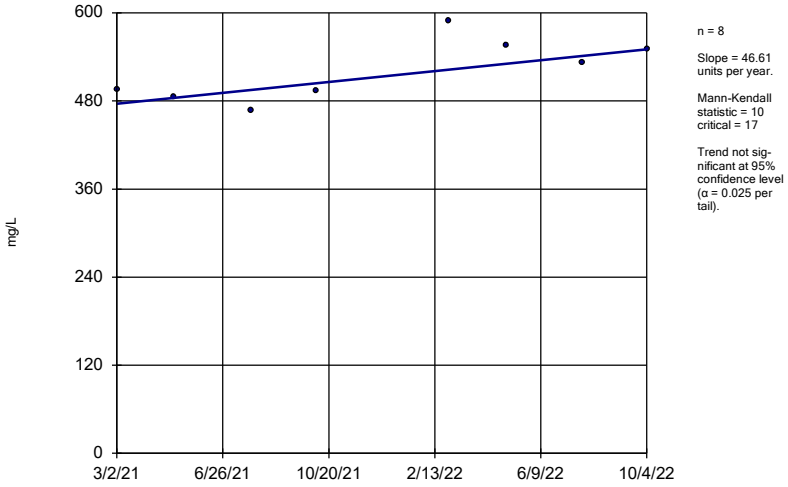
Increasing trend significant at 95% confidence level (α = 0.025 per tail).

Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Total Dissolved Solids

DEK-MW-18001



n = 8

Slope = 46.61 units per year.

Mann-Kendall statistic = 10 critical = 17

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

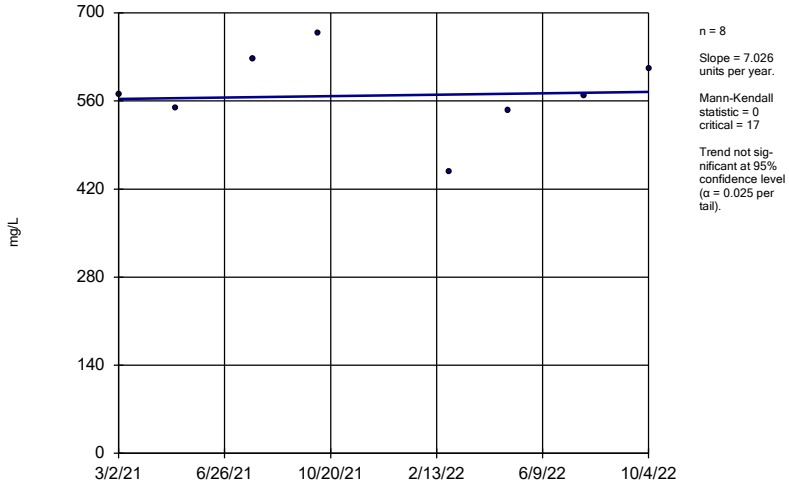
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Total Dissolved Solids

OW-10



n = 8

Slope = 7.026 units per year.

Mann-Kendall statistic = 0 critical = 17

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

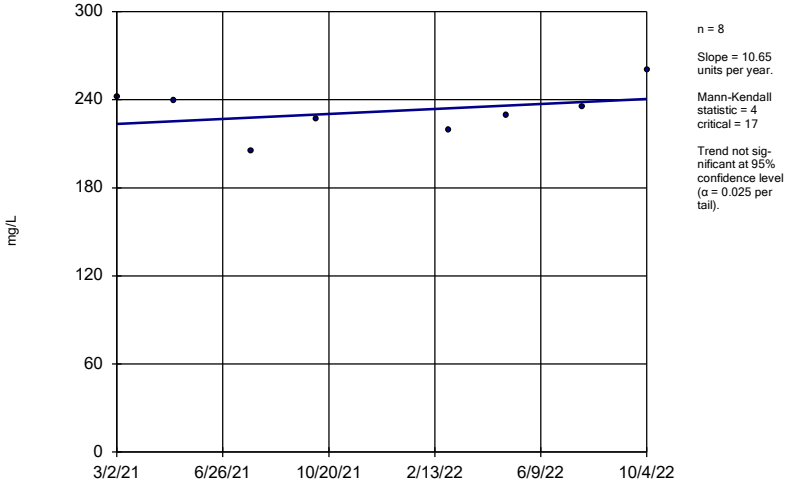
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Total Dissolved Solids

OW-11



n = 8

Slope = 10.65 units per year.

Mann-Kendall statistic = 4 critical = 17

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

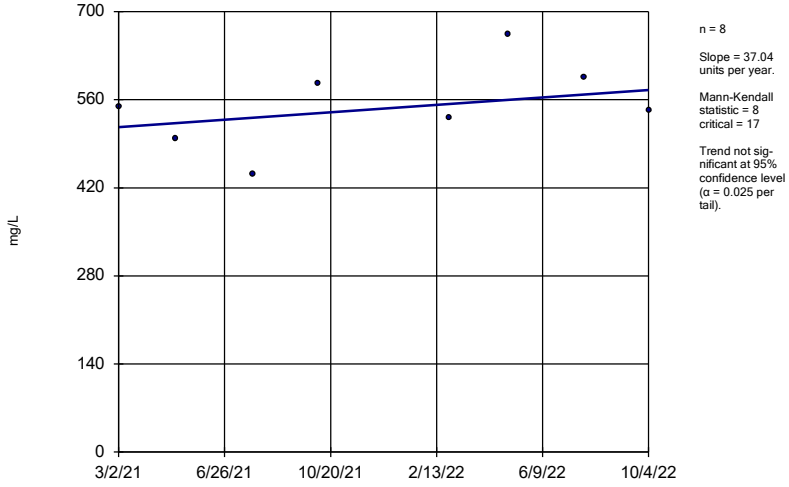
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

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

Total Dissolved Solids

OW-12



n = 8

Slope = 37.04 units per year.

Mann-Kendall statistic = 8 critical = 17

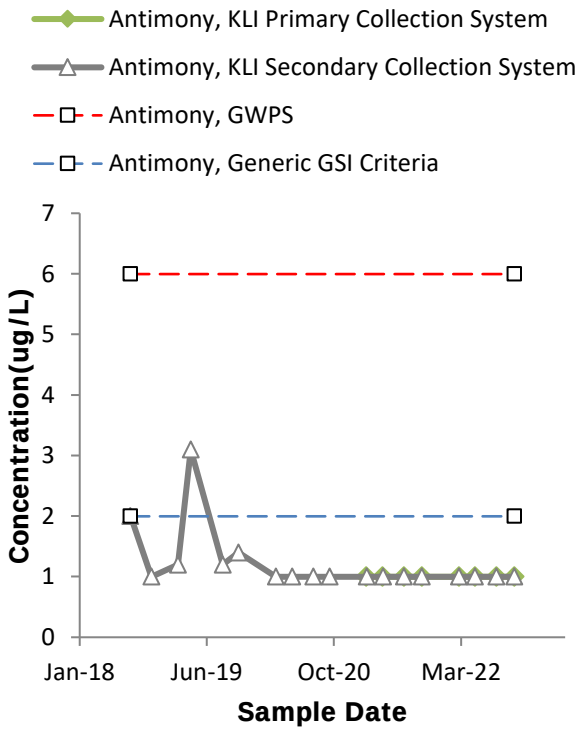
Trend not significant at 95% confidence level (α = 0.025 per tail).

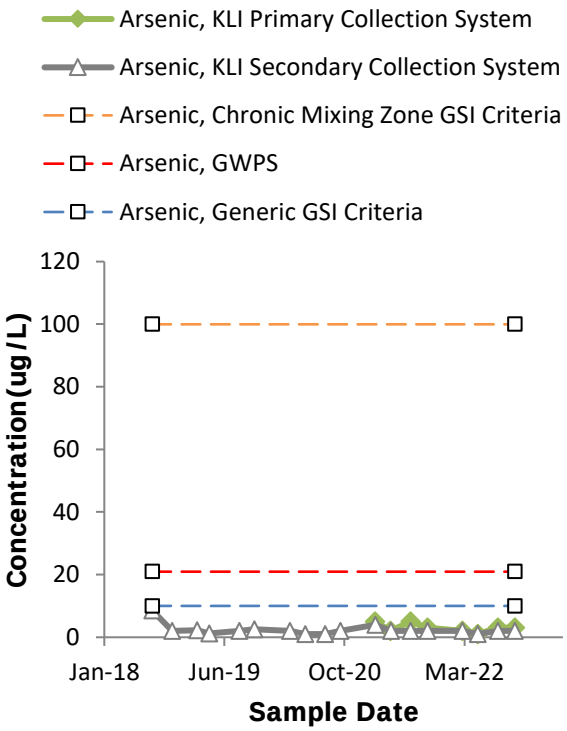
Sen's Slope Estimator Analysis Run 11/22/2022 11:53 AM

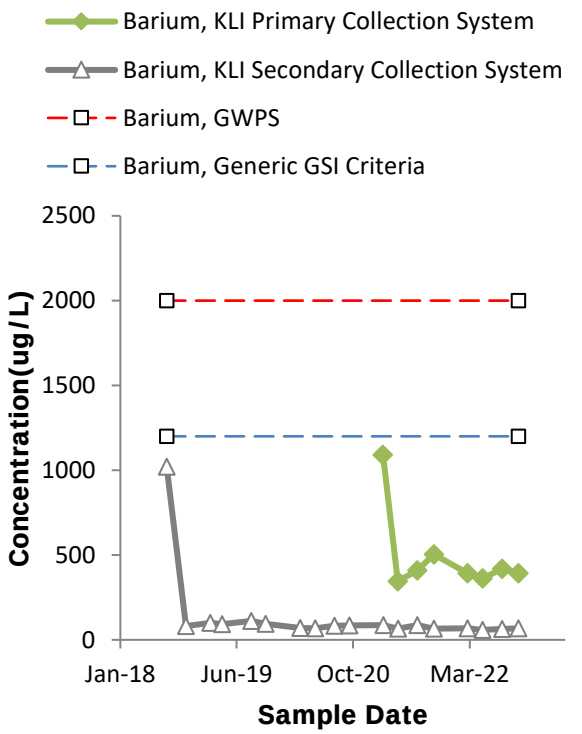
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

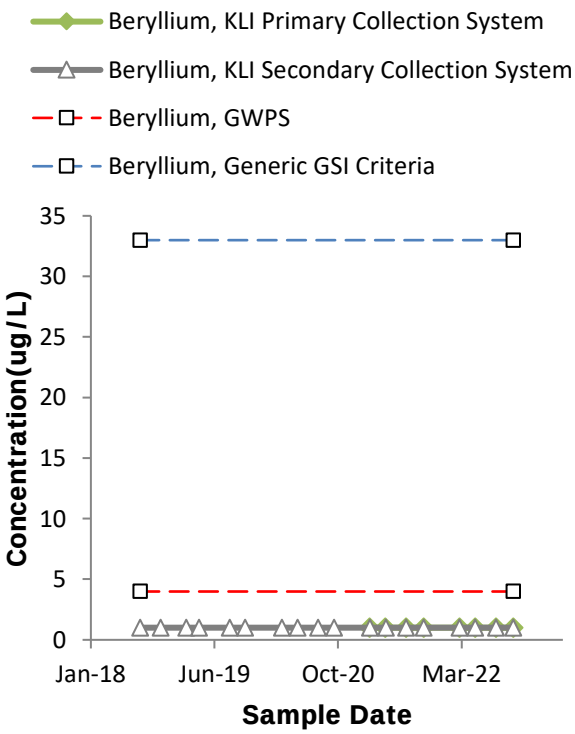
Appendix E
Secondary Leachate Collection System Monitoring

Water Quality Time Series

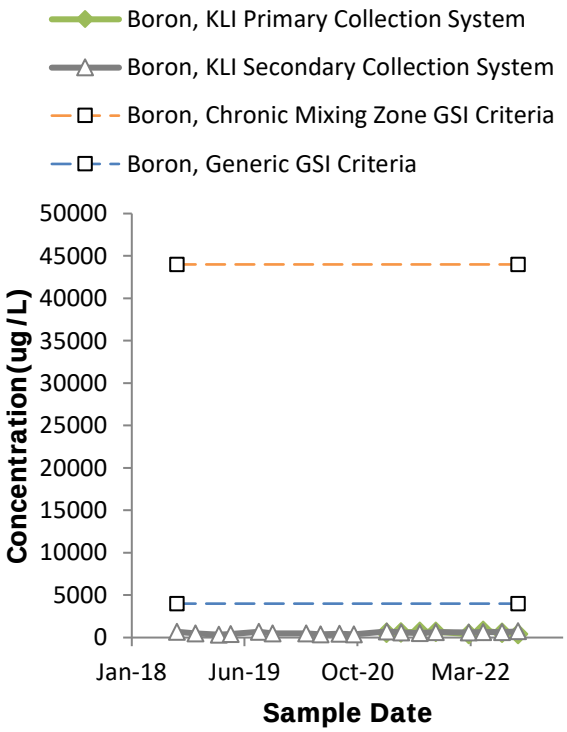


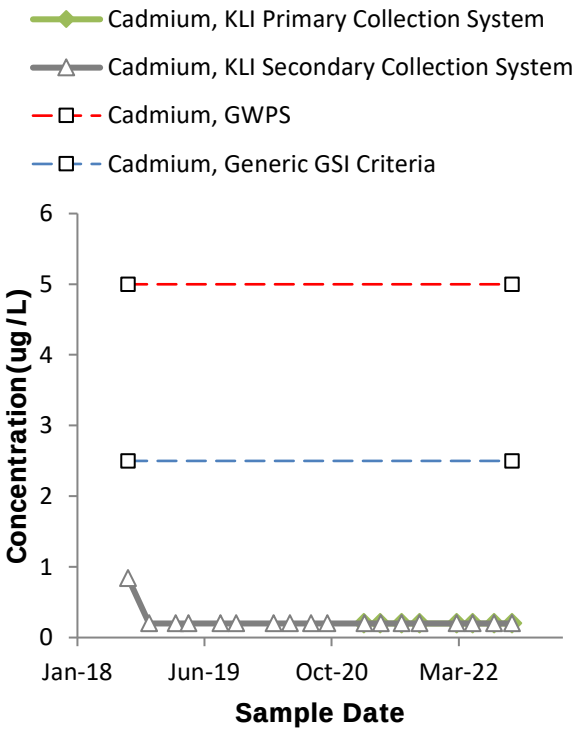


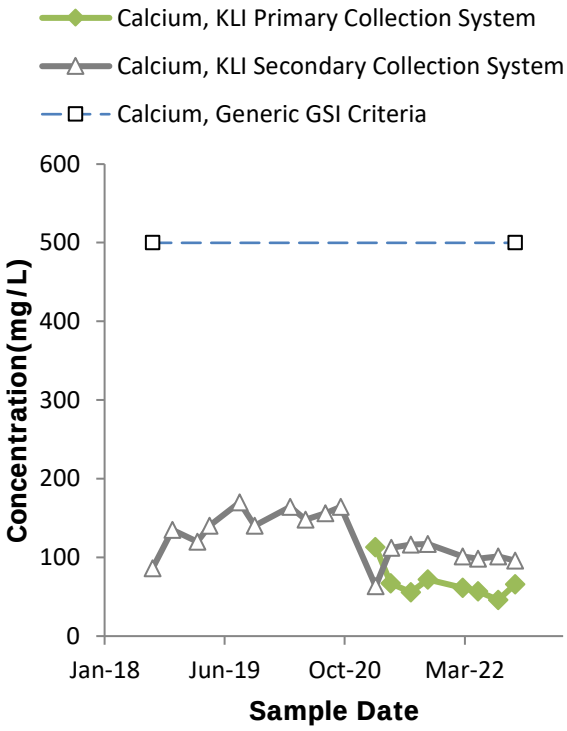


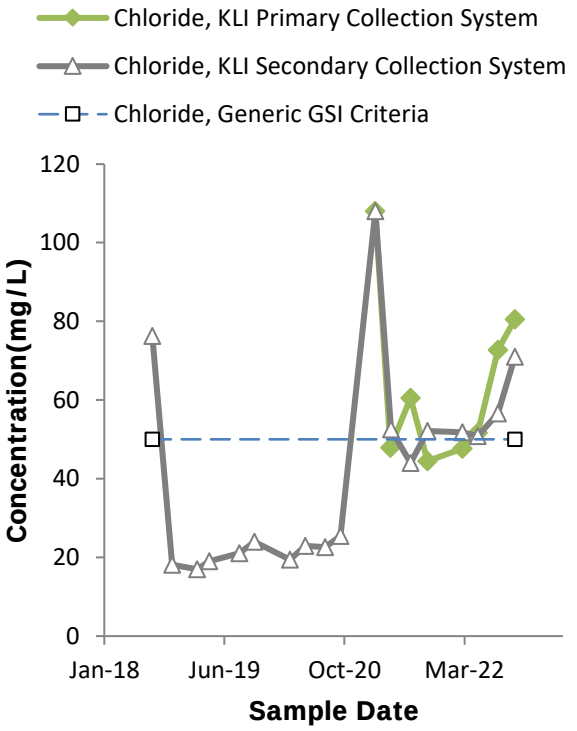


Water Quality Time Series

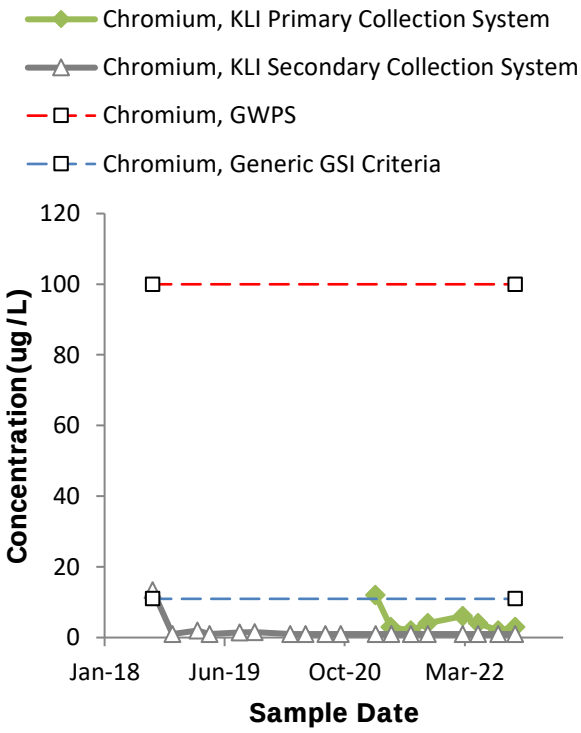


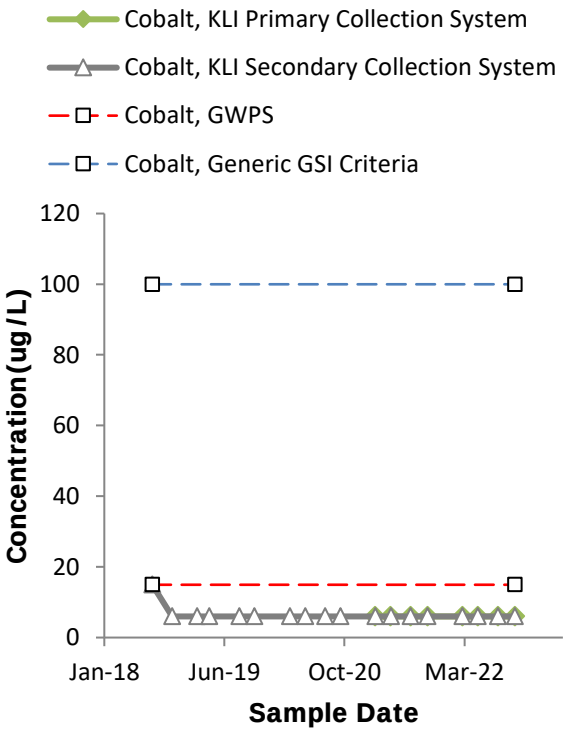


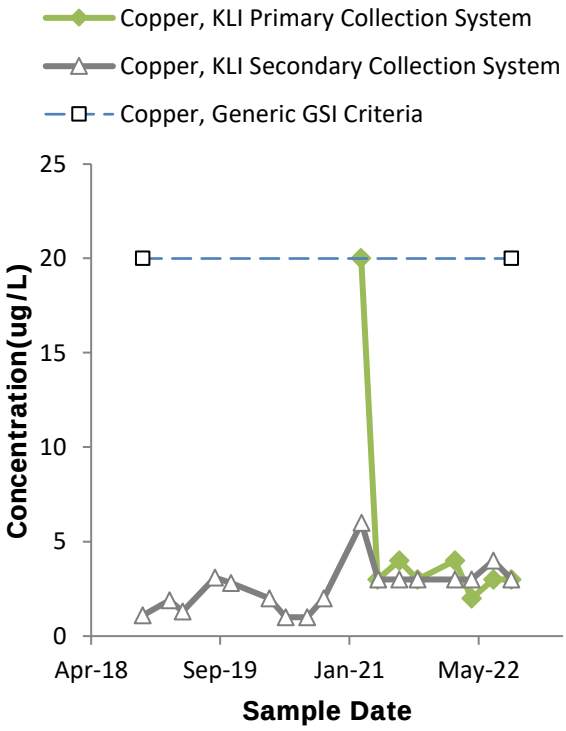


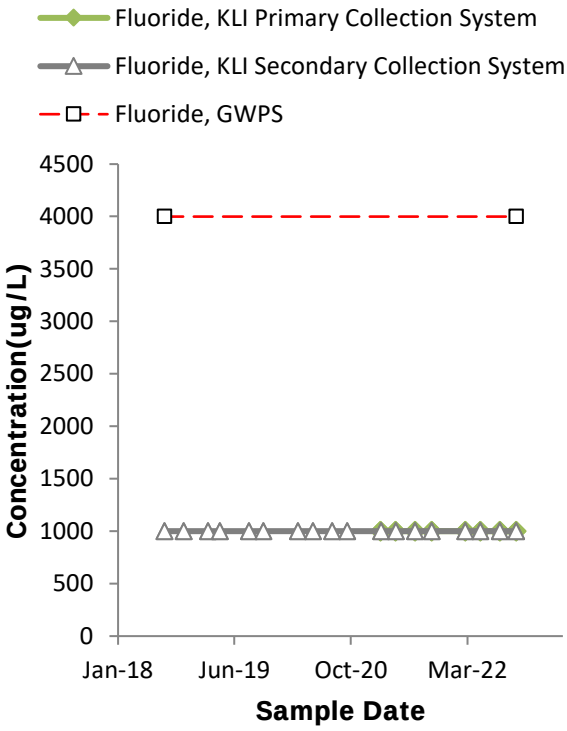


Water Quality Time Series

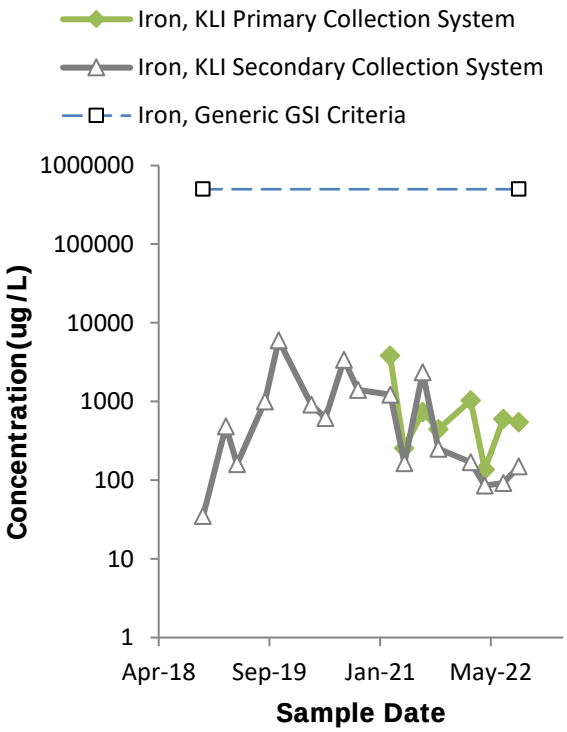


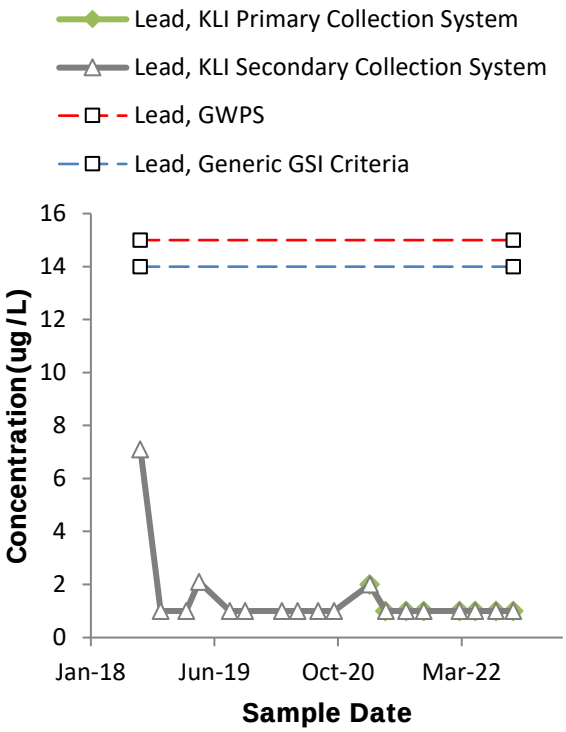


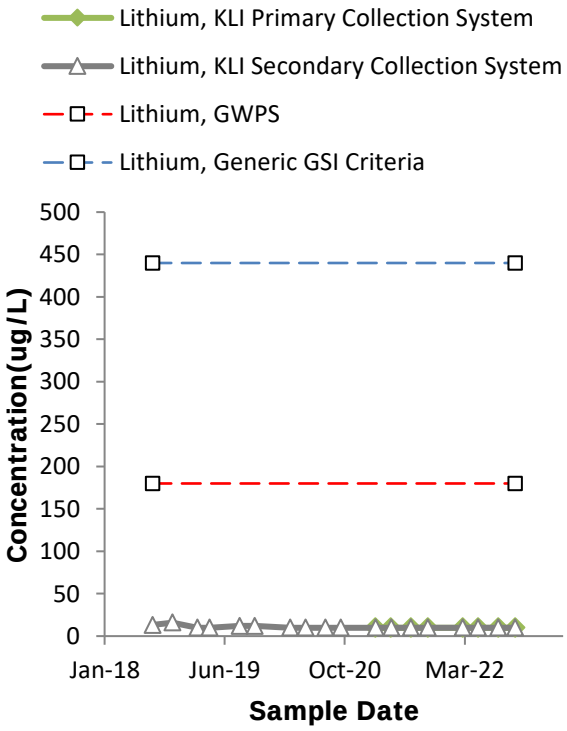


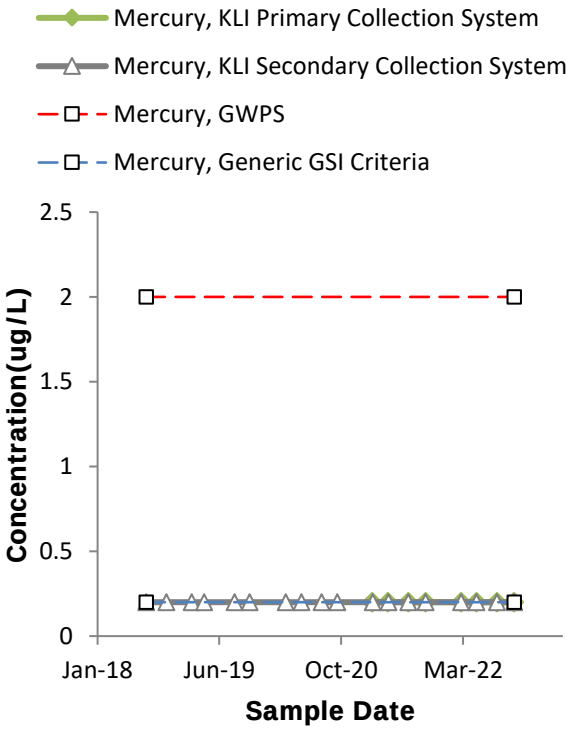


Water Quality Time Series

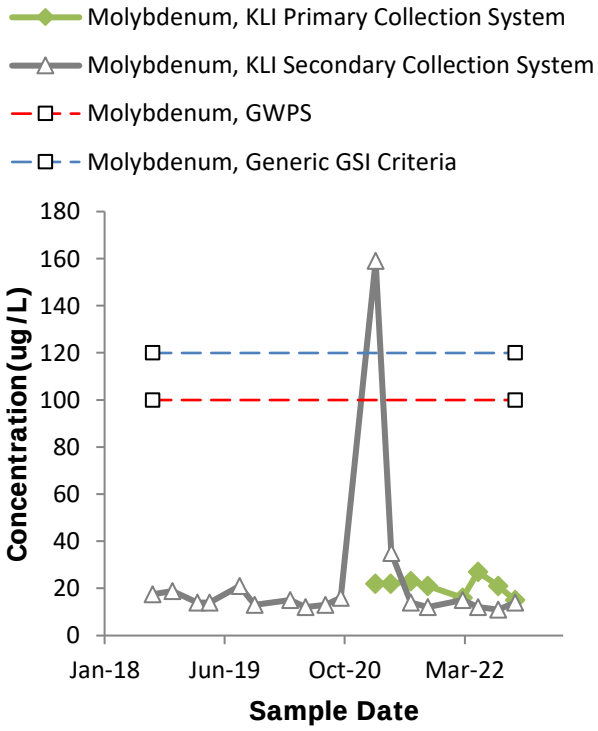


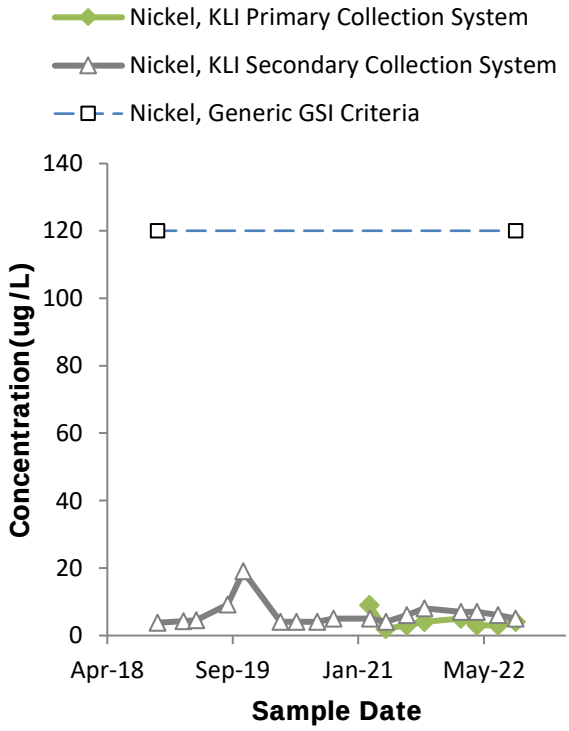


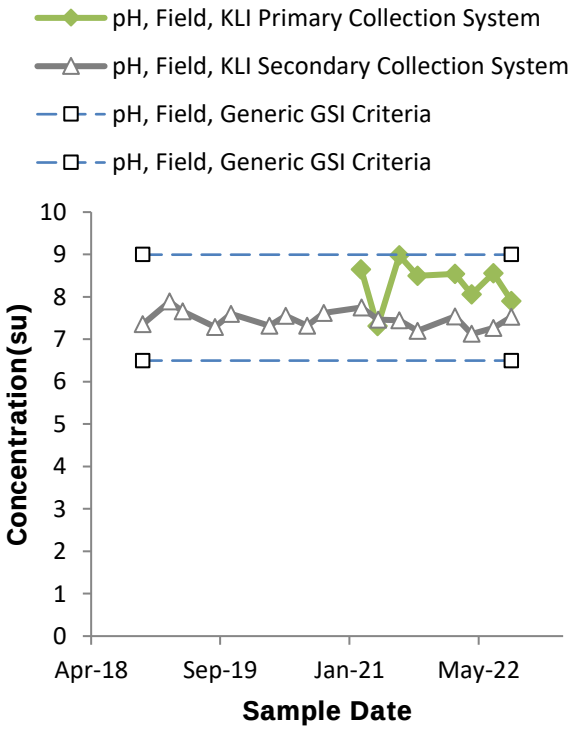


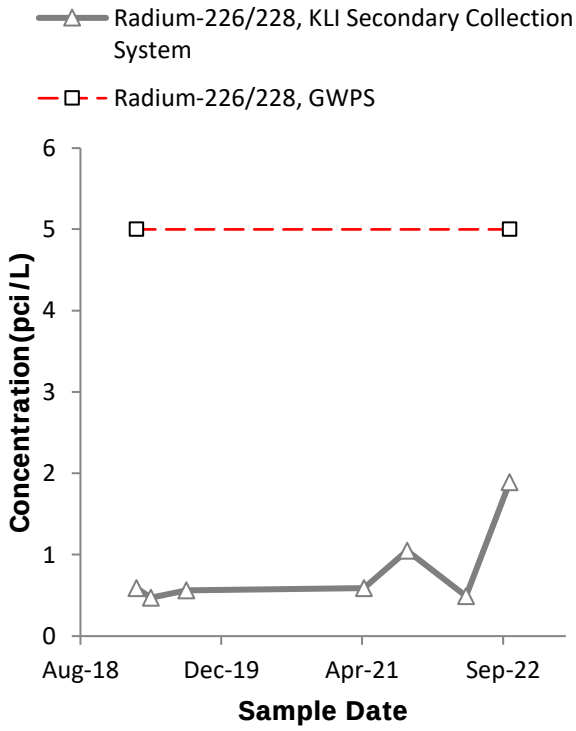


Water Quality Time Series

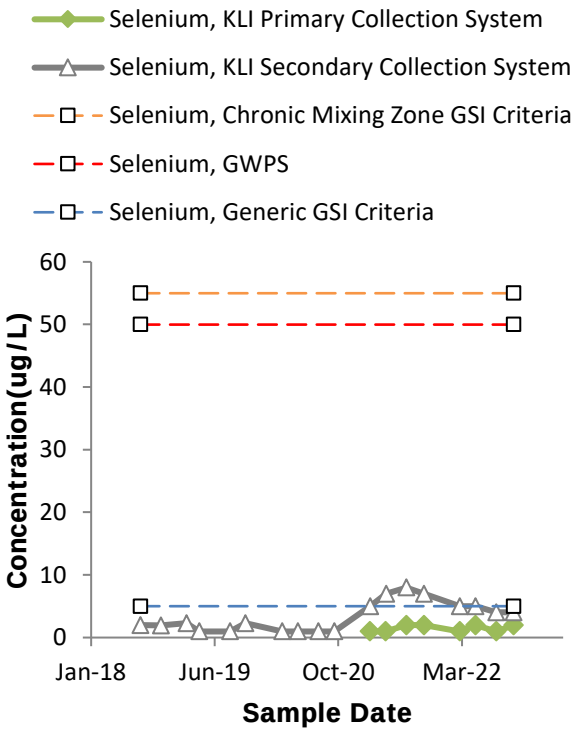


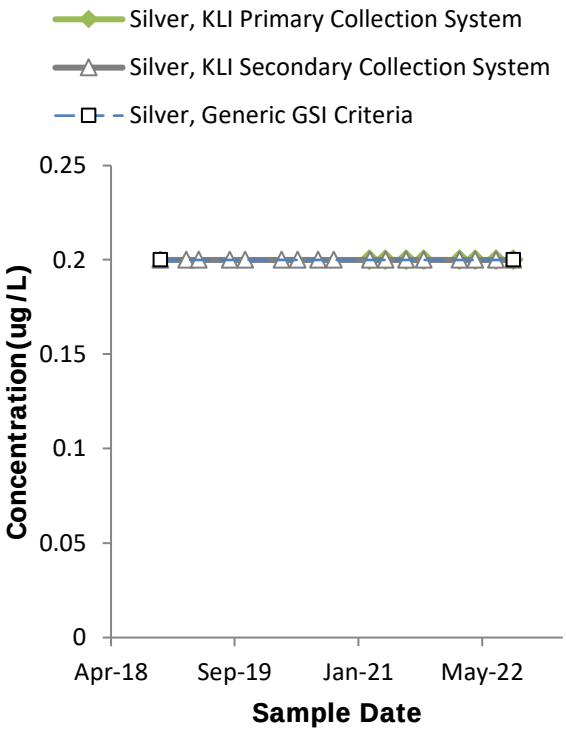


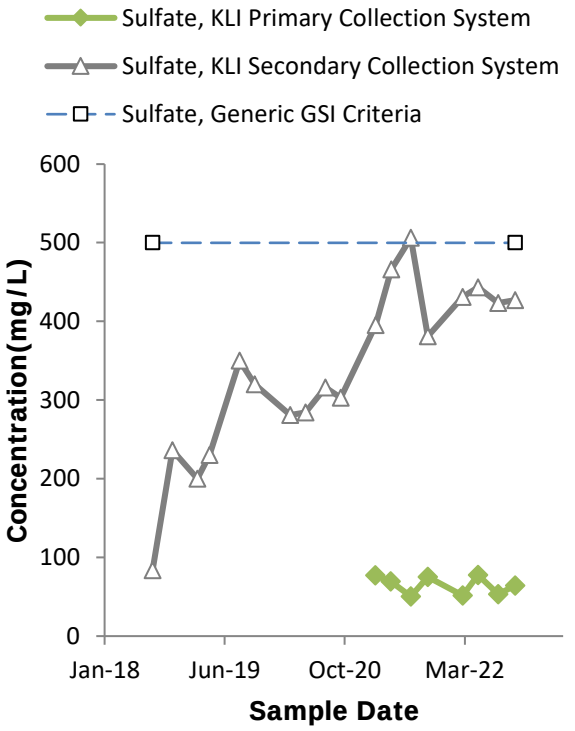


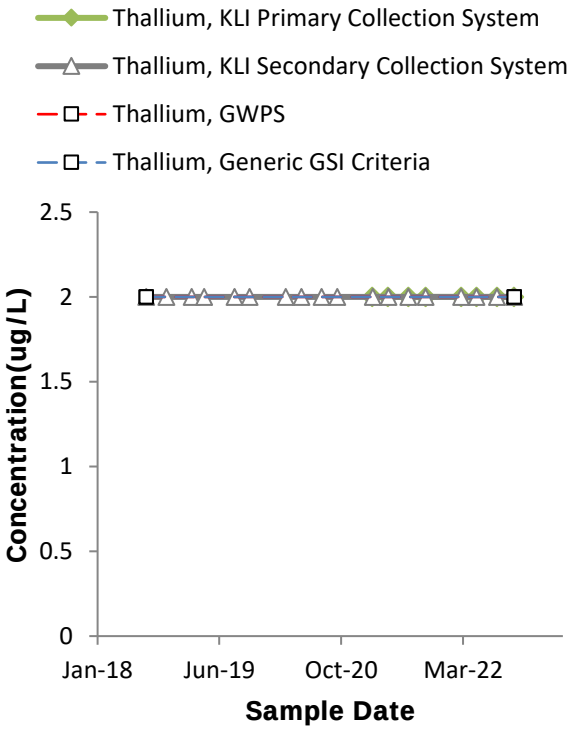


Water Quality Time Series

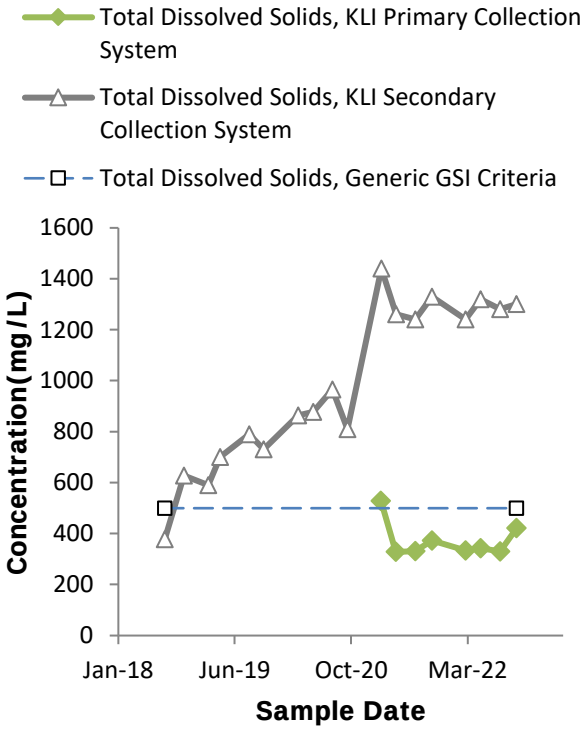


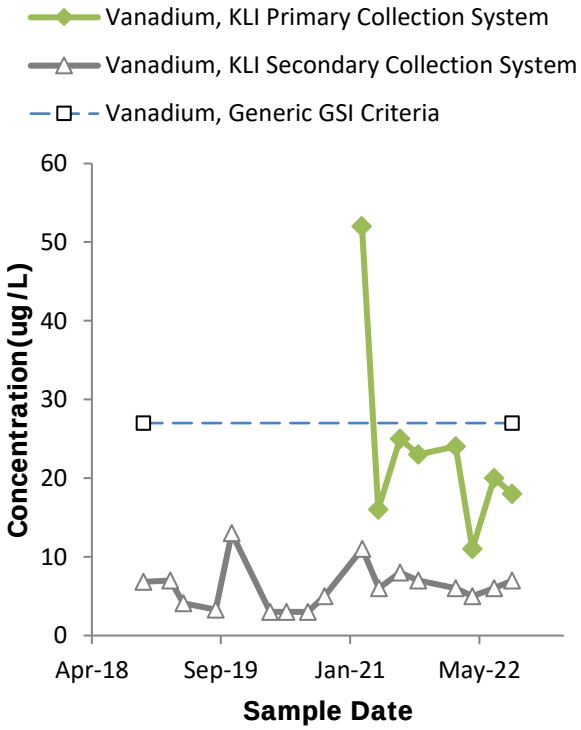


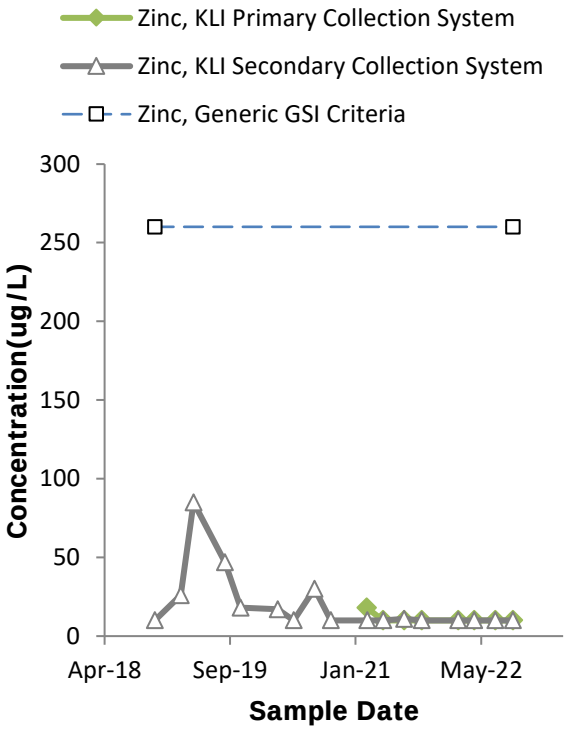




Water Quality Time Series







Appendix F
Alternate Source Demonstration

Consumers Energy
Count on Us®

A CMS Energy Company

Date: January 27, 2023

To: Operating Record

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

RE: Alternate Source Demonstration Professional Engineer Certification, §257.94(e)2
DE Karn Lined Impoundment CCR Unit

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

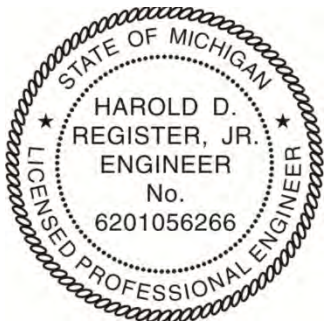
I hereby certify that the alternative source demonstration presented within this Fourth Quarter 2022 Hydrogeological Monitoring Report for the DE Karn Lined Impoundment CCR unit has been prepared to meet the requirements of Title 40 CFR §257.94(e) 2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Signature

January 27, 2023
Date of Certification

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

6201056266
Professional Engineer Certification Number



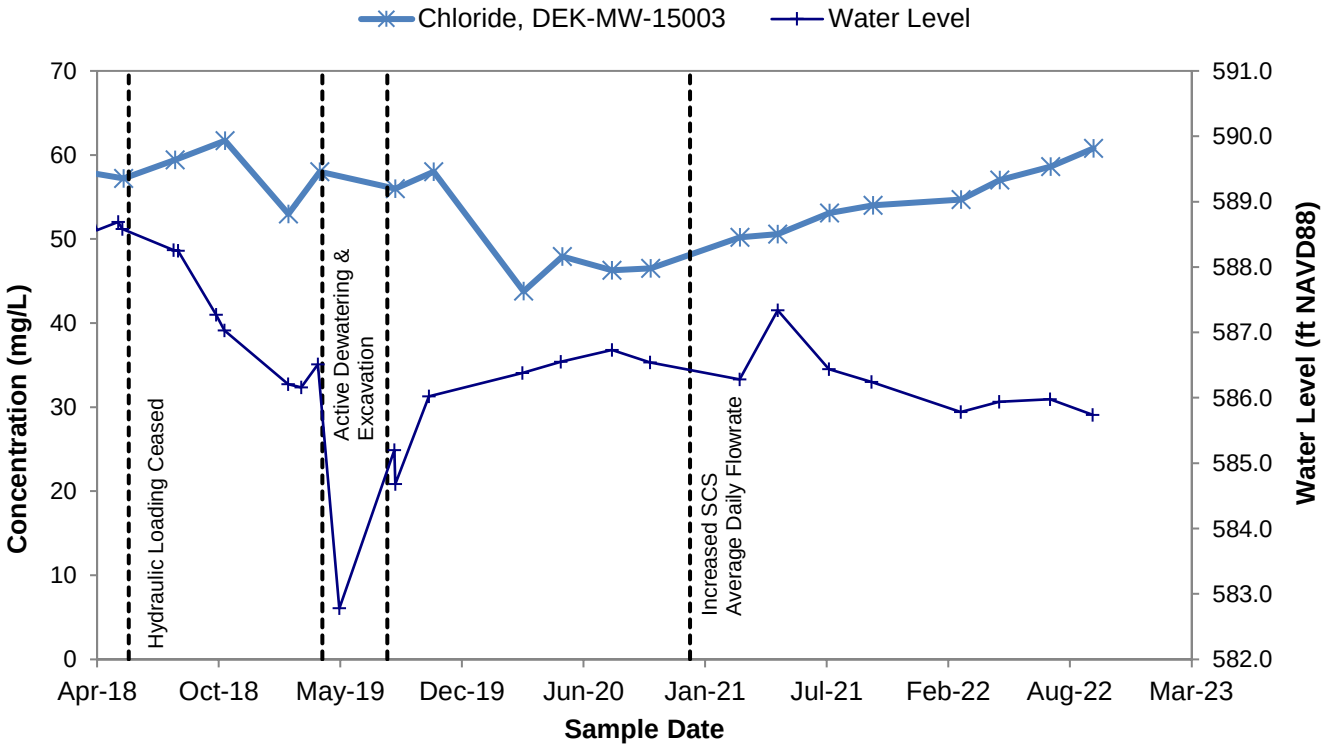
01/27/2023

References

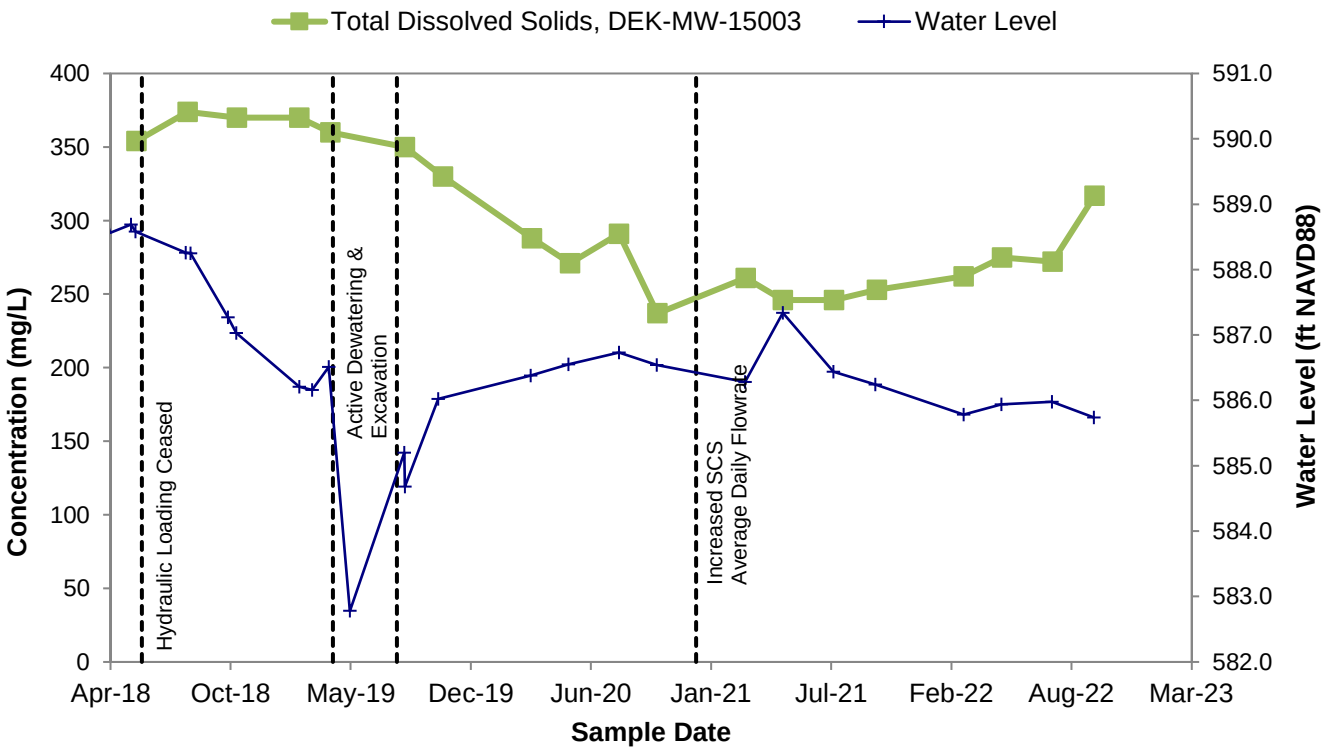
TRC (January 2023). *Fourth Quarter 2022 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan*

Alternate Source Demonstration Time Series

Chloride at DEK-MW-15003



Total Dissolved Solids at DEK-MW-15003



Alternate Source Demonstration Time-Series

Total Dissolved Solids at DEK-MW-15003