Addendum No. 2
Assessment of Corrective Measures
Landfill and Surface Impoundment

Lansing Generating Station
Lansing, Iowa

Prepared for:

Alliant Energy

SCS ENGINEERS

25220082.00 | June 5, 2023

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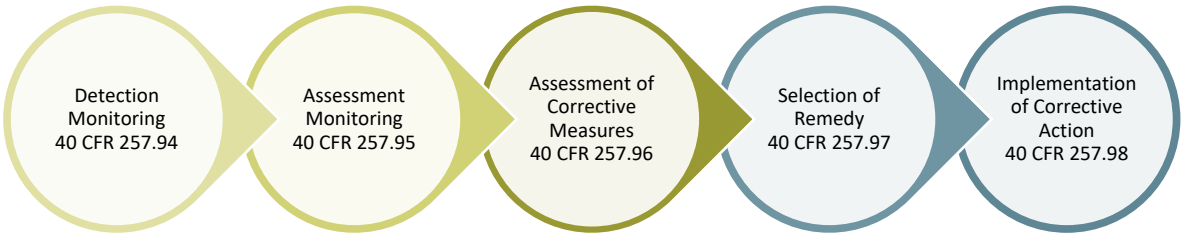
EXECUTIVE SUMMARY

Interstate Power and Light Company (IPL), an Alliant Energy company, operates a dry ash landfill and ash pond at the Lansing Generating Station (LAN). The landfill and pond are used to manage coal combustion residuals (CCR) and wastewater from the power plant, which burned coal to generate electricity until December 31, 2022.

IPL samples and tests the groundwater in the area of the landfill and pond to comply with U.S. Environmental Protection Agency (U.S. EPA) standards for the Disposal of CCR from Electric Utilities, or the "CCR Rule" (Rule). Groundwater monitoring is also conducted under an Iowa Department of Natural Resources (IDNR) sanitary disposal project permit for the landfill.

Groundwater samples from one of the wells installed under the Rule to monitor the landfill and pond contain arsenic at levels higher than the Groundwater Protection Standards (GPS) defined in the Rule. Arsenic occurs naturally and can be present in coal and CCR.

IPL prepared an Assessment of Corrective Measures (ACM) Report in September 2019 in response to the groundwater sampling results obtained to comply with the Rule at the LAN facility. The ACM process is one step in a series of steps defined in the Rule and shown below.



To prepare the ACM, IPL worked to understand the following:

- Types of soil and rock deposits in the area of the LAN facility.
- Depth of groundwater.
- Direction that groundwater is moving.
- Potential sources of the arsenic in groundwater.
- The area where arsenic levels are higher than the U.S. EPA standards.
- The people, plants, and animals that may be affected by levels of arsenic in groundwater that are above the GPS.

IPL has identified appropriate options, or Corrective Measures, to bring the levels of arsenic in groundwater below U.S. EPA standards. In addition to stopping landfill disposal of CCR and the discharge of CCR and LAN wastewater to the pond, these corrective measures include:

- No Action
- Cap CCR in Place with Monitored Natural Attenuation (MNA)
- Consolidate CCR and Cap with MNA
- Excavate and Dispose CCR on Site with MNA
- Excavate and Dispose CCR in Off-site Landfill with MNA
- Consolidate and Cap with Chemical Amendment

- Consolidate and Cap with Groundwater Collection
- Consolidate and Cap with Barrier Wall

Because the time allowed by the Rule to prepare the ACM was limited, IPL has continued work to improve the understanding of the items listed above and issued ACM Addendum No. 1 in November 2020, to update the ACM. The current ACM addendum (Addendum No. 2) has been prepared to further update the ACM for LAN based on the information now available.

Based on continued assessment of the nature and extent of arsenic, current data indicates that the source of the arsenic GPS exceedances is unrelated to the dry ash landfill and ash pond.

Arsenic occurs naturally in air, water, soil, and rock. Arsenic is also commonly present in coal and CCR. The CCR Units do not appear to be the source of the arsenic GPS exceedances. Lines of evidence that indicate the arsenic GPS exceedances are not from the CCR Units are:

- Low arsenic concentrations have repeatedly been reported in laboratory tests of groundwater samples from a monitoring well nest installed between the CCR Units and the well where arsenic concentrations exceed the GPS.

- The arsenic concentration in a sample collected from the Upper Ash Pond outfall was below the arsenic GPS. The outfall sample included the flow from a groundwater interceptor drain installed between the Upper Ash Pond and the well where arsenic concentrations exceed the GPS.

Lines of evidence that support an alternate source of arsenic GPS exceedances are:

- Anoxic reducing conditions that can result in increased arsenic concentrations are present in a localized area near the well with arsenic GPS exceedances.

- Anoxic conditions, resulting in potential higher arsenic concentrations, may be caused by the organic material described in the boring log of the well with arsenic GPS exceedances. The organic material is absent in other site monitoring wells.

If needed, IPL will continue to provide semiannual updates on its progress in evaluating Corrective Measures to address the groundwater impacts at LAN.

IPL held a public meeting on October 12, 2020, to discuss the contents of the September 2019 ACM with interested and affected parties. IPL held an additional public meeting on January 11, 2022, to discuss the ACM Addendum No. 1. Before a remedy is selected, IPL will hold a public meeting with interested and affected parties to discuss Addendum No. 2.

For more information on Alliant Energy, view our Corporate Responsibility Report at https://poweringwhatsnext.alliantenergy.com/crr/.

1.0 INTRODUCTION AND PURPOSE

An Assessment of Corrective Measures (ACM) at the Interstate Power and Light Company (IPL) Lansing Generating Station (LAN) was prepared to comply with U.S. Environmental Protection Agency (U.S. EPA) regulations regarding the Disposal of Coal Combustion Residuals from Electric Utilities [40 CFR 257.50-107], or the "CCR Rule" (Rule). Specifically, the ACM was initiated and this report was prepared to fulfill the requirements of 40 CFR 257.96, including:

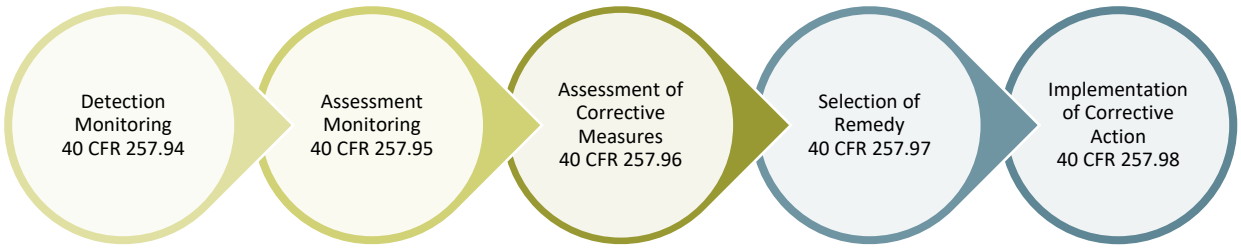
- Prevention of further releases
- Remediation of release
- Restoration of affected areas

An ACM Report was issued in September 2019 to summarize the remedial alternatives for addressing the Groundwater Protection Standard (GPS) exceedances observed in the 2018 sampling events and identified in the Notification of GPS Exceedance dated February 13, 2019. The September 2019 ACM and a subsequent ACM Addendum No. 1 issued in November 2020 identified additional information needed to inform the selection of a corrective measure (remedy) for LAN according to 40 CFR 257.97.

IPL has continued to evaluate the source of the GPS exceedance and has concluded that it is not associated with the coal combustion residual (CCR) Units. ACM Addendum No. 2 has been prepared as an update to the ACM process, although the CCR Units are not the source of the arsenic GPS exceedances that triggered the ACM.

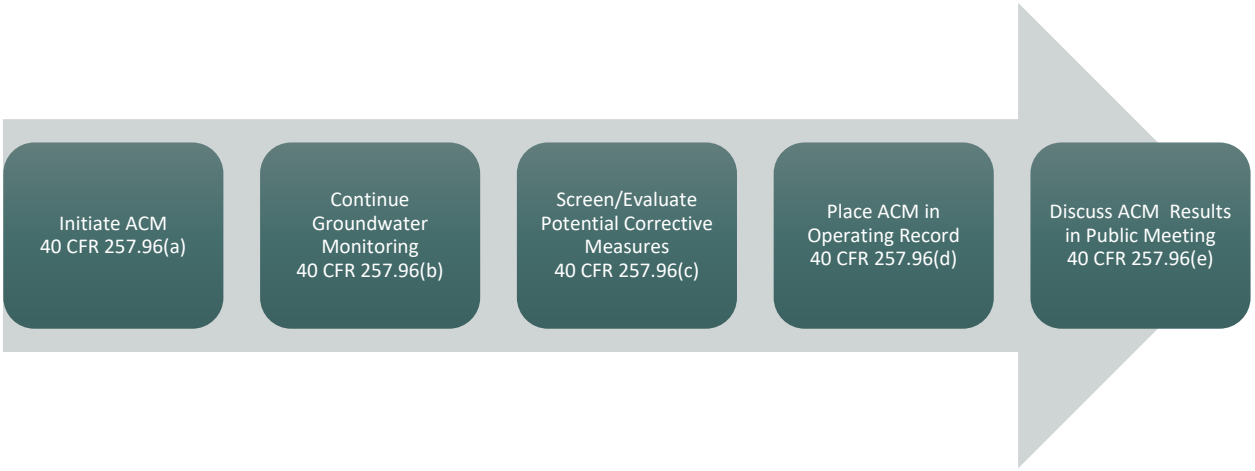
1.1 ASSESSMENT OF CORRECTIVE MEASURES PROCESS

As discussed above, Addendum No. 2 was prepared to update the ACM and previous addendums developed in response to GPS exceedances observed in groundwater samples collected at the LAN facility. The ACM process is one step in a series of steps defined in the CCR Rule and depicted in the graphic below. To date, IPL has implemented a detection monitoring program per 40 CFR 257.94 and completed assessment monitoring at LAN per 40 CFR 257.95. The September 2019 ACM was required based on the groundwater monitoring results obtained through October 2018. With the ACM completed and now updated with new information, IPL is required to select a remedy according to 40 CFR 257.97. The remedy selection process must be completed as soon as feasible, and, once selected, IPL is required to start the corrective action process within 90 days.



The process for developing the ACM is defined in 40 CFR 257.96 and is shown in the graphic below. IPL held a public meeting on October 12, 2020, to discuss the contents of the September 2019 ACM with interested and affected parties. IPL held an additional public meeting on January 11, 2022, to discuss the ACM Addendum No. 1.

Since IPL is required to discuss the ACM results in a public meeting at least 30 days before selecting a remedy, another public meeting will be held to discuss ACM Addendum No. 2. Information about the site, the groundwater monitoring completed, the groundwater impacts as they are currently understood, and the completed assessment activities are discussed in the sections that follow.



1.2 SITE INFORMATION AND MAP

LAN is located along the west bank of the Mississippi River, south of the City of Lansing, in Allamakee County, Iowa. The address of the plant is 2320 Power Plant Drive in Lansing, Iowa (**Figure 1**). The coal-fired generating plant at LAN ceased coal-fired electric generating activities at the end of 2022 and is currently being decommissioned. The facility also includes a CCR landfill and a CCR settling pond. The LAN facility was originally constructed in 1948, with additional units added in 1957 and 1976.

The groundwater monitoring system at LAN is a multi-unit system monitoring two existing CCR Units that are contiguous:

- LAN Landfill (existing landfill)
- LAN Upper Ash Pond (existing surface impoundment)

The LAN Landfill is operated under a sanitary disposal project permit (Permit #03-SDP-05-01P) administered by the Iowa Department of Natural Resources (IDNR). A separate groundwater monitoring system has been established to monitor the landfill for the state permit. The state operating permit for the LAN Landfill currently expires in October 2023, and IPL will close the landfill when the landfill reaches capacity or when the operating permit expires, whichever comes first. The landfill will be closed by installing a state-permitted final cover that meets the CCR Rule minimum design requirements in 40 CFR 257.102(d)(3).

The LAN Upper Ash Pond is operated with discharges regulated under individual National Pollutant Discharge Elimination System (NPDES) Permit Number IA0300100. The LAN Upper Ash Pond will close in accordance with the CCR Closure Plan to comply with the requirements of 40 CFR 257.101(b)(1) and 103(f)(2). The pond is expected to close by October 17, 2023.

A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program is provided as **Figure 2**. Monitoring wells installed for the state monitoring program for the CCR landfill are also shown on

Figure 2. The monitoring wells and their location and role in the monitoring network are included in Table 1. A summary of the monitoring event dates are included in Table 2.

2.0 BACKGROUND

2.1 REGIONAL GEOLOGIC INFORMATION

The uppermost geologic formation beneath LAN that meets the definition of the "uppermost aquifer," as defined under 40 CFR 257.53, is the shallow alluvial aquifer in combination with the hydraulically connected lower Cambrian-Ordovician sandstone unit (Jordan sandstone). A summary of the regional hydrogeologic stratigraphy is included in Appendix A.

The uppermost bedrock unit in the site area is the Jordan aquifer, which is the lower Cambrian-Ordovician sandstone interbedded with dolostone. The thickness of the Jordan aquifer varies from 50 to more than 120 feet thick in most areas of Allamakee County. Underlying the Cambrian-Ordovician sandstone are the Cambrian confining beds comprised of dolostone, siltstone, and shale. The Cambrian confining beds overly the Dresbach Aquifer, comprised of shaly sandstone. A summary of the regional hydrogeologic stratigraphy is presented in Appendix A. A regional bedrock surface hydrogeologic map, hydrogeologic cross sections, and a contour map of the top of the Cambrian-Ordovician sandstone in northeastern Iowa are also included in Appendix A. The bedrock surface elevation is highly variable due to erosion.

The Mississippi River and associated alluvial aquifers are a major source of surface water and shallow groundwater in the area. The alluvial aquifer is up to 60 feet thick within the deeply incised valley where LAN is located, but is thin to absent on the surrounding bluffs and hilltops. The lower Cambrian-Ordovician sandstone unit (Jordan sandstone) is the shallowest regional bedrock aquifer. The October 1989 IDNR Water Atlas No. 8 states that the Jordan aquifer is commonly the source of municipal and industrial high-capacity wells in the region. A summary of the regional groundwater units is included in Appendix A.

2.2 SITE GEOLOGIC AND HYDROGEOLOGIC INFORMATION

A map showing the regional potentiometric surface in the Jordan sandstone is presented in Appendix A. This map shows the potentiometric surface near the site area as sloping to the east-northeast. The flow direction in the shallow unconsolidated aquifer at LAN is generally to the north-northwest, and the groundwater flow direction and water levels fluctuate seasonally due to the proximity to the river. The flow direction of the Mississippi River is from northwest to southeast.

Monitoring wells MW-301 through MW-309, and MW-302A, MW-304A, MW-306A, and MW-307A were installed to intersect the surficial alluvium aquifer at the site. The unconsolidated material found at these well locations is generally sand and silt. The total boring depths were between 16 and 56 feet below ground surface (bgs) and bedrock was not encountered in these borings. Upgradient well MW-6 was previously installed for a state groundwater monitoring program, which is required as part of the solid waste permit for the CCR landfill. MW-6 was installed to a total depth of 93.5 feet bgs and intersects the water table, which is in the Jordan sandstone aquifer at this well location. Boring logs for MW-6 and MW-301 through MW-307A are included in Appendix B.

Depth to groundwater as measured in the site monitoring wells varies from 3 to 75 feet bgs due to topographic variations across the facility and seasonal variations in water levels and due to the proximity to the river. The flow direction of the Mississippi River is from northwest to southeast. Groundwater elevations and monitoring well screen elevations are included in Table 3. Water table

and potentiometric maps for April, August, and October 2021 are shown on **Figures 3** through **6**. Boring logs and well construction reports on included in **Appendix B**.

Shallow groundwater at the site generally flows to the north-northwest. The groundwater flow pattern based on water levels measured in 2022 is shown on **Figures 3** and **5**. The deeper groundwater within the alluvium flows to the north-northeast as shown on **Figures 4** and **6**. The groundwater elevation data for the CCR rule monitoring wells and the state program monitoring wells are provided in **Table 3**.

A geologic cross-section A-A' was prepared along a line through the CCR Units and in alignment with the direction of groundwater flow (**Figure 8A**). The cross-section line runs through the landfill, the Upper Ash Pond, and the coal pile, and also shows upgradient monitoring well MW-6, several borings or monitoring wells near the landfill and pond, and downgradient assessment monitoring well nest MW-306/306A. Sandstone bedrock, unconsolidated geologic material, and estimated water table levels are identified on the cross-section A-A' that is zoomed into the immediate area around monitoring well MW-302 is shown on **Figure 8B**. A cross-section running perpendicular to the valley and through the landfill is shown on **Figure 9**. The cross-section locations are provided on **Figure 7**.

2.3 CCR RULE MONITORING SYSTEM

The original groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and three downgradient (compliance) monitoring wells. The background monitoring well is MW-6. The three initial downgradient monitoring wells are MW-301, MW-302, and MW-303, which were installed in November 2015 (**Figure 2**). Monitoring well MW-302 was installed as close as practicable on the north side of the Lower Ash Pond (non-CCR Unit) due to utility obstructions between the south side of the Lower Ash Pond and the base of the Upper Ash Pond berm. Three additional downgradient delineation monitoring wells, MW-304, MW-305, and MW-306, were installed in May 2019, and three deeper delineation piezometers MW-302A, MW-304A, and MW-306A were installed in December 2019. Delineation monitoring well nest MW-307/MW-307A and water table observation wells MW-308 and MW-309 were installed in June 2021, in accordance with the requirements of 40 CFR 257.95(g)(1). The MW-307/MW-307A nest was installed at the downgradient edge of the Upper Ash Pond at a location that was unavailable during the installation of the original compliance network. At the time of monitoring well installations in 2016, the berm on the downgradient edge of the Upper Ash Pond was undergoing a structural stability assessment and it was not deemed prudent to install a well in the berm. In the years following completion of the assessment, it was determined that installation of wells in the berm would not compromise the integrity of the berm, so wells MW-307/MW-307A were installed to provide more information regarding groundwater passing the downgradient waste boundary of the Upper Ash Pond. The CCR Rule wells were installed in the upper portion of the uppermost aquifer at LAN. Well depths range from approximately 14.5 to 91 feet bgs.

3.0 NATURE AND EXTENT OF GROUNDWATER IMPACTS

3.1 POTENTIAL SOURCES

The potential sources of the arsenic impacts in groundwater have been under evaluation since the initiation of the ACM that was issued in September 2019. Based on the data obtained to date, the LAN Upper Ash Pond and LAN Landfill are no longer considered the likely source of the statistically significant levels (SSLs) above the GPS for arsenic at monitoring well MW-302. Instead, arsenic impacts in groundwater in the area of MW-302 are likely due to in-situ geochemical processes in organic-rich sediments present near MW-302. These processes and the source of arsenic in

groundwater at MW-302 are described in the updated arsenic evaluation completed by ReSolution Partners, LLC that is provided in **Appendix C**.

3.2 GROUNDWATER ASSESSMENT

3.2.1 Groundwater Depth and Flow Direction

Depth to groundwater as measured in the site CCR monitoring wells varies from 3 to 75 feet bgs due to topographic variations across the facility. Groundwater flow at the site is generally to the north-northwest. The flow in the Jordan sandstone immediately beneath the landfill and ponds is also likely to the north-northwest due to the influence of incoming groundwater from the bluffs flanking the valley with ultimate discharge to the Mississippi River. Horizontal gradients and groundwater flow velocities are included in **Table 6**. Vertical gradients are included in **Table 7**.

3.2.2 Groundwater Protection Standard Exceedances Identified

The ACM process was triggered by the detection of arsenic at SSLs exceeding the GPS in samples from MW-302.

This statistical evaluation of the assessment monitoring results was based on the first three sampling events for the Appendix IV assessment monitoring parameters, including sampling events in April, August, and October 2018. The complete results for these sampling events are summarized in **Tables 4A**, **4B**, and **5.**

GPS exceedances for arsenic at MW-302 have continued to be identified in monitoring since the initiation of the ACM. The arsenic concentrations have remained consistent with no discernable trend. Arsenic has not been detected at SSLs above the GPS in any other wells. Therefore, the ACM and addendums address the following GPS exceedance:

Assessment Monitoring Appendix IV Parameters	Location of GPS Exceedance(s)	Historic Range of Detections at Wells with SSL Above GPS	Groundwater Protection Standard (GPS)
Arsenic (µg/L)	MW-302	30.8 to 53	10

µg/L = micrograms per liter
Note: Historic range includes results from assessment monitoring from April 2018 through October 2022.

3.2.3 Expanding the Groundwater Monitoring Network

Delineation monitoring wells MW-304, MW-305, and MW-306 were installed in May 2019 downgradient of the CCR Units to expand the groundwater monitoring network at LAN beyond the edge of the CCR Unit boundaries and to fulfill the requirements of 40 CFR 257.95(g)(1), which requires additional characterization to support a complete and accurate ACM. Three deeper piezometers MW-302A, MW-304A, and MW-306A were installed in December 2019, also in accordance with the requirements of 40 CFR 257.95(g)(1). Groundwater samples were collected following installation of the new monitoring wells. Delineation monitoring well nest MW-307/MW-307A and water table observation wells MW-308 and MW-309 were installed in June 2021, in accordance with the requirements of 40 CFR 257.95(g)(1). The CCR Rule wells were installed in the upper portion of the uppermost aquifer at LAN. Well depths range from approximately 14.5 to 91 feet bgs.

The historical sampling results from MW-302A, MW-304/304A, MW-305, MW-306/306A, and MW-307/307A indicate that there was not a statistically significant exceedance of arsenic in any of these wells. The extent of GPS exceedances is limited to the immediate vicinity of MW-302.

3.2.4 State Monitoring Program Arsenic Results

Arsenic is included in the parameter list for the state monitoring program for the CCR landfill. Monitoring results from the state program, provided in **Table 8**, provide additional information on the nature and extent of arsenic concentrations at the site.

Arsenic GPS exceedances in the state program results are limited to two monitoring well locations (MW-11/11R and MW-12). The arsenic levels at these two locations adjacent to the landfill are lower than the concentrations in downgradient CCR well MW-302. Per IDNR requirements, metals sampling was changed from filtered to unfiltered in 2016. Arsenic concentrations appear to be stable since that time. Metals like arsenic tend to adsorb to suspended solids that can be introduced into the sample during collection, which are not removed from unfiltered samples. Arsenic results from other wells in the vicinity of or downgradient from these two wells (including MW-12P, MW-14, TW-17, TW-18, TW-19, and MW-20) were below the GPS defining the horizontal and vertical extent of arsenic impacts in this area.

Groundwater assessments were performed in accordance with the state monitoring program during 2013 and 2014 to evaluate the elevated arsenic concentrations. The assessment reports concluded that elevated arsenic concentrations were due in part to localized geochemical conditions in the immediate vicinity of the landfill. IDNR required no further investigation of the arsenic concentrations.

3.3 UPDATED NATURE AND EXTENT OF GROUNDWATER IMPACTS

The ACM process was triggered by the detection of arsenic at an SSL above the GPS in samples from water table monitoring well MW-302. This section provides an update of the nature and extent of arsenic impacts since ACM Addendum No. 1 was completed.

Molybdenum has also been detected at an SSL above the GPS in samples from piezometer MW-304A; however, molybdenum concentrations at this well are attributed to naturally occurring molybdenum in the Cambrian-Ordovician aquifer. The lines of evidence supporting this conclusion were outlined in an Alternative Source Demonstration completed on September 3, 2021. Because the molybdenum GPS exceedance was not due to the CCR Units, molybdenum will not be addressed in this Selection of Remedy.

3.3.1 Additional Data Collection

Since the November 2020 ACM Addendum No. 1, additional data collection activities to support evaluation of the nature and extent of groundwater impacts and potential remedies have included the following:

- A groundwater sample was collected from the interceptor trench located between Power Plant Drive and the former Lower Ash Pond in January 2021 to evaluate intercept trench water for constituents detected in the compliance wells. The interceptor trench is shown on Cross-section A-A' (**Figure 8B**). A discussion of this sample result is included in the Arsenic Assessment Update (**Appendix C**).

- Additional groundwater samples were collected in February 2021 for analysis of arsenic at MW-306 and molybdenum at MW-304A.

- The April 2021 groundwater monitoring event was completed for the routine semiannual assessment monitoring program. The wells sampled included the wells in the original monitoring program (MW-6, MW-301, MW-302, and MW-303); the three additional wells (MW-304, MW-305, and MW-306) installed in June 2019; and three additional wells (MW-302A, MW-304A, and MW-306A) installed in December 2019.

- Three additional water table monitoring wells and one piezometer were installed in June 2021. Monitoring wells MW-307 and MW-307A were installed to provide information on horizontal and vertical groundwater flow and the distribution of target groundwater quality parameters. Monitoring wells MW-308 and MW-309 were installed to provide groundwater flow information only, and will be monitored for water levels only (no sample collection). The groundwater elevations in the vicinity of monitoring wells MW-308 and MW-309 (**Table 3**) show that the local groundwater flow is toward the outfall located between wells MW-308/MW-309 and MW-302. Since the shallow groundwater where wells MW-308 and MW-309 are screened is not downgradient of monitoring well MW-302, they are not sampled for groundwater quality parameters. The localized flow in the area of MW-308, MW-309, and MW-302 is shown on the **Figure 8B** cross section.

- Groundwater samples were collected in July 2021 for analysis of arsenic at MW-306 and molybdenum at MW-304A, as well as a full analysis of assessment monitoring parameters for the newly installed MW-307 and MW-307A.

- Groundwater samples were collected at MW-307 and MW-307A in August 2021 for a full analysis of assessment monitoring parameters.

- Site-wide groundwater elevation measurements were collected in September 2021.

- The October 2021 groundwater monitoring event was completed for the routine semiannual assessment monitoring program and included CCR monitoring wells MW-301 through MW-309 and the associated deeper piezometers MW-302A, MW-304A, MW-306A, and MW-307A. No groundwater quality samples were collected from monitoring wells MW-308 and MW-309 because they are designated specifically as water table observation wells (water level monitoring only).

- An additional round of groundwater levels were measured in all federal CCR and state monitoring wells during February 2022.

- An additional surface water sample was collected from the combined Outfall 001 and surface water near well MW-302 in February 2022.

- The April 2022 groundwater monitoring event was completed for the routine semiannual assessment monitoring program and included CCR monitoring wells MW-301 through MW-309 and the associated deeper piezometers MW-302A, MW-304A, MW-306A, and MW-307A.

- The October 2022 groundwater monitoring event was completed for the routine semiannual assessment monitoring program and included CCR monitoring wells MW-301 through MW-309 and the associated deeper piezometers MW-302A, MW-304A, MW-306A, and MW-307A.

A summary of groundwater samples collected since the ACM was issued is provided in **Table 2.**

3.3.2 Updated Groundwater Assessment – New and Updated Results

Since ACM Addendum No. 1 was completed in November 2020, monitoring wells MW-307 and MW-307A were installed at a location between the Upper Ash Pond and monitoring well MW-302. Specifically, well nest MW-307/MW-307A was installed between the Upper Ash Pond and the former Lower Ash Pond, alongside the Power Plant Drive berm (**Figure 2** and **8B**). This well location was selected to investigate groundwater quality changes immediately downgradient of the Upper Ash Pond.

Sampling results from new monitoring well nest MW-307/307A and additional sampling from the existing CCR wells indicate:

- No arsenic GPS exceedances have been detected in groundwater samples from monitoring wells MW-307 or MW-307A. Well nest MW-307/MW-307A is located immediately downgradient from the Upper Ash Pond, on the groundwater flow path from the Upper Ash Pond and Landfill to well MW-302. Well nest MW-307/MW-307A has been sampled three times since it was installed in June 2021. The range of arsenic concentrations from all three sets of groundwater results were from below the detection limit (0.75 micrograms per liter [µg/L]) to 2.5 µg/L, which is below the GPS of 10 µg/L and well below the 30.8 µg/L to 53 µg/L range of arsenic concentrations detected in samples from well MW-302.

- Groundwater samples from MW-301 and MW-303, which are also located immediately downgradient from the Upper Ash Pond, have contained arsenic concentrations that range from 1.2 µg/L to 3.2 µg/L. Arsenic concentrations at these wells have been below the GPS in all sampling events since background monitoring began in 2015, consistent with the results for the more recently installed MW-307/MW-307A well nest.

- The sample from the combined groundwater and surface water outfall from the Upper Ash Pond[1] collected in June 2020 had an arsenic concentration of 2.33 µg/L (**Appendix C**). This is comparable to the arsenic concentrations for monitoring wells immediately downgradient from the Upper Ash Pond, including MW-301, MW-303, and MW-307.

- Monitoring results for MW-305, located approximately 300 feet downgradient of the Upper Ash Pond, have indicated arsenic concentrations that are below the GPS in all sampling events since sampling began at this well in July 2019.

[1] Eurofins. June 2020. Analytical Report Lansing NPDES Permit Renewal 2020, Project No. 50886, 21 pp.

- There are no arsenic SSLs in the downgradient delineation wells MW-306 and MW-306A. An arsenic result exceeding the GPS was also reported for new downgradient monitoring well MW-306 in the October 2019 event, but was not confirmed in the December 2019 resample.

- Groundwater monitoring results for other parameters are consistent with a transition to anoxic reducing conditions along the flow path from MW-307 to MW-302, including decreased oxidation-reduction potential (ORP), decreased sulfate, and increased iron concentrations.

- The ORP observed at MW-302 is -189 eV to -142 eV, indicating anoxic reducing conditions at the screened interval.

- The soil boring log for MW-302, shown in **Appendix B** indicated black silt at the depth of the well screen. The log for adjacent piezometer MW-302A indicated dark gray silt with roots at the same elevation. The black/dark gray color and roots are likely indications of organic content in the soil and samples taken from 9-25 feet bgs have measured total organic carbon (TOC) of 1.6 to 6.7 wt% (**Appendix C**). Anoxic reducing conditions are more common in organic soils due to oxygen consumed in degradation of organic materials.

- There are consistent downward gradients at well nests MW-302/MW-302A and MW-307/MW-307A. The consistent downward gradients indicate that water collected from MW-302 is not from a deeper flowpath from the upgradient Upper Ash Pond and Landfill CCR Units.

- Monitoring results from MW-302A, the piezometer adjacent to MW-302, have indicated arsenic concentrations below the method detection limit (< 0.88 μg/L) that have not shown any statistically significant increases above background conditions.

3.3.3 Updated Site Conceptual Model

Based on the additional investigations performed since the November 2020 ACM Addendum No. 1, the LAN Upper Ash Pond and Landfill are not the likely source of the SSLs above the GPS for arsenic at monitoring well MW-302.

Monitoring well MW-302 is the only well in the CCR rule monitoring system where arsenic has been detected at an SSL above the GPS. The monitoring well network includes wells installed both upgradient of MW-302, at the downgradient boundary of the Upper Ash Pond, and downgradient from MW-302, as well as a deeper piezometer installed immediately adjacent to MW-302. The lack of any arsenic concentrations that exceed the GPS, in several rounds of sampling, indicates that high arsenic concentrations found in MW-302 are specific to that location and not representative of a plume originating from the Ash Pond.

Additional discussion and supporting data for the determination that arsenic concentrations exceeding the GPS in samples from MW-302 are due to an alternative source are provided in **Appendix C**.

3.3.4 Potential Receptors and Pathways

As described in **Section 3.3**, ASTM E1689-95 provides a framework for identifying potential receptors (people or other organisms potentially affected by the groundwater impacts at LAN) and pathways

(the ways groundwater impacts might reach receptors). In accordance with ASTM E1689-95, we have considered both potential human and ecological exposures to groundwater impacted by arsenic, as identified in **Section 3.2.2**. The absence of completed exposure pathways does not alleviate the responsibility of IPL to select a remedy for groundwater impacts or complete an appropriate corrective action as required by 40 CFR 257.97-98 if a CCR Unit subject to the CCR Rule is the source of the impacts. However, an understanding of potential receptors and pathways may be helpful in evaluating and selecting a suitable remedy.

Human Health

In general, human health exposure routes to contaminants in the environment include ingestion, inhalation, and dermal contact with the following environmental media:

- Groundwater
- Surface Water and Sediments
- Air
- Soil
- Biota/Food

If people might be exposed to the impacts described in **Section 3.0** via one of the environmental media listed above, a potential exposure route exists and is evaluated further. For the groundwater impacts at LAN, the following potential exposure pathways have previously been identified with respect to human health and the discussion of each has been updated based on currently available data:

- **Groundwater – Ingestion and Dermal Contact.** The potential for ingestion of, or dermal contact with, impacted groundwater from LAN exists if water supply wells are present in the area of impacted groundwater and are used as a potable water supply. Based on a review of the IDNR GeoSam well database. and information provided by LAN:

  – No off-site water supply wells have been identified downgradient of the CCR Units.

  – A private supply well located across County Highway X52 from the landfill was sampled by Allamakee County in 2014 at the homeowner's request, and the sample was analyzed for arsenic. Arsenic was not detected in the sample. The Allamakee County Sanitarian stated that the well was 400 feet deep and under artesian pressure. IPL and SCS Engineers (SCS) are not aware of any additional samples from this well.

  – Two on-site water supply wells, Well #2 and Well #4, are currently used as sources of potable water.
    - Well #2 is 235 feet deep and is cased to 78 feet. Well #4 is 240 feet deep and is cased to 143 feet. Both wells are open to the sandstone aquifer.
    - The water supply operation permit for these wells (IDNR public water supply ID 0345181) requires sampling for inorganic constituents every 9 years. Arsenic was not detected in the most recent samples, collected on April 21, 2014.

    Both of these water supply wells will be abandoned as part of the plant decommissioning and will no longer be a potential pathway for exposure.

- **Surface Water and Sediments – Ingestion and Dermal Contact.** The potential for ingestion of or dermal contact with impacted surface water and sediments exists if impacted groundwater from the LAN facility has interacted with adjacent surface water and sediments, to the extent that arsenic is present in these media at concentrations that represents a risk to human health.

  – Surface water samples collected from the unnamed creek located downgradient from MW-302 in October 2021 and February 2022 did not contain arsenic above an applicable surface water standard. Furthermore, the arsenic concentrations in the two surface water samples were below the GPS and, in one sample from February 2022, below the detection limit (<0.75 µg/L). The concentration of arsenic in surface water samples collected near MW-302 is similar to background concentrations in groundwater and represents a similarly low risk from exposure. Based on the surface water sampling completed during the ACM process, the risk of exposure through ingestion or dermal contact with surface water is low and this is an unlikely pathway for exposure. The surface water samples and results are discussed in the arsenic assessment provided in **Appendix C**.

- **Biota/Food – Ingestion.** The potential for ingestion of impacted food exists if impacted groundwater from the facility has interacted with elements of the human food chain. Based on discussions with facility staff, no hunting or farming occurs within the current area of known groundwater impacts. Elements of the food chain may also be exposed indirectly through potential groundwater-to-surface water interactions, which are subject to additional assessment.

  – Based on surface water sampling completed during the ACM process, the risk of exposure through ingestion of impacted food is low. This is an unlikely pathway for exposure since the observed arsenic concentrations in surface water are similar to background water quality. Surface water in the area of MW-302 does not contain arsenic above an applicable surface water standard or the GPS. No further assessment was conducted based on the surface water sampling results.

Based on the lack of groundwater exposure and the additional surface water assessment, there is limited risk of exposure to the arsenic in groundwater at MW-302. However, the implementation of potential corrective measures may still introduce secondary exposure pathways that are discussed in **Section 6.0** and will be evaluated further as a corrective measure is selected for LAN.

Ecological Health

In addition to human exposures to impacted groundwater, potential ecological exposures are also considered. If ecological receptors might be exposed to impacted groundwater, the potential exposure routes are evaluated further. Ecological receptors include living organisms, other than humans, the habitat supporting those organisms, or natural resources potentially adversely affected by CCR impacts. This includes:

- Transfer from an environmental media to animal and plant life. This can occur by bioaccumulation, bioconcentration, and biomagnification:

  – Bioaccumulation is the general term describing a process by which chemicals are taken up by a plant or animal either directly from exposure to impacted media (soil, sediment, water) or by eating food containing the chemical.

  - Bioconcentration is a process in which chemicals are absorbed by an animal or plant to levels higher than the surrounding environment.

  - Biomagnification is a process in which chemical levels in plants or animals increase from transfer through the food web (e.g., predators have greater concentrations of a particular chemical than their prey).

- Benthic invertebrates within adjacent waters.

Based on the information available and presented in September 2019 ACM, both of the ecological exposure routes required additional evaluation at the time.

Since the September 2019 ACM was completed, exposure pathways subject to potential groundwater to surface water interactions have been evaluated further through the following:

- Review of state surface water standards for arsenic.

- Review of application materials and studies conducted by IPL for the renewal of the NPDES permit for LAN.

- Developing a hydrogeochemical conceptual model and a preliminary evaluation of arsenic attenuation (see Section 3.2.5).

- Sampling surface water downgradient of MW-302.

Based on our evaluation to date, the arsenic impacts to groundwater at LAN are unlikely to impact the river. This preliminary conclusion is based on the following:

- Surface water standards identified in our review are higher than the GPS for arsenic (see 567 Iowa Administrative Code Chapter 61 Water Quality Standards).

- Groundwater near the surface water interface is likely to transition from anaerobic to aerobic, which is expected to precipitate iron oxyhydroxides removing arsenic from solution by adsorption.

- Mussel communities in the channel adjacent to MW-302 and the Mississippi River were observed in support of the NPDES Permit renewal for LAN. The population of mussels, one of the most sensitive animal groups in the area were “characterized as balanced and indigenous,” which is not indicative of chronic or acute impacts (Alliant, 2020).

- Surface water samples collected in October 2021 and February 2022 did not contain arsenic at concentrations that exceed applicable surface water standards. The surface water samples contained arsenic at concentrations similar to background groundwater quality and below the GPS.

Our assessment indicates that arsenic in groundwater at LAN is unlikely having a negative impact on the Mississippi River or people and biota utilizing the river.

4.0 POTENTIAL CORRECTIVE MEASURES

In this section, we identify potential corrective measures to meet the ACM goals identified in 40 CFR 257.96(a), which are to:

- Prevent further releases
- Remediate releases
- Restore affected areas to original conditions

The development of corrective measure alternatives is described further in the following sections. Corrective measure alternatives previously developed to address the groundwater impacts at LAN are described in **Section 5.0**. The discussion of corrective measure alternatives has been updated since the CCR Units are no longer identified as the source of arsenic impacts. The alternatives are qualitatively evaluated in **Section 6.0**.

As required under 40 CFR 257.96(c), the following sections provide an analysis of the effectiveness of potential corrective measures. This evaluation includes the requirements and objectives identified in 40 CFR 257.97, which includes:

- The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to residual contamination;
- The time required to begin and complete the remedy; and
- The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy.

4.1 IDENTIFICATION OF CORRECTIVE MEASURES

As described in the U.S. EPA Solid Waste Disposal Facility Criteria Technical Manual (U.S. EPA, 1998), corrective measures generally include up to three components, including:

- Source Control
- Containment
- Restoration

Within each component, there are alternative measures that may be used to accomplish the component objectives. The measures from one or more components are then combined to form corrective measure alternatives (discussed in **Section 5.0**) intended to address the observed groundwater impacts. Potential corrective measures were identified based on site information available during development of the ACM for the purpose of meeting the goals described in **Section 4.0**.

Each component and associated corrective measures are further identified in subsequent paragraphs. The corrective measures are evaluated for feasibility and combined to create the corrective action alternatives identified in this section, and further evaluated in **Section 5.0**.

4.1.1 Source Control

The source control component of a corrective measure is intended to identify and locate the source of impacts and provide a mechanism to prevent further releases from the source. For this site, the previously identified sources to be controlled included the CCR materials in the landfill and impoundment, along with plant process water. Each of the source control measures below require closure of the landfill and impoundment, and for waste water to be re-directed from the CCR Units to eliminate the flows that may mobilize constituents from the CCR and transport them to groundwater.

With the updates to the groundwater assessment described in **Section 3.2**, the CCR Units are no longer identified as the source of groundwater impacts at LAN. However, with the cessation of coal-fired electric generating operations at LAN as of December 31, 2022, the CCR Units will be closed. Plant waste water discharges to the LAN Upper Ash Pond will also end in spring 2023 regardless of the corrective action process.

The following potential source control measures were identified in the ACM and subsequent addendums:

- **Cap in place**. Cap the CCR in uncovered areas of the existing landfill and the CCR surface impoundment in place to reduce the infiltration of rainwater into the impoundments, and prevent transport of CCR constituents from unsaturated CCR materials into the groundwater and reduce the potential for CCR to interface with groundwater. The landfill closure will be conducted according to the disposal permit issued by the IDNR.

- **Consolidate and cap**. Consolidate CCR from the surface impoundment into a smaller area adjacent to the landfill to reduce the cap area exposed to infiltration and reduce the potential source footprint. Install a cap over uncovered areas of the existing landfill, and the consolidated CCR from the surface impoundment to prevent transport of CCR constituents from unsaturated CCR materials into the groundwater and minimize the potential for CCR to interface with groundwater. The landfill closure will be conducted according to the disposal permit issued by the IDNR.

- **Consolidate and cap with chemical stabilization**. Consolidate CCR from the surface impoundment into a smaller area adjacent to the landfill to reduce the cap area exposed to infiltration, reduce the potential source footprint, prevent transport of CCR constituents from unsaturated CCR materials into the groundwater, and minimize the potential for CCR to interface with groundwater. Mix a chemical amendment into CCR in-situ prior to placing additional CCR for consolidation and mix the amendment into CCR as it is excavated and placed for consolidation to reduce the mobility of select CCR constituents in the environment. Chemical stabilization may include the use of one or multiple admixtures that serve to physically and/or chemically stabilize the constituents of concern within the CCR. Physically, this may include solidification with cementitious or polymeric materials. Chemically, this may include precipitation or alteration to render arsenic less mobile in the environment. Evaluation of an appropriate commodity amendment, that may include Calcium Polysulfide, Portland Cement, Calcium Oxide, and/or proprietary chemicals such as FerroBlack-H, MAECTITE, 3Dme, and/or MRC, will occur during the remedy selection process.

- **Excavate CCR and create on-site disposal area**. Excavate CCR from the landfill and surface impoundment and place CCR in a new lined disposal area on site to prevent further releases from the CCR and isolate the CCR from potential groundwater

interactions. Cap the new disposal area with final cover to prevent the transport of CCR constituents from unsaturated CCR.

- **Excavate impounded CCR and dispose at a licensed off-site disposal area**. Remove all CCR from the site and haul to a licensed landfill to prevent further releases from the CCR areas.

Water movement through the CCR materials is the mechanism for CCR impacts to groundwater, including surface water that moves vertically through the CCR materials via infiltration of precipitation and surface water runoff.

Based on the currently available information for this site the CCR Units are not the source of groundwater impacts. Thus, source control under the CCR Rule corrective action process is not required.

4.1.2 Containment

The objective of containment is to limit the spread of the groundwater impacts beyond the source. The need for containment depends on the nature and extent of impacts, exposure pathways, and risks to receptors. Containment may also be implemented in combination with restoration as described in **Section 4.1.3**.

Containment may be a recommended element of a corrective measure if needed to:

- Prevent off-site migration of groundwater impacts
- Cease completion of an exposure pathway (e.g., water supply well).

Containment may also be used in lieu of active restoration if an active approach is needed; however, containment with active treatment is not warranted when:

- Water in the affected aquifer is naturally unsuited for human consumption.
- Contaminants present in low concentration with low mobility.
- Low potential for exposure pathways to be completed, and low risk associated with exposure.
- Low transmissivity and low future user demand.

The following containment measures have potential to limit the spread of groundwater impacts at sites in corrective action, if necessary:

- **Gradient Control with Pumping**. Gradient control includes a measure to alter the groundwater velocity and direction to slow or isolate impacts. This can be accomplished with pumping wells and/or a trench/sump collection system. If groundwater pumping is considered for capturing an impacted groundwater plume, the impacted groundwater must be managed in conformance with all applicable Federal and State requirements.
- **Gradient Control with Phytotechnology**. Gradient control with phytotechnology relies on the ability of vegetation to evapotranspire sources of surface water and groundwater. Water interception capacity by the aboveground canopy and subsequent

evapotranspiration through the root system can limit vertical migration of water from the surface downward. The horizontal migration of groundwater can be controlled or contained using deep-rooted species, such as prairie plants and trees, to intercept, take up, and transpire the water. Trees classified as phreatophytes are deep-rooted, high-transpiring, water-loving organisms that send their roots into regions of high moisture and can survive in conditions of temporary saturation.

- Chemical Stabilization. Stabilization refers to processes that involve chemical reactions that reduce the leachability of arsenic. Stabilization chemically immobilizes impacts or reduces their solubility through a chemical reaction. The desired results of stabilization methods include converting metals into a less soluble, mobile, or toxic form.

- Containment Walls. Containment walls can be applied in two ways. First, a wall that creates a physical barrier to the flow of groundwater to limit the movement of constituents of concern in groundwater. Second, a passive barrier installed to intercept the flow of groundwater and constructed with a reactive media designed to adsorb, precipitate, or degrade groundwater constituents to limit their movement in the environment (FRTR, 2020).

Based on the currently available information for this site the CCR Units are not the source of groundwater impacts. Thus, active containment under the CCR Rule corrective action process is not required.

4.1.3 Restoration

Restoration is the process through which groundwater quality is restored to meet GPSs. This can be accomplished by way of Monitored Natural Attention (MNA) or intensively addressed by groundwater treatment with or without extraction.

MNA can be a viable remedy or component of a remedial alternative for groundwater impacted with metals. MNA requires ongoing involvement and potentially intense characterization of the geochemical environment to understand the attenuation processes involved, and to justify reliance on them and regular, long-term monitoring to ensure the attenuation processes are meeting remedial goals.

MNA is not a “do-nothing” alternative; rather it is an effective knowledge-based remedy where a thorough engineering analysis provides the basis for understanding, monitoring, predicting, and documenting natural processes. To properly employ this remedy, there needs to be a strong scientific basis supported by appropriate research and site-specific monitoring implemented in accordance with quality controls. The compelling evidence needed to support proper evaluation of the remedy requires that the processes that lower metal concentrations in groundwater be well understood.

If active treatment is implemented, water may be treated in-situ, on site, or off site. The need for active treatment depends on the nature and extent of impacts, potential exposure pathways, and current and anticipated future risks to receptors. If there are no receptors or if the risks are acceptably low, then MNA is an appropriate option. If existing or future risks require a more rapid restoration of groundwater quality, then active restoration may be needed.

Treated groundwater may be re-injected, sent to a local publicly owned treatment works (POTW), or discharged to a local body of surface water, depending on local, State, and Federal requirements.

Typical on-site treatment practices for metals include coagulation and precipitation, ion exchange, or reverse osmosis. Off-site wastewater treatment may include sending the impacted groundwater that is extracted to a local POTW or to a facility designed to treat the contaminants of concern.

The removal rate of groundwater constituents such as arsenic will depend on the rate of groundwater extraction, the cation exchange capacity of the soil, and partition coefficients of the constituents sorbed to the soil. As the concentration of metals in groundwater is reduced, the rate at which constituents become partitioned from the soil to the aqueous phase may also be reduced. The amount of flushing of the aquifer material required to remove the metals and reduce their concentration in groundwater below the GPS will generally determine the time frame required for restoration. This time frame is site-specific.

In-situ methods may be appropriate, particularly where pump and treat technologies may present adverse effects. In-situ methods may include the introduction of a chemical amendment to adsorb, precipitate, or degrade a contaminant or biological restoration requiring pH control, addition of specific micro-organisms, and/or addition of nutrients and substrate to augment and encourage degradation by indigenous microbial populations. Bioremediation requires laboratory treatability studies and pilot field studies to determine the feasibility and the reliability of full-scale treatment.

Based on the currently available information for this site the CCR Units are not the source of groundwater impacts. Thus, restoration under the CCR Rule corrective action process is not required.

5.0 CORRECTIVE MEASURE ALTERNATIVES

The following corrective measure alternatives for the groundwater impacts at LAN were identified in ACM Addendum No. 1:

- Alternative 1 – No Additional Action
- Alternative 2 – Close and Cap in Place with MNA
- Alternative 3 – Consolidate and Cap with MNA
- Alternative 4 – Excavate CCR and Dispose On Site with MNA
- Alternative 5 – Excavate CCR and Dispose Off Site with MNA
- Alternative 6 – Consolidate and Cap with Chemical Amendment
- Alternative 7 – Consolidate and Cap with Groundwater Collection
- Alternative 8 – Consolidate and Cap with Barrier Wall

These alternatives were developed by selecting components from the reasonable and appropriate corrective measures components discussed above. Capping areas of the landfill that are currently open is included with all potential source control measures. Each of the corrective measure alternatives meet the requirements in 40 CFR 257.97(b)(1) through (5) based on the information available at the current time and the conclusion that the CCR Units are not the source of groundwater impacts at LAN.

5.1 ALTERNATIVE 1 – NO ADDITIONAL ACTION

IPL is committed to implementing corrective measures as required under the Rule, and the No Additional Action alternative is included in this ACM Addendum No. 2 as a viable alternative based on the data summary provided in Section 3.0, which indicates the CCR Units are not the source of groundwater impacts above the GPS at LAN. The consideration of this alternative assumes the closure of the LAN Upper Ash Pond will proceed as described in the Closure Plan for Existing CCR

Surface Impoundment (currently Amendment No. 2 (SCS, 2020)) and in accordance with the requirements of 40 CFR 257.102(d), the LAN Landfill will be closed in accordance with the CCR Rule and existing State of Iowa sanitary disposal project permit, and groundwater monitoring will continue in accordance with 40 CFR 257.94.

5.2 ALTERNATIVE 2 – CLOSE AND CAP IN PLACE WITH MNA

Alternative 2 includes closing the landfill in accordance with the CCR Rule and existing State of Iowa sanitary disposal project permit and closing the CCR impoundment with no further discharge. CCR materials will be capped and vegetation established on the final cover in accordance with the requirements for closure in place in 40 CFR 257.102(d). This measure is consistent with landfill cover systems to prevent infiltration of surface water into the CCR as described in Section 4.1.1. The capped areas will be subject to enhanced groundwater monitoring via MNA.

This alternative eliminates CCR sluicing/plant process water discharges and, with the installation of a cap, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. Leaching of metals and migration within groundwater will be reduced and may be eliminated over time. MNA is included with this alternative to monitor changes in groundwater impacts and the effectiveness of degradation mechanisms on groundwater concentrations over time.

5.3 ALTERNATIVE 3 – CONSOLIDATE AND CAP WITH MNA

Alternative 3 includes closing the landfill in accordance with the CCR Rule and existing State of Iowa sanitary disposal project permit, and closing the CCR impoundment (no further discharge). The impounded CCR will be closed by relocating a portion of the impounded CCR and consolidating it into a smaller footprint within the CCR surface impoundment and/or landfill. The impounded CCR materials and currently open areas of the landfill will be capped in accordance with the requirements for closure in place in 40 CFR 257.102(d). This measure is consistent with landfill cover systems to prevent infiltration of surface water into the CCR as described in Section 4.1.1. The capped areas will be subject to enhanced groundwater monitoring via MNA.

This alternative eliminates CCR sluicing/plant process water discharges and, with the consolidation of the CCR footprint and the installation of a cap, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. Consolidation of CCR into a smaller footprint during closure also reduces the volume of potential source materials that may be in contact with groundwater after closure. Leaching of metals and migration within groundwater will be reduced and may be eliminated over time. MNA is included with this alternative to monitor changes in groundwater impacts and the effectiveness of degradation mechanisms on groundwater concentrations over time.

5.4 ALTERNATIVE 4 – EXCAVATE CCR AND DISPOSE ON SITE WITH MNA

Alternative 4 includes closing the landfill and impoundment (no further disposal or discharge), excavation of CCR from the landfill and surface impoundment, and creation of a new on-site disposal area with a liner and cap system. This alternative will serve to entomb the CCR at the site and allow for the collection and management of liquids generated from the new disposal area. Releases from the CCR will be prevented by the use of engineering controls constructed/installed to meet the

design criteria for new CCR landfills required under 40 CFR 257.70. The capped areas will be subject to enhanced groundwater monitoring via MNA.

This alternative eliminates CCR sluicing/plant process water discharges and, with the consolidation of the CCR footprint and the installation of a new on-site disposal area liner and cap, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. MNA is included with this alternative to monitor changes in groundwater impacts and the effectiveness of degradation mechanisms on groundwater concentrations over time.

5.5 ALTERNATIVE 5 – EXCAVATE CCR AND DISPOSE OFF SITE WITH MNA

Alternative 5 includes closing the landfill and impoundment (no further disposal or discharge), excavation of all CCR, and transport to an approved off-site landfill. Releases from the CCR sources will be prevented by relocating the source material to another site, which eliminates the potential for leaching of constituents in CCR into groundwater at LAN.

This alternative eliminates CCR sluicing/plant process water discharges and, with the removal of CCR from the site, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. MNA is included with this alternative to monitor changes in groundwater impacts and the effectiveness of degradation mechanisms on groundwater concentrations over time.

5.6 ALTERNATIVE 6 – CONSOLIDATE AND CAP WITH CHEMICAL AMENDMENT

Alternative 6 includes closing the landfill and impoundment (no further discharge), adding a chemical amendment to in-place CCR and relocated CCR to reduce the mobilization of contaminants prior to relocating and consolidating CCR into a smaller footprint within the CCR Units, covering the CCR materials with a cap, and establishing vegetation in accordance with the requirements for closure in place in 40 CFR 257.102(d). This measure is consistent with landfill cover systems to prevent infiltration of surface water into the CCR and the reduced contaminant mobilization achieved by chemical amendment as described in Section 4.1.1.

This alternative eliminates CCR sluicing/plant process water discharges and, with the consolidation of the CCR footprint and the installation of a cap, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. Consolidation of CCR into a smaller footprint during closure also reduces the volume of potential source materials that may be in contact with groundwater after closure. Leaching of metals and migration within groundwater will be reduced by minimizing the footprint of CCR in contact with groundwater and by fixation using a chemical amendment.

5.7 ALTERNATIVE 7 – CONSOLIDATE AND CAP WITH GROUNDWATER COLLECTION

Alternative 7 includes closing the landfill and impoundment (no further discharge), relocating and consolidating CCR into a smaller footprint within the CCR Units, covering the CCR materials with a

cap, and establishing vegetation in accordance with the requirements for closure in place in 40 CFR 257.102(d). This measure is consistent with landfill cover systems to prevent infiltration of surface water into the CCR as described in **Section 4.1.1**. Impacted groundwater will be collected using pumps and treated prior to discharge according to state and federal requirements as described in **Section 4.1.2**.

This alternative eliminates CCR sluicing/plant process water discharges and, with the consolidation of the CCR footprint and the installation of a cap, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. Consolidation of CCR into a smaller footprint during closure also reduces the volume of potential source materials that may be in contact with groundwater after closure. Leaching of metals and migration within groundwater will be reduced and may be eliminated over time as impacted groundwater is collected to contain and restore contaminant concentrations in groundwater to levels below the GPS.

5.8 ALTERNATIVE 8 – CONSOLIDATE AND CAP WITH BARRIER WALL

Alternative 8 includes closing the landfill and impoundment (no further discharge), relocating and consolidating CCR into a smaller footprint within the CCR Units, covering the CCR materials with a cap, and establishing vegetation in accordance with the requirements for closure in place in 40 CFR 257.102(d). This measure is consistent with landfill cover systems to prevent infiltration of surface water into the CCR as described in **Section 4.1.1**. Impacted groundwater will be intercepted with a barrier wall to minimize the migration of contaminants as described in **Section 4.1.2**.

This alternative eliminates CCR sluicing/plant process water discharges and, with the consolidation of the CCR footprint and the installation of a cap, will reduce infiltration through the CCR. This is expected to address the major contributor to potential groundwater impacts, which is exposure of CCR material to precipitation/surface water infiltration. Consolidation of CCR into a smaller footprint during closure also reduces the volume of potential source materials that may be in contact with groundwater after closure. Leaching of metals and migration within groundwater will be reduced and may be eliminated over time as impacted groundwater is intercepted with a barrier wall to minimize the spread of potential impacts to groundwater.

6.0 EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES

As required by 40 CFR 257.96(c), an evaluation of the effectiveness of corrective measure alternatives in meeting the requirements and objectives outlined in 40 CFR 257.97 was previously provided in the November 2020 ACM Addendum No. 1. Based on the data available at the time, the evaluation addressed the requirements and objectives identified in 40 CFR 257.96(c)(1) through (3), which include:

- The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to residual contamination;
- The time required to begin and complete the remedy; and
- The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy.

Based on the updated nature and extent of the groundwater impacts at LAN and the conclusion that the CCR Units are not the source of arsenic in groundwater at concentrations exceeding the GPS in samples from MW-302, an assessment of these factors is no longer a matter of CCR Rule compliance and will be addressed with state regulators, as such, the evaluation of corrective measure alternatives has not been updated for ACM Addendum No. 2 with the exception of Alternative 1 – No Action.

6.1 ALTERNATIVE 1 – NO ACTION

As described in **Section 5.1**, the No Action alternative is included because data obtained to complete ACM Addendum No. 2 indicates the CCR Units are not the source of groundwater impacts above the GPS at LAN. As such, the five criteria in 40 CFR 257.97(b)(1) through (5), do not apply. For completeness only, Alternative 1 is evaluated with regard to the criteria in 40 FR 257.96(c) below:

- **Performance, Reliability, Implementation, and Impacts**.
  - Performance – The ability to attain the GPS for arsenic is no longer subject to the CCR Rule and will be addressed with state regulators.
  - Reliability – Alternative 1 does not provide any reduction in existing risk.
  - Implementation – Nothing is required to implement Alternative 1.
  - Impacts – No additional safety or cross-media impacts are expected with Alternative 1.

- **Timing.** No time is required to begin.

- **Institutional Requirements**. No institutional requirements beyond maintaining current regulatory approvals exist for Alternative 1.

7.0 SUMMARY OF ASSESSMENT

Based on the currently available information for this site the CCR Units are not the source of groundwater impacts. Thus, corrective action will be addressed with state regulators.

8.0 REFERENCES

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Tables

Table 1. Groundwater Monitoring Well Network
Lansing Generating Station / SCS Engineers Project #25220082.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-6	Upgradient	Background
MW-301	Downgradient	Compliance
MW-302	Downgradient	Compliance
MW-302A	Downgradient, deeper	Delineation
MW-303	Downgradient	Compliance
MW-304	Downgradient	Delineation
MW-304A	Downgradient, deeper	Delineation
MW-305	Downgradient	Delineation
MW-306	Downgradient	Delineation
MW-306A	Downgradient, deeper	Delineation
MW-307	Downgradient	Delineation
MW-307A	Downgradient, deeper	Delineation
MW-308	Downgradient	Groundwater Elevation Only
MW-309	Downgradient	Groundwater Elevation Only

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Table 2. CCR Rule Groundwater Samples Summary
Lansing Generating Station / SCS Engineers

Sample Dates	Downgradient Wells											Background Well
	MW-301	MW-302	MW-302A	MW-303	MW-304	MW-304A	MW-305	MW-306	MW-306A	MW-307	MW-307A	MW-6
12/10/2015	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
4/29/2016	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
7/20/2016	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
10/26-27/2016	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
1/17-18/2017	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
4/19/2017	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
6/19-20/2017	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
8/15/2017	B	B	NI	B	NI	NI	NI	NI	NI	NI	NI	B
10/16/2017	D	D	NI	D	NI	NI	NI	NI	NI	NI	NI	D
4/16/2018	A	A	NI	A	NI	NI	NI	NI	NI	NI	NI	A
4/26/2018	--	--	NI	--	NI	NI	NI	NI	NI	NI	NI	A-R
6/4/2018	A-R	A-R	NI	A-R	NI	NI	NI	NI	NI	NI	NI	--
8/7/2018	A	A	NI	A	NI	NI	NI	NI	NI	NI	NI	A
10/8/2018	A	A	NI	A	NI	NI	NI	NI	NI	NI	NI	A
4/15/2019	A	A	NI	A	NI	NI	NI	NI	NI	NI	NI	A
6/20/2019	--	--	NI	--	A	NI	A	A	NI	NI	NI	--
10/2/2019	A	A	NI	A	A	NI	A	A	NI	NI	NI	A
12/5/2019	--	--	NI	--	--	NI	--	A-R	NI	NI	NI	--
2/5/2020	--	--	NI	--	--	NI	--	A-R	NI	NI	NI	A
5/19-20/2020	A	A	A	A	A	A	A	A	A	NI	NI	A
7/6/2020	--	--	A	A	--	A	--	--	A	NI	NI	--
8/18-19/2020	A-R	A-R	A-R	A-R	A-R	A-R	A-R	A-R	A-R	NI	NI	A-R
10/19/2020	A	A	A	A	A	A	A	A	A	NI	NI	A
2/23/2021	--	--	--	--	--	A-S	--	A-S	--	NI	NI	--
4/7-9/2021	A	A	A	A	A	A	A	A	A	NI	NI	A
7/12-13/2021	--	--	--	--	--	A-S	--	A-S	--	A-S	A-S	--
8/13/2021	--	--	--	--	--	--	--	--	--	A-S	A-S	--
10/25-27/2021	A	A	A	A	A	A	A	A	A	A	A	A
4/4-6/2022	A	A	A	A	A	A	A	A	A	A	A	A
10/17-19/2022	A	A	A	A	A	A	A	A	A	A	A	A

Abbreviations:
B = Background Sample Event
D = Detection Monitoring Program Event
-- = Not Applicable
A = Assessment Monitoring Sample Event
A-R = Assessment Monitoring Resample Event
A-S = Assessment Monitoring Supplemental Event
NI = Not Installed

Created by: NDK Date: 1/8/2018
Last revision by: RM Date: 3/22/2023
Checked by: NLB Date: 3/22/2023

I:\25220082.00\Deliverables\ACM Add No. 2\Tables\[Table 2 - GW_Samples_Summary_Table_LAN.xlsx]GW Summary

Table 3. Water Level Summary
Interstate Power & Light - Lansing, Iowa / SCS Engineers Project #25220082.00

Well Number	MW1[4]	MW2	MW3[3]	MW4	MW5	MW6	MW11	MW11R	MW12	MW12P	MW13	MW14	MW15	TW17	TW18	TW19	MW-16	MW-18	MW-19	MW-22	MW-22P	MW20	MW301	MW302	MW302A	MW303	MW304	MW304A	MW305	MW306	MW306A	MW307	MW-307A	MW308	MW309
Top of Casing Elevation (feet amsl)	636.67	657.36	656.78	698.17	698.46	741.33	686.19	686.42	691.40	691.58	658.38	646.06	656.82	659.59	659.15	659.05	700.26	771.09	716.07	702.55	702.17	662.29	641.61	638.40	638.93	656.27	636.43	638.60	633.87	637.48	639.56	643.06	642.96	637.89	638.27
Screen Length (ft)	20	10	10	10	10	10	10	10	15	5	15	15	15	15	15	15	15	15	15	15	5	10	10	10	5	10	10	5	10	10	5	10	5	10	10
Top of Well Screen Elevation (ft)	626.50	620.50	600.00	650.00	630.00	656.00	657.96	646.94	657.70	627.98	649.48	636.96	640.82	649.39	650.55	648.95	662.18	669.23	651.69	665.27	625.14	648.79	624.01	626.90	594.93	637.97	630.43	593.60	627.87	621.48	589.56	633.06	597.96	627.89	626.27
Measurement Date																																			
May 11, 2001	632.77	628.53	629.29	653.61	654.82	663.12	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
March 8, 2002	627.95	620.21	620.94	650.57	651.80	661.71	653.60	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
February 19, 2004	NM	NM	NM	648.80	650.05	653.27	648.03	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 26, 2004	NM	NM	NM	652.89	654.15	664.29	652.09	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
August 23, 2004	NM	NM	NM	652.15	653.38	662.65	650.04	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
November 18, 2004	NM	NM	NM	650.81	652.04	663.88	648.18	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 5, 2005	NM	NM	NM	650.42	651.67	661.80	647.77	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 19, 2006	NM	NM	NM	650.43	651.66	661.78	DRY	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 30, 2007	NM	NM	NM	650.21	651.43	661.69	DRY	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 16, 2008	NM	NM	NM	653.99	655.24	664.55	DRY	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 3, 2009	NM	NM	NM	655.72	656.95	666.16	DRY	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 21, 2010	NM	NM	NM	652.27	653.51	663.08	DRY	646.41	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 4, 2011	NM	NM	NM	653.51	654.75	663.84	DRY	646.58	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 25, 2012	NM	NM	NM	651.77	653.03	662.83	DRY	646.53	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 17, 2012	627.33	620.03	NM[2]	650.73	651.97	662.10	AB	646.16	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
February 19-20, 2013	627.03	620.03	621.26	650.72	651.96	662.13	AB	645.42	650.31	NI	643.72	641.93	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 1, 2013	627.80	620.68	621.79	652.24	653.46	664.16	AB	646.21	651.71	NI	644.61	641.36	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
July 1, 2013	631.57	625.88	626.68	661.13	662.31	673.12	AB	648.73	653.66	NI	648.43	642.43	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 29, 2014	629.84	NM	NM	654.17	655.43	664.86	AB	646.96	651.62	651.33	645.97	641.95	633.83	648.74	647.26	648.08	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 29, 2014	629.75	624.37	624.50	653.53	653.81	664.30	AB	646.53	651.05	650.73	645.39	641.43	633.61	648.14	646.55	646.96	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 20, 2015	628.16	620.09	620.78	652.00	653.24	663.30	AB	645.93	650.32	650.05	643.73	642.02	633.85	647.79	646.35	646.97	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
December 10, 2015	NM	NM	NM	NM	NM	662.28	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	648.27	623.54	627.88	NI	638.79	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 28, 2016	627.50	620.26	620.83	651.55	652.79	662.80	AB	645.96	650.05	650.00	643.56	641.56	634.71	647.78	NM[5]	646.80	NI	NI	NI	NI	NI	648.61	623.45	627.24	NI	638.15	NI	NI	NI	NI	NI	NI	NI	NI	NI
July 20, 2016	NM	NM	NM	NM	NM	663.21	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	649.86	624.76	628.60	NI	639.33	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 27, 2016	NM	NM	NM	NM	NM	670.82	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	651.32	624.97	628.35	NI	638.65	NI	NI	NI	NI	NI	NI	NI	NI	NI
January 18, 2017	NM	NM	NM	NM	NM	666.28	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	650.18	624.09	627.32	NI	638.10	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 19-21, 2017	629.39	622.04	622.02	658.84	660.00	669.82	AB	648.24	653.68	653.40	647.61	643.01	634.50	649.87	649.03	649.01	660.45	669.88	652.12	668.38	667.45	651.71	624.70	628.98	NI	639.20	NI	NI	NI	NI	NI	NI	NI	NI	NI
June 19-20, 2017	NM	NM	NM	NM	NM	670.65	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	650.22	624.89	627.75	NI	638.77	NI	NI	NI	NI	NI	NI	NI	NI	NI
August 15, 2017	NM	NM	NM	NM	NM	670.61	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	649.58	624.09	627.28	NI	637.86	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 16, 2017	NM	NM	NM	NM	NM	669.58	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	650.81	625.70	628.75	NI	638.79	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 16-17, 2018	628.63	620.82	617.50	AB	AB	667.64	AB	647.07	652.25	651.90	646.36	642.61	634.07	648.77	648.49	648.23	NM	NM	NM	NM	NM	650.77	624.29	628.98	NI	638.62	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 26, 2018	628.67	620.86	617.63	AB	AB	667.96	AB	647.47	651.75	652.54	646.38	645.46	634.14	648.99	648.35	648.00	656.61	667.79	650.19	666.28	665.17	651.18	624.56	628.75	NI	638.57	NI	NI	NI	NI	NI	NI	NI	NI	NI
June 4, 2018	NM	NM	NM	AB	AB	NM	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	624.62	628.27	NI	638.81	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 8, 2018	NM	NM	NM	AB	AB	664.71	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	625.73	628.59	NI	637.32	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 15-16, 2019	630.95	632.16	628.40	AB	AB	672.78	AB	648.69	654.35	653.99	649.45	643.08	633.71	649.73	648.47	648.10	NM	672.64	654.55	671.05	669.22	652.57	629.19	629.99	NI	638.22	NI	NI	NI	NI	NI	NI	NI	NI	NI
June 20, 2019	NM	NM	NM	AB	AB	NM	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NM	623.61	NI	629.12	623.05	NI	NI	NI	NI	NI
October 2, 2019	NM	NM	NM	AB	AB	675.54	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	652.64	626.54	630.04	NI	638.03	623.79	NI	629.77	622.47	NI	NI	NI	NI	NI
December 5, 2019	NM	NM	NM	AB	AB	NM	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NM	NM	NI	NM	620.60	NI	NI	NI	NI	NI
February 5, 2020	NM	NM	NM	AB	AB	NM	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NM	NM	NI	NM	620.83	NI	NI	NI	NI	NI
May 20-21, 2020	629.38	620.61	621.38	AB	AB	674.47	AB	648.17	654.45	654.04	647.94	643.23	633.80	648.82	648.86	649.40	661.08	674.36	656.06	672.16	670.46	650.20	624.46	627.68	623.19	637.98	621.57	624.88	627.24	620.43	620.40	NI	NI	NI	NI
July 6, 2020	NM	NM	NM	AB	AB	NM	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	624.20	NM	NM	625.76	NM	NM	621.66	NI	NI	NI	NI
August 19-21, 2020	NM	NM	NM	AB	AB	674.64	AB	NM	NM	NM	NM	NM	NM	NM		NM	NM	NM	NM	NM	NM	650.88	625.02	627.53	623.52	638.22	621.75	NM	626.98	620.37	620.63	NI	NI	NI	NI
October 19-20, 2020	628.69	620.38	621.22	AB	AB	673.37	AB	647.71	653.94	653.57	647.50	642.96	633.44	649.67	648.76	648.14	660.42	673.35	654.95	671.21	669.55	649.50	624.42	627.14	623.03	636.96	621.40	624.41	626.54	619.92	620.17	NI	NI	NI	NI
February 23, 2021	NM	NM	NM	AB	AB	NM	AB	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	625.04	NM	619.76	NM	NI	NI	NI	NI
April 7-9, 2021	628.84	620.55	621.36	AB	AB	671.08	AB	647.97	652.31	652.92	647.39	642.92	634.38	649.58	648.86	648.21	659.59	670.95	652.86	669.02	667.74	650.79	624.02	627.87	623.12	638.07	621.46	624.31	627.02	620.03	620.14	NI	NI	NI	NI
July 12-13, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	624.40	627.89	622.77	637.70	621.23	623.87	626.79	619.83	620.00	630.95	625.27	621.00	621.59
August 13, 2021	627.92	620.87	621.58	NM	NM	669.47	NM	647.22	652.57	652.31	646.79	NM	631.59	649.26	648.79	648.21	658.98	669.17	651.25	667.85	666.63	651.19	623.92	628.46	623.12	636.67	621.57	624.11	627.14	620.38	620.82	630.01	625.48	621.44	622.02
September 23, 2021	627.54	620.48	621.38	AB	AB	668.88	NM	647.28	652.46	652.12	646.53	642.79	632.44	649.12	648.65	647.96	658.72	668.58	650.77	667.12	665.96	650.46	624.33	627.65	622.85	637.62	621.20	623.74	626.44	619.95	620.28	631.74	625.28	621.09	621.92
October 25-27, 2021	627.51	620.48	621.19	AB	AB	668.14	AB	646.82	652.10	651.79	645.58	642.68	635.44	649.00	648.61	647.90	658.32	667.79	650.24	666.48	665.37	649.34	627.00	628.86	623.10	638.68	621.29	623.87	626.41	619.91	620.17	634.90	626.25	620.90	621.68
February 18, 2022	627.18	620.05	620.69	AB	AB	666.67	AB	647.19	651.83	651.42	645.95	642.67	638.17	648.93	648.58	647.83	657.69	666.36	649.16	665.06	664.10	649.81	629.46	629.87	623.09	641.17	621.19	623.59	626.42	619.59	619.90	638.27	626.12	620.66	621.42
April 4-7, 2022	627.65	620.66	621.36	AB	AB	667.14	AB	647.31	652.11	651.71	646.61	642.88	640.13	649.09	648.91	648.24	658.09	666.58	649.60	665.47	664.41	650.86	630.67	630.29	623.71	641.69	621.72	619.00	627.17	620.42	620.61	639.74	626.72	621.44	622.04
June 2, 2022	NM	NM	NM	NM	NM	NM	NM	646.78	651.73	651.37	645.41	642.58	635.53	NM	648.61	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
October 17-19 2022	627.05	620.12	620.91	AB	AB	665.34	AB	646.34	651.12	650.79	643.88	642.34	639.04	648.57	648.39	647.63	656.97	664.97	647.72	663.92	663.06	AB	630.79	629.51	622.97	639.39	621.21	623.56	626.36	619.79	620.05	639.23	625.77	621.78	621.96
Bottom of Well Elevation (ft)	606.50	610.50	590.00	640.47	620.36	646.03	647.59	636.94	642.70	622.98	634.48	621.96	625.82	634.39	635.55	633.95	647.18	654.23	636.69	650.27	620.14	638.79	614.01	616.90	589.93	627.97	620.43	588.60	617.87	611.48	584.56	623.06	592.96	617.89	616.27

Notes: NM = not measured NI = not installed AB = abandoned

1. The groundwater elevations recorded for MW11 on 2/19/04, 11/18/04, and 5/05/05 are not considered reliable due to a minimal quantity of water observed in the well. The actual water table elevation could be lower than the reported value.
2. MW3 could not be located during the October 2012 sampling event.
3. Repairs were completed at MW3 in July 2013. Elevations calculated for February, April, and July 2013 are estimates based on the old top of casing elevation (657.36 feet amsl). MW3 was re-surveyed on June 3, 2014.
4. MW1 was repaired in April 2013. Groundwater elevations measured before this date are calculated using the old top of casing elevation (637.60 ft amsl).
5. TW18 was damaged and could not be accessed for a water level measurement in April 2016. The well was repaired in July 2016.

Created by: MDB Date: 8/9/2013
Last revision by: EMS Date: 10/21/2022
Checked by: NDK Date: 10/21/2022

I:\25220082.00\Deliverables\ACM Add No. 2\Tables\[Table 2 - GW_Samples_Summary_Table_LAN.xlsx]GW Summary

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Background Well MW-6											
				10/16/2017	4/16/2018, 4/26/2018 ^	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/19/2020	8/19/2020	10/20/2020	4/7/2021	10/26/2021	4/6/2022
Appendix III															
Boron, ug/L	P*	100		41.2 J	29.8 J	42.9 J	40.2 J	<110	<110	<73	NA	<80	<58	64 J	<58
Calcium, mg/L	P	73.9		66.9	72.7	66.5	69.6	67	70	72	76	69	71	72	71
Chloride, mg/L	P	8.52		6.5	6.5	7.3	6.6	6.7	6.9	7.7	6.8	5.6	7.0	6.8	5.3
Fluoride, mg/L	P*	0.2		0.14 J	0.084 J	0.12 J	<0.19	0.63	<0.23	<0.23	NA	<0.23	0.34 J	<0.28	<0.22
Field pH, Std. Units	P	7.9		7.03	7.34	7.18	7.06	7.59	7.46	7.34	7.98	7.42	7.39	7.70	7.32
Sulfate, mg/L	P	29.4		25.8	26.4	24.8	25.5	26	24	27	25	25	23	25	25
Total Dissolved Solids, mg/L	P	386.7		318	343	351	319	340	280	580	NA	300	290	240	280
Appendix IV		**UPL**	**GPS**												
Antimony, ug/L	NP*	0.037	6	NA	<0.026	<0.15	<0.078	<0.53	NA	<0.58	NA	NA	<1.1	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	NA	0.23 J	0.26 J	0.24 J	<0.75	<0.75	<0.88	NA	<0.88	<0.75	<0.75	<0.75
Barium, ug/L	P	48.5	2,000	NA	44.1	43.1	43	43	46	46	NA	45	49 B	47	48
Beryllium, ug/L	DQ	DQ	4	NA	<0.012	<0.12	<0.089	<0.27	NA	<0.27	NA	NA	<0.27	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	NA	<0.018	NA	<0.033	<0.077	NA	<0.039	NA	<0.049	<0.051	<0.051	<0.055
Chromium, ug/L	P	1.20	100	NA	0.66 J	0.97 J	0.73 J	<0.98	<0.98	<1.1	NA	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	NA	<0.014	<0.15	<0.062	<0.091	<0.091	<0.091	NA	<0.091	<0.091	<0.19	<0.19
Fluoride, mg/L	P*	0.2	4	NA	0.084 J	0.12 J	<0.19	0.63	<0.23	<0.23	NA	<0.23	0.34 J	<0.28	<0.22
Lead, ug/L	NP*	0.13	15	NA	<0.033	<0.12	<0.13	<0.27	<0.27	<0.27	NA	<0.11	<0.21	<0.21	<0.24
Lithium, ug/L	NP*	3	40	NA	<4.6	NA	<4.6	<2.7	<2.7	<2.3	NA	<2.5	<2.5	<2.5	<2.5
Mercury, ug/L	DQ	DQ	2	NA	<0.090	<0.090	<0.090	<0.10	NA	<0.10	NA	NA	<0.15	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	NA	0.26 J	0.28 J	<0.57	<1.1	<1.1	<1.1	<1.1	<1.1	<1.3	<1.3	<1.2
Selenium, ug/L	P*	0.72	50	NA	0.47 J	0.5 J	0.46 J	<1.0	NA	<1.0	NA	<1.0	<0.96	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	NA	<0.036	NA	<0.099	<0.27	NA	<0.26	NA	NA	<0.26	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	NA	1.35	0.974	1.37	0.255	0.495	0.504	NA	0.644	0.359	0.779	0.0823
Additional Parameters - Selection of Remedy															
Arsenic, dissolved#, ug/L				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.75	NA
Calcium, ug/L				NA	NA	NA	NA	NA	NA	NA	NA	74,000	NA		NA
Iron, dissolved,# ug/L				NA	NA	NA	NA	NA	NA	NA	<50.0	<50.0	49 J	<36	<36
Iron, ug/L				NA	NA	NA	NA	NA	NA	NA	<50.0	<50.0	<36	<36	<36
Magnesium, ug/L				NA	NA	NA	NA	NA	NA	NA	38,000	37,000	36,000	35,000	35,000
Manganese, dissolved, ug/L#				NA	NA	NA	NA	NA	NA	NA	6.6 J	25	5.1 J	<4.4	14
Manganese, ug/L	UPL or GPS not applicable			NA	NA	NA	NA	NA	NA	NA	4	<4.0	<4.4	<4.4	<3.6
Molybdenum, dissolved,ug/L#				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, ug/L				NA	NA	NA	NA	NA	NA	NA	1.2	1,100	1,100	1,100	1,100
Sodium, ug/L				NA	NA	NA	NA	NA	NA	NA	5,000	4,500	4,600	4,500	4,500
Total Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	290	300	310	380	330
Carbonate Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	<3.8	<3.8	<4.4	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	290	300	310	380	330

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Compliance Wells MW-301 10/16/2017	4/16/2018, 6/4/2018 ^	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/19/2020	8/18/2020	10/19/2020	4/8/2021	10/26/2021	4/5/2022
Appendix III															
Boron, ug/L	P*	100		436	198.0	279	357	250	360	150	NA	260	160	260	220
Calcium, mg/L	P	73.9		65.9	64.5	65.1	72.5	73	68	56	65	57	58	68	69
Chloride, mg/L	P	8.52		17.3	20.2	17.7	15.9	17	14	17	15	15	18	17	22
Fluoride, mg/L	P*	0.2		0.24	0.24	0.23	0.27	0.9	0.23 J	0.56	NA	<0.23	0.38 J, F1	<0.28	<0.22
Field pH, Std. Units	P	7.9		7.66	8.4	8.08	8.16	8.47	8.11	7.85	8.33	8.06	8.04	8.11	8.30
Sulfate, mg/L	P	29.4		52.7	49.3	53.2	64.4	51	56	34	44	48	27 F1	49	86
Total Dissolved Solids, mg/L	P	386.7		289	300.0	326	320	350	310	480	NA	280	240	210	260
Appendix IV		**UPL**	**GPS**												
Antimony, ug/L	NP*	0.037	6	NA	0.071 J	0.16 J	0.085 J	<0.53	NA	<0.58	NA	NA	<1.1	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	NA	3.9	4.4	5.4	5.4	5.6	3.8	NA	6	5.0	7.1	4.9
Barium, ug/L	P	48.5	2,000	NA	163	156	155	160	180	140	NA	150	140 B	160	130
Beryllium, ug/L	DQ	DQ	4	NA	<0.012	<0.12	<0.089	<0.27	NA	<0.27	NA	NA	<0.27	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	NA	<0.018	NA	<0.033	<0.077	NA	<0.039	NA	<0.049	0.060 J	<0.051	<0.055
Chromium, ug/L	P	1.20	100	NA	1.1	<0.19	0.09 J	<0.98	<0.98	<1.1	NA	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	NA	0.086 J	0.16 J	0.11 J	0.11 J	0.11 J	0.11 J	NA	0.11 J	0.11 J	0.23 J	<0.19
Fluoride, mg/L	P*	0.2	4	NA	0.24	0.23	0.27	0.90	0.23 J	0.56	NA	<0.23	0.38 J, F1	<0.28	<0.22
Lead, ug/L	NP*	0.13	15	NA	0.037 J	<0.12	<0.13	<0.27	<0.27	<0.27	NA	<0.11	<0.21	0.37 J	<0.24
Lithium, ug/L	NP*	3	40	NA	<4.6	NA	9.1 J	8.7 J	8.0 J	7.0 J	NA	7.9 J	7.1 J	6.7 J	7.3 J
Mercury, ug/L	DQ	DQ	2	NA	0.31	<0.090	<0.090	<0.10	NA	<0.10	NA	NA	<0.15	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	NA	4.4	5.6	10.3	11	10	8.1	5.8	7.5	6.8	6.2	7.6
Selenium, ug/L	P*	0.72	50	NA	<0.086	0.22 J	0.18 J	<1.0	NA	<1.0	NA	<1.0	<0.96	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	NA	<0.036	NA	<0.099	<0.27	NA	<0.26	NA	NA	<0.26	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	NA	0.689	1.66	0.556	0.232	0.488	0.200	NA	0.889	0.244	0.814	0.103
Additional Parameters - Selection of Remedy															
Arsenic, dissolved[#], ug/L				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.8	NA
Calcium, ug/L				NA	NA	NA	NA	NA	NA	NA	NA	62,000	NA	NA	NA
Iron, dissolved,[#] ug/L				NA	NA	NA	NA	NA	NA	NA	330	110	320	430	280
Iron, ug/L				NA	NA	NA	NA	NA	NA	NA	680	500	740	640	620
Magnesium, ug/L				NA	NA	NA	NA	NA	NA	NA	19,000	18,000	19,000	18,000	21,000
Manganese, dissolved, ug/L[#]				NA	NA	NA	NA	NA	NA	NA	810	530	650	530	570
Manganese, ug/L	UPL or GPS not applicable			NA	NA	NA	NA	NA	NA	NA	800	560	670	530	590
Molybdenum, dissolved,ug/L[#]				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, ug/L				NA	NA	NA	NA	NA	NA	NA	3,200	3,600	2,600	3,700	3,000
Sodium, ug/L				NA	NA	NA	NA	NA	NA	NA	13,000	11,000	13,000	13,000	16,000
Total Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	200	160	220	260	200
Carbonate Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	<3.8	<3.8	<4.6	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	200	160	220	260	200

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Compliance Wells MW-302 10/16/2017	4/16/2018, 6/4/2018 ^	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/20/2020	8/19/2020	10/19/2020	4/9/2021	10/27/2021	4/5/2022
Appendix III															
Boron, ug/L	P*	100		708	489	648	694	690	690	480	NA	640	460	630	540
Calcium, mg/L	P	73.9		116	120	116	122	130	130	120	130	110	120	120	120
Chloride, mg/L	P	8.52		13.9	13.0	13.9	13.5	13	12	14	12	11	11	14	12
Fluoride, mg/L	P*	0.2		0.28	0.24	0.23	0.27	0.79	0.24 J	0.25 J	0.27 J	<0.23	0.31 J	1.3	<0.22
Field pH, Std. Units	P	7.9		7.1	7.26	6.92	6.93	7.66	7.15	6.93	7.18	7.06	7.08	6.89	6.92
Sulfate, mg/L	P	29.4		<0.5	<0.24	<0.24	<0.24	<1.8	<1.8	<3.6	<3.6	<3.6	<2.5	<2.5	<2.0
Total Dissolved Solids, mg/L	P	386.7		507	543	562	518	450	480	710	NA	490	470	450	490
Appendix IV		**UPL**	**GPS**												
Antimony, ug/L	NP*	0.037	6	NA	0.035 J	<0.15	<0.078	<0.53	NA	<0.58	NA	NA	<1.1	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	NA	30.8	47.6	50.4	37	53	33	NA	48	33	51	40
Barium, ug/L	P	48.5	2,000	NA	789	661	603	690	740	610	NA	630	630 B	680	690
Beryllium, ug/L	DQ	DQ	4	NA	<0.012	<0.12	<0.089	<0.27	NA	<0.27	NA	NA	<0.27	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	NA	<0.018	NA	<0.033	<0.077	NA	<0.039	NA	<0.049	0.060 J	0.076 J	<0.055
Chromium, ug/L	P	1.20	100	NA	0.35 J	0.49 J	0.39 J	<0.98	<0.98	<1.1	NA	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	NA	1.1	1.1	1.1	1.5	1.3	1.0	NA	0.86	1.00	1.1	1.5
Fluoride, mg/L	P*	0.2	4	NA	0.24	0.23	0.27	0.79	0.24 J	0.25 J	NA	<0.23	0.31 J	1.3	<0.22
Lead, ug/L	NP*	0.13	15	NA	0.084 J	0.23 J	<0.13	<0.27	<0.27	<0.27	NA	<0.11	<0.21	1.0	<0.24
Lithium, ug/L	NP*	3	40	NA	<4.6	NA	<4.6	<2.7	<2.7	<2.3	NA	<2.5	<2.5	<2.5	<2.5
Mercury, ug/L	DQ	DQ	2	NA	0.35	<0.090	<0.090	<0.10	NA	<0.10	NA	NA	<0.15	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	NA	0.91 J	1.2	1.5	<1.1	1.4 J	<1.1	<1.1	<1.1	1.7 J	1.4 J	<1.2
Selenium, ug/L	P*	0.72	50	NA	<0.086	0.3 J	0.26 J	<1.0	NA	<1.0	NA	<1.0	1.2 J	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	NA	<0.036	NA	<0.099	<0.27	NA	<0.26	NA	NA	2.5 B	0.31 J	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	NA	1.96	2.09	3.52	0.146	1.48	1.54	NA	1.41	1.57	1.59	1.35
Additional Parameters - Selection of Remedy															
Arsenic, dissolved[#], ug/L				NA	NA	NA	NA	NA	NA	NA	46	44	33	48	38
Calcium, ug/L				NA	NA	NA	NA	NA	NA	NA	NA	130,000	NA		
Iron, dissolved,[#] ug/L				NA	NA	NA	NA	NA	NA	NA	32,000	30,000	33,000	33,000	44,000
Iron, ug/L				NA	NA	NA	NA	NA	NA	NA	33,000	33,000	36,000	35,000	45,000
Magnesium, ug/L				NA	NA	NA	NA	NA	NA	NA	43,000	42,000	41,000	39,000	49,000
Manganese, dissolved, ug/L[#]				NA	NA	NA	NA	NA	NA	NA	2,800	2,500	2,400	2,600	3,000
Manganese, ug/L	UPL or GPS not applicable			NA	NA	NA	NA	NA	NA	NA	2,800	2,700	2,500	2,700	3,000
Molybdenum, dissolved,ug/L[#]				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, ug/L				NA	NA	NA	NA	NA	NA	NA	4,700	4,300	3,200	4,300	3,900
Sodium, ug/L				NA	NA	NA	NA	NA	NA	NA	17,000	17,000	16,000	18,000	21,000
Total Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	530	540	540	550	620
Carbonate Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	<7.6	<3.8	<4.6	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	NA	NA	NA	NA	NA	530	540	540	550	620

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Delineation Well MW-302A							Compliance Well MW-303											
				5/20/2020	7/6/2020	8/19/2020	10/19/2020	4/8/2021	10/27/2021	4/5/2022	10/16/2017	4/16/2018, 6/4/2018 ^	8/7/2018	10/8/2018	4/15/2019	10/2/2019	5/19/2020	8/18/2020	10/19/2020	4/9/2021	10/26/2021	4/5/2022
Appendix III																						
Boron, ug/L	P*	100		190	250	NA	160	170	140	170	592	144	675	474	150 J	520	150	NA	370	120	170	110
Calcium, mg/L	P	73.9		79	78	81	72	75	75	73	84.7	54.6	46.0	35.3	49	46	54	58	34	47	49	48
Chloride, mg/L	P	8.52		7.8	6.9	7.1	6	6.7	6.9	5.6	17.2	24.1	14.6	16.3	18	16	15	16	15	21	25	23
Fluoride, mg/L	P*	0.2		<0.23	<0.23	NA	<0.23	<0.28	<0.28	<0.22	0.25	0.32	0.47	0.72	1.0	0.42 J	0.38 J	NA	<0.23	0.52	<0.28	0.33 J
Field pH, Std. Units	P	7.9		7.27	7.22	7.41	7.33	7.25	7.15	7.34	7.20	8.00	7.66	7.91	7.95	7.83	7.67	7.65	7.77	8.00	7.45	8.07
Sulfate, mg/L	P	29.4		53	47	49	47	45	50	52	69.9	43.5	52.5	29.1	35	39	42	33	20	25	28	54
Total Dissolved Solids, mg/L	P	386.7		520	350	NA	350	330	280	300	379	296	262	181	280	210	450	NA	180	210	150	180
Appendix IV		**UPL**	**GPS**																			
Antimony, ug/L	NP*	0.037	6	<0.58	<0.51	NA	NA	<1.1	<1.1	<0.69	NA	0.16 J	0.34 J	0.19 J	<0.53	NA	<0.58	NA	NA	<1.1	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	<0.88	<0.88	NA	<0.88	<0.75	<0.75	<0.75	NA	1.2	2.3	2.3	1.4 J	2.5	1.4 J	NA	3.2	1.5 J	2.2	1.3 J
Barium, ug/L	P	48.5	2,000	51	47	NA	46	51 B	48	49	NA	173	194	121	160	220	210	NA	190.0	170 B	240	200
Beryllium, ug/L	DQ	DQ	4	<0.27	<0.27	NA	NA	<0.27	<0.27	<0.27	NA	0.046 J	<0.12	<0.089	<0.27	NA	<0.27	NA	NA	<0.27	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	<0.039	<0.049	NA	<0.049	<0.051	<0.051	<0.055	NA	<0.018	NA	<0.033	<0.077	NA	<0.039	NA	<0.049	<0.051	<0.051	<0.055
Chromium, ug/L	P	1.20	100	<1.1	<1.1	NA	1.2 J	<1.1	<1.1	<1.1	NA	0.51 J	0.44 J	0.089 J	<0.98	<0.98	<1.1	NA	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	0.41 J	0.098 J	NA	<0.091	<0.091	<0.19	0.45 J	NA	0.14 J	0.36 J	0.21 J	<0.091	0.12 J	<0.091	NA	0.098 J	<0.091	<0.19	<0.19
Fluoride, mg/L	P*	0.2	4	<0.23	<0.23	NA	<0.23	<0.28	<0.28	<0.22	NA	0.32	0.47	0.72	1.0	0.42 J	0.38 J	NA	<0.23	0.52	<0.28	0.33 J
Lead, ug/L	NP*	0.13	15	0.48 J	0.14 J	NA	<0.11	<0.21	0.22 J	<0.24	NA	<0.033	0.24 J	<0.13	<0.27	<0.27	<0.27	NA	<0.11	<0.21	<0.21	<0.24
Lithium, ug/L	NP*	3	40	<2.3	<2.5	NA	<2.5	<2.5	<2.5	<2.5	NA	<4.6	NA	8.1 J	3.3 J	9.1 J	4.2 J	NA	9.5 J	3.5 J	11	5.4 J
Mercury, ug/L	DQ	DQ	2	<0.10	<0.10	NA	NA	<0.15	<0.15	<0.11	NA	<0.090	<0.090	<0.090	<0.10	NA	<0.10	NA	NA	<0.15	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	<1.1	<1.1	<1.1	<1.1	<1.3	<1.3	<1.2	NA	7.3	21.6	12	6.2	9.8	3.1	23	10	4.8	7.1	9.2
Selenium, ug/L	P*	0.72	50	1.3 J	1.1 J	NA	<1.0	1.2 J	1.0 J	1.3 J	NA	3.3	0.38 J	0.39 J	<1.0	NA	1.4 J	NA	<1.0	1.1 J	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	<0.62	<0.26	NA	NA	<0.26	<0.26	<0.26	NA	<0.036	NA	<0.099	<0.27	NA	<0.26	NA	NA	<0.26	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	0.24	0.0963	NA	0.732	0.714	1.01	0.402	NA	0.787	0.929	1.87	0.543	0.463	0.131	NA	0.270	0.243	0.359	0.533
Additional Parameters - Selection of Remedy																						
Arsenic, dissolved#, ug/L				NA	NA	NA	NA	NA	<0.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	NA
Calcium, ug/L				NA	NA	NA	81,000	NA			NA	NA	NA	NA	NA	NA	NA	NA	35,000	NA		
Iron, dissolved,# ug/L				NA	NA	330	56 J	440	38 J	<36	NA	NA	NA	NA	NA	NA	NA	<50	<50	320	69 J	<36
Iron, ug/L				NA	NA	230	<50	47 J	41 J	<36	NA	NA	NA	NA	NA	NA	NA	<50	<50	<36	38 J	<36
Magnesium, ug/L				NA	NA	39, 000	38,000	37,000	35,000	37,000	NA	NA	NA	NA	NA	NA	NA	19,000	13,000	18,000	16,000	20,000
Manganese, dissolved, ug/L#				NA	NA	38	10	59	<4.4	8.3 J	NA	NA	NA	NA	NA	NA	NA	120	160	66	38	60
Manganese, ug/L	UPL or GPS not applicable			NA	NA	19	<4.0	4.5 J	<4.4	<3.6	NA	NA	NA	NA	NA	NA	NA	120	180	30	39	89
Molybdenum, dissolved,ug/L#				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, ug/L				NA	NA	1,200	1,000	1,000	1,000	1,100	NA	NA	NA	NA	NA	NA	NA	5,600	2,200	1,500	2,800	1,900
Sodium, ug/L				NA	NA	7,500	6,700	7,000	6,300	7,400	NA	NA	NA	NA	NA	NA	NA	13,000	12,000	13,000	15,000	16,000
Total Alkalinity, mg/L				NA	NA	290	300	300	300	330	NA	NA	NA	NA	NA	NA	NA	190	120	170	220	210
Carbonate Alkalinity, mg/L				NA	NA	<3.8	<3.8	<4.2	<4.6	<4.6	NA	NA	NA	NA	NA	NA	NA	<3.8	<3.8	<3.8	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	290	300	300	300	330	NA	NA	NA	NA	NA	NA	NA	190	120	170	220	210

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Delineation Wells																
				MW-304								MW-304A								
				6/20/2019	10/2/2019	5/20/2020	8/19/2020	10/19/2020	4/9/2021	10/26/2021	4/5/2022	5/20/2020	7/6/2020	8/19/2020	10/19/2020	2/23/2021	4/9/2021	7/12/2021	10/26/2021	4/5/2022
Appendix III																				
Boron, ug/L	P*	100		<110	<110	<73	NA	<80	64 J	<58	71 J	1,800	1,700	NA	1700	NA	1,400	NA	1,300	1,500
Calcium, mg/L	P	73.9		82	72	70	77	66	69	71	70	54	41	50	35	NA	43	NA	35	38
Chloride, mg/L	P	8.52		5.9	7.0	6.2	7.7	6.2	6.5	6.9	5.3	15	13	13	12	NA	13	NA	15	16
Fluoride, mg/L	P*	0.2		<0.23	<0.23	<0.23	NA	<0.23	<0.28	<0.28	<0.22	0.57	0.42 J	NA	<0.23	NA	0.53	NA	<0.28	0.32 J
Field pH, Std. Units	P	7.9		7.01	7.16	7.32	7.55	7.16	7.27	7.29	7.25	8.04	7.90	8.48	7.89	8.01	7.78	8.09	7.94	7.97
Sulfate, mg/L	P	29.4		20	17	17	15	16	15	18	20	83	77	76	76	NA	77	NA	91	87
Total Dissolved Solids, mg/L	P	386.7		350	300	470	NA	270	290	200	240	680	330	NA	310	NA	300	NA	240	270
Appendix IV		**UPL**	**GPS**																	
Antimony, ug/L	NP*	0.037	6	<0.53	NA	<0.58	NA	NA	<1.1	<1.1	<0.69	<0.58	<0.51	NA	NA	NA	<1.1	NA	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	<0.75	<0.75	<0.88	NA	<0.88	<0.75	<0.75	<0.75	1.3 J	<0.88	NA	<0.88	NA	0.78 J	NA	<0.75	<0.75
Barium, ug/L	P	48.5	2,000	54	47	42.0	NA	42.0	43 B	44	42	67.0	34.0	NA	28.0	NA	36.0 B	NA	26	30
Beryllium, ug/L	DQ	DQ	4	<0.27	NA	<0.27	NA	NA	<0.27	<0.27	<0.27	<0.27	<0.27	NA	NA	NA	<0.27	NA	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	<0.077	NA	<0.039	NA	<0.049	<0.051	<0.051	<0.055	0.19	0.098 J	NA	0.07 J	NA	0.096 J	NA	<0.051	0.074 J
Chromium, ug/L	P	1.20	100	1.6 J	1.0 J	8.2	NA	<1.1	<1.1	<1.1	<1.1	2.2 J	1.1 J	NA	<1.1	NA	1.6 J	NA	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	1.1	0.19 J	0.22 J	NA	<0.091	<0.091	0.22 J	<0.19	3.2	0.83	NA	0.43 J	NA	0.88	NA	<0.19	0.48 J
Fluoride, mg/L	P*	0.2	4	<0.23	<0.23	<0.23	NA	<0.23	<0.28	<0.28	<0.22	0.57	0.42 J	NA	<0.23	NA	0.53	NA	<0.28	0.32 J
Lead, ug/L	NP*	0.13	15	1.2	0.35 J	<0.27	NA	<0.11	<0.21	0.23 J	<0.24	4.3	1.2	NA	0.48 J	NA	1.1	NA	0.37 J	0.81
Lithium, ug/L	NP*	3	40	<2.7	<2.7	<2.3	NA	<2.5	<2.5	<2.5	<2.5	2.7 J	<2.5	NA	<2.5	NA	<2.5	NA	<2.5	<2.5
Mercury, ug/L	DQ	DQ	2	<0.10	NA	<0.10	NA	NA	<0.15	<0.15	<0.11	<0.10	<0.10	NA	NA	NA	<0.15	NA	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	<1.1	<1.1	<1.1	1.2 J	<1.1	<1.3	<1.3	2.7	110	140	140	130	120	110	100	120	120
Selenium, ug/L	P*	0.72	50	<1.0	NA	<1.0	NA	<1.0	<0.96	<0.96	<0.96	<1.0	<1.0	NA	<1.0	NA	<0.96	NA	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	<0.27	NA	<0.26	NA	NA	<0.26	<0.26	<0.26	<0.26	<0.26	NA	NA	NA	<0.26	NA	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	0.0356	0.900	0.0689	NA	0.139	0.497	0.870	0.143	0.630	0.573	NA	0.157	NA	0.468	NA	0.698	0.510
Additional Parameters - Selection of Remedy																				
Arsenic, dissolved[#], ug/L				NA	NA	NA	NA	NA	NA	<0.75	NA	NA	NA	NA	NA	NA	NA	NA	<0.75	NA
Calcium, ug/L				NA	NA	NA	NA	75,000	NA			NA	NA	NA	35,000	NA	NA	NA	NA	NA
Iron, dissolved,[#] ug/L				NA	NA	NA	<50.0	<50.0	<36	67 J	<36	NA	NA	<50	55 J	NA	<36	NA	<36	<36
Iron, ug/L				NA	NA	NA	51 J	<50.0	37 J	<36	<36	NA	NA	940	270	NA	580	NA	<36	240
Magnesium, ug/L				NA	NA	NA	36,000	35,000	33,000	32,000	33,000	NA	NA	21,000	16,000	NA	18,000	NA	15000	16,000
Manganese, dissolved, ug/L[#]				NA	NA	NA	6.9 J	4.1 J	10	<4.4	<3.6	NA	NA	16	7.3 J	NA	6.2 J	NA	<4.4	6.8 J
Manganese, ug/L	UPL or GPS not applicable			NA	NA	NA	11	6.0 J	5.9 J	<4.4	<3.6	NA	NA	99	26	NA	54	NA	<4.4	25
Molybdenum, dissolved,ug/L[#]				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	140	140	120	NA	120	130
Potassium, ug/L				NA	NA	NA	1,500	1,300	1,200	1,300	1,300	NA	NA	830	680	NA	710	NA	650	740
Sodium, ug/L				NA	NA	NA	5,600	6,100	4,900	4,000	5,900	NA	NA	69,000	63,000	NA	58,000	NA	55000	58,000
Total Alkalinity, mg/L				NA	NA	NA	300	310	300	370	320	NA	NA	190	190	NA	180	NA	210	210
Carbonate Alkalinity, mg/L				NA	NA	NA	<3.8	<3.8	<4.2	<4.6	<4.6	NA	NA	<7.6	<3.8	NA	<4.6	NA	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	NA	300	310	300	370	320	NA	NA	190	190	NA	180	NA	210	210

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Delineation Wells																			
				MW-305								MW-306											
				6/20/2019	10/2/2019	5/19/2020	8/18/2020	10/20/2020	4/9/2021	10/27/2021	4/4/2022	6/20/2019	10/2/2019	12/5/2019	2/5/2020	5/19/2020	8/18/2020	10/20/2020	2/23/2021	4/9/2021	7/12/2021	10/27/2021	4/4/2022
Appendix III																							
Boron, ug/L	P*	100		180 J	190 J	210	NA	220	140	200	110	860	660	NA	NA	720	NA	720	NA	650	NA	580	550
Calcium, mg/L	P	73.9		92	97	82	90	76	79	79	78	240	260	NA	NA	340	290	260	NA	290	NA	210	200
Chloride, mg/L	P	8.52		6.8	3.2 J	7.5	6.9	6	4.8 J	6.6	3.5 J	24	40	NA	NA	32	28	27	NA	33	NA	34	41
Fluoride, mg/L	P*	0.2		<0.23	<0.23	0.23 J	NA	<0.23	<0.28	<0.28	<0.22	<0.23	<0.23	NA	NA	<0.23	NA	<0.23	NA	<0.28	NA	<0.28	<0.22
Field pH, Std. Units	P	7.9		7.19	7.03	6.90	7.23	7.24	7.17	7.29	6.94	6.87	9.00	6.76	6.95	6.66	7.12	6.88	6.87	6.85	7.51	6.86	6.86
Sulfate, mg/L	P	29.4		24	26	<3.6	<3.6	<3.6	29	14	42	280	140	NA	NA	430	260	220	NA	240	NA	95	100
Total Dissolved Solids, mg/L	P	386.7		440	380	540	NA	320	300	260	270	1,200	1,300	NA	NA	3,400	NA	1,100	NA	1,300	NA	960	1,100
Appendix IV		**UPL**	**GPS**																				
Antimony, ug/L	NP*	0.037	6	<0.53	NA	<0.58	NA	NA	<1.1	<1.1	<0.69	<0.53	NA	NA	NA	<0.58	NA	NA	NA	<1.1	NA	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	2.2	3.4	3.6	NA	5.6	1.7 J	3.9	0.89 J	8.6	12	9.3	9.4	8.5	NA	10	9	8.0	8.2	8.6	7.7
Barium, ug/L	P	48.5	2,000	170	190	220	NA	200.0	150 B	200	97	280	540	NA	NA	260	NA	250	NA	280 B	NA	320	350
Beryllium, ug/L	DQ	DQ	4	<0.27	NA	<0.27	NA	NA	<0.27	<0.27	<0.27	<0.27	NA	NA	NA	<0.27	NA	NA	NA	<0.27	NA	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	<0.077	NA	<0.039	NA	<0.049	<0.051	<0.051	<0.055	<0.077	NA	NA	NA	<0.039	NA	<0.049	NA	<0.051	NA	<0.051	<0.055
Chromium, ug/L	P	1.20	100	<0.98	<0.98	<1.1	NA	<1.1	<1.1	<1.1	<1.1	<0.98	<0.98	NA	NA	<1.1	NA	<1.1	NA	1.3 J	NA	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	0.52	0.27 J	0.32 J	NA	0.12 J	0.29 J	<0.19	<0.19	1.0	0.98	NA	NA	0.53	NA	0.2 J	NA	0.35 J	NA	0.30 J	0.49 J
Fluoride, mg/L	P*	0.2	4	<0.23	<0.23	0.23 J	NA	<0.23	<0.28	<0.28	<0.22	<0.23	<0.23	NA	NA	<0.23	NA	<0.23	NA	<0.28	NA	<0.28	<0.22
Lead, ug/L	NP*	0.13	15	<0.27	<0.27	<0.27	NA	<0.11	<0.21	0.29 J	<0.24	0.52	<0.27	NA	NA	<0.27	NA	<0.11	NA	<0.21	NA	1.1	<0.24
Lithium, ug/L	NP*	3	40	3.4 J	4.6 J	<2.3	NA	<2.5	<2.5	<2.5	2.6 J	19	25	NA	NA	25	NA	26	NA	24	NA	22	23
Mercury, ug/L	DQ	DQ	2	<0.10	NA	<0.10	NA	NA	<0.15	<0.15	<0.11	<0.10	NA	NA	NA	<0.10	NA	NA	NA	<0.15	NA	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	1.7 J	1.6 J	<1.1	1.8 J	<1.1	<1.3	<1.3	<1.2	<1.1	<1.1	NA	NA	<1.1	<1.1	<1.1	NA	<1.3	NA	<1.3	<1.2
Selenium, ug/L	P*	0.72	50	<1.0	NA	<1.0	NA	<1.0	1.4 J	<0.96	1.7 J	<1.0	NA	NA	NA	<1.0	NA	<1.0	NA	<0.96	NA	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	<0.27	NA	<0.26	NA	NA	<0.26	<0.26	<0.26	<0.27	NA	NA	NA	<0.26	NA	NA	NA	<0.26	NA	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	0.553	0.557	0.837	NA	0.377	0.474	1.43	0.249	0.897	1.79	NA	NA	1.05	NA	1.16	NA	1.09	NA	2.10	0.757
Additional Parameters - Selection of Remedy																							
Arsenic, dissolved[#], ug/L	UPL or GPS not applicable			NA	NA	NA	NA	NA	NA	3.7	NA	NA	NA	NA	NA	NA	NA	NA	8.8	7.8	NA	8.4	7.8
Calcium, ug/L				NA	NA	NA	NA	87,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	280,000	NA	NA	NA		
Iron, dissolved,[#] ug/L				NA	NA	NA	11,000	10,000	3,700	6,900	830	NA	NA	NA	NA	NA	44,000	39,000	NA	41,000	NA	33,000	32,000
Iron, ug/L				NA	NA	NA	13,000	12,000	5,900	7,300	1,500	NA	NA	NA	NA	NA	43,000	40,000	NA	44,000	NA	33,000	33,000
Magnesium, ug/L				NA	NA	NA	32,000	32,000	25,000	30,000	23,000	NA	NA	NA	NA	NA	54,000	46,000	NA	50,000	NA	36,000	41,000
Manganese, dissolved, ug/L[#]				NA	NA	NA	2,000	1,800	1,100	1,400	520	NA	NA	NA	NA	NA	5,100	4,800	NA	5,300	NA	4,100	4,500
Manganese, ug/L				NA	NA	NA	2,000	1,800	1,200	1,500	560	NA	NA	NA	NA	NA	5,200	4,800	NA	5,500	NA	4,100	4,400
Molybdenum, dissolved,ug/L[#]				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium, ug/L				NA	NA	NA	2,200	1,800	1,300	1,600	1,500	NA	NA	NA	NA	NA	8,200	7,100	NA	6,100	NA	6200	7,000
Sodium, ug/L				NA	NA	NA	8,900	7,700	5,900	6,700	5,500	NA	NA	NA	NA	NA	110,000	110,000	NA	98,000	NA	140000	160,000
Total Alkalinity, mg/L				NA	NA	NA	340	340	280	330	290	NA	NA	NA	NA	NA	850	800	NA	880	NA	880	940
Carbonate Alkalinity, mg/L				NA	NA	NA	<7.6	<3.8	<4.6	<2.3	<4.6	NA	NA	NA	NA	NA	<7.6	<3.8	NA	<4.6	NA	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	NA	340	340	280	330	290	NA	NA	NA	NA	NA	850	800	NA	880	NA	880	940

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Delineation Wells															
				MW-306A							MW-307				MW-307A			
				5/19/2020	7/6/2020	8/18/2020	10/20/2020	4/9/2021	10/27/2021	4/4/2022	7/12/2021	8/13/2021	10/27/2021	4/5/2022	7/12/2021	8/13/2021	10/27/2021	4/5/2022
Appendix III																		
Boron, ug/L	P*	100		290	340	NA	280	280	240	260	220	250	280	400	370	380	300	430
Calcium, mg/L	P	73.9		83	82	86	76	78	80	78	55	47	38	50	67	62	70	58
Chloride, mg/L	P	8.52		7.8	7.1	7.4	7.2	7.2	7.7	6.3	15.0	16	17.0	22	6.8	7.2	8.1	13
Fluoride, mg/L	P*	0.2		<0.23	<0.23	NA	<0.23	<0.28	<0.28	<0.22	<0.28	<0.28 F1	<0.28	<0.22	<0.28	<0.28	<0.28	<0.22
Field pH, Std. Units	P	7.9		6.99	7.04	7.38	7.18	7.21	7.34	7.19	8.25	7.86	8.11	8.34	7.83	7.35	7.29	7.48
Sulfate, mg/L	P	29.4		44	40	41	41	39	42	43	44	42 F1	70	76	30	32	33	28
Total Dissolved Solids, mg/L	P	386.7		610	360	NA	350	350	280	330	210	230	130	210	280	290	230	250
Appendix IV		**UPL**	**GPS**															
Antimony, ug/L	NP*	0.037	6	<0.58	<0.51	NA	NA	<1.1	<1.1	<0.69	<1.1	<1.1	<1.1	<0.69	<1.1	<1.1	<1.1	<0.69
Arsenic, ug/L	P*	0.37	10	<0.88	<0.88	NA	<0.88	<0.75	<0.75	<0.75	2.1	2.4	2.5	1.8 J	<0.75	0.76 J	1.3 J	2.1
Barium, ug/L	P	48.5	2,000	61.0	58.0	NA	58.0	62.0 B	59	61	310	300	240	290	120	120	130	110
Beryllium, ug/L	DQ	DQ	4	<0.27	<0.27	NA	NA	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	<0.039	<0.049	NA	<0.049	<0.051	<0.051	<0.055	<0.051	<0.051	<0.051	<0.055	<0.051	<0.051	<0.051	<0.055
Chromium, ug/L	P	1.20	100	<1.1	<1.1	NA	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP*	0.34	6	0.33 J	0.18 J	NA	0.22 J	0.17 J	0.21 J	0.19 J	0.15 J	0.15 J	<0.19	<0.19	0.54	0.57	0.77	0.68
Fluoride, mg/L	P*	0.2	4	<0.23	<0.23	NA	<0.23	<0.28	<0.28	<0.22	<0.28	<0.28 F1	<0.28	<0.22	<0.28	<0.28	<0.28	<0.22
Lead, ug/L	NP*	0.13	15	<0.27	<0.11	NA	<0.11	<0.21	0.32 J	<0.24	<0.21	<0.21	<0.21	<0.24	<0.21	<0.21	0.21 J	<0.24
Lithium, ug/L	NP*	3	40	<2.3	<2.5	NA	<2.5	<2.5	<2.5	<2.5	13	13	12	10	<2.5	<2.5	<2.5	<2.5
Mercury, ug/L	DQ	DQ	2	<0.10	<0.10	NA	NA	<0.15	<0.15	<0.11	<0.15	<0.15	<0.15	<0.11	<0.15	<0.15	<0.15	<0.11
Molybdenum, ug/L	P*	0.37	100	<1.1	<1.1	<1.1	<1.1	<1.3	<1.3	<1.2	5.5	7.2	12	16	6.8	6.6	6.3	5.7
Selenium, ug/L	P*	0.72	50	<1.0	<1.0	NA	<1.0	<0.96	0.99 J	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96
Thallium, ug/L	NP*	0.29	2	<0.26	<0.26	NA	NA	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.88	5	1.12	0.525	NA	0.124	0.408	0.682	0.198	0.499	1.91	0.743	0.183	0.509	0.258	0.957	0.0954
Additional Parameters - Selection of Remedy																		
Arsenic, dissolved[#], ug/L	UPL or GPS not applicable			NA	NA	NA	NA	NA	<0.75	NA	2.0	NA	2.6	NA	<0.75	NA	1.4 J	NA
Calcium, ug/L				NA	NA	NA	85,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, dissolved,[#] ug/L				NA	NA	1,900	1,600	1,600	1,500	1,500	110	NA	110	87 J	<36	NA	170	280
Iron, ug/L				NA	NA	2,100	1,900	1,800	1,800	1,700	140	NA	95 J	78 J	<36	NA	160	370
Magnesium, ug/L				NA	NA	38,000	37,000	35,000	33,000	36,000	17,000	NA	12,000	17,000	33,000	NA	33,000	27,000
Manganese, dissolved, ug/L[#]				NA	NA	1,200	1,100	1,100	1,000	1,000	300	NA	240	560	600	NA	720	700
Manganese, ug/L				NA	NA	1,200	1,100	1,100	1,000	1,000	310	NA	230	590	620	NA	720	710
Molybdenum, dissolved,ug/L[#]				NA	NA	NA	NA	NA	NA	NA	5.2	NA	NA	NA	7.3	NA	NA	NA
Potassium, ug/L				NA	NA	1,400	1,200	1,200	1,200	1,300	3,600	NA	2,600	2,400	3,000	NA	2,500	2,100
Sodium, ug/L				NA	NA	12,000	11,000	10,000	9,800	10,000	13,000	NA	11,000	16,000	16,000	NA	14,000	22,000
Total Alkalinity, mg/L				NA	NA	330	320	320	330	350	170	NA	86	130	310	NA	310	330
Carbonate Alkalinity, mg/L				NA	NA	<7.6	<1.9	<4.6	<4.6	<4.6	<4.1	NA	<2.3	<4.6	<4.2	NA	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				NA	NA	330	320	320	330	350	170	NA	86	130	310	NA	310	330

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17	Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

See Page 8 for abbreviations and notes.

Table 4A. Groundwater Analytical Results Summary - October 2017 through April 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Abbreviations:

UPL = Upper Prediction Limit
NA = Not Analyzed
µg/L = micrograms per liter
mg/L = milligrams per liter

LOD = Limit of Detection
LOQ = Limit of Quantitation

DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric UPL (highest background value)
P = Parametric UPL with 1-of-2 retesting
GPS = Groundwater Protection Standard

J = Estimated concentration at or above the LOD and below the LOQ.
F1 = MS and/or MSD recovery exceeds control limits.
B = Compound was found in the blank and sample.
# = Dissolved parameter samples collected for MNA data review

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level above the GPS. The arsenic GPS exceedances at MW-302 have been determined to be statistically significant. The arsenic GPS exceedance at MW-306 has been determined not to be statistically significant. The molybdenum GPS exceedance has either been determined not to be statistically significant or the determination is ongoing. See the accompanying report text for additional information regarding determinations of statistical significance.
2. GPS is the United States Environmental Protection Agency (US EPA) Maximum Contamination Level (MCL), if established; otherwise, the value from 40 CFR 257.95(h)(2) is used.
3. Interwell UPLs calculated based on results from background well MW-6.

Created by:	NDK	Date:	5/1/2018
Last revision by:	RM	Date:	3/21/2023
Checked by:	NLB	Date:	3/22/2023
Proj Mgr QA/QC:	TK	Date:	5/28/2023

Table 4B. Groundwater Analytical Results Summary - October 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

Parameter Name	UPL Method	UPL	GPS	Background Well	Compliance Wells		Delineation Well	Compliance Well	Delineation Wells						
				MW-6	MW-301	MW-302	MW-302A	MW-303	MW-304	MW-304A	MW-305	MW-306	MW-306A	MW-307	MW-307A
				10/18/2022	10/17/2022	10/19/2022	10/17/2022	10/17/2022	10/17/2022	10/17/2022	10/18/2022	10/19/2022	10/19/2022	10/18/2022	10/18/2022
Appendix III															
Boron, ug/L	NP	110		<58	260	780	190	590	78 J	1,600	240	600	290	1100	680
Calcium, mg/L	P	73.7		70	67	110	74	42	79	37	80	280	77	39	52
Chloride, mg/L	P	8.13		5.1	15	11	5.2	17	8.6	16	5.5	32	5.8	18	11
Fluoride, mg/L	P	0.304		<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Field pH, Std. Units	P	7.98		7.40	8.10	6.87	7.28	7.66	7.17	7.81	7.32	6.8	7.25	8.44	7.59
Sulfate, mg/L	P	28.0		21	63	<2.0	44	58	14	69	3.6 J	500	34	120	27
Total Dissolved Solids, mg/L	NP	580		250	280	520	310	200	290	270	300	1,500	350	900	270
Appendix IV	**UTL Method**	**UTL**	**GPS**												
Antimony, ug/L	NP	1.1	6	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69
Arsenic, ug/L	NP	4.5	10	<0.75	5.0	51	<0.75	1.9 J	<0.75	<0.75	4.7	7.1	<0.75	2.7	1.9 J
Barium, ug/L	P	50.2	2,000	49	160	790	50	230	49	29	230	390	62	280	100
Beryllium, ug/L	DQ	DQ	4	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
Cadmium, ug/L	DQ	DQ	5	<0.055	<0.055	<0.055	<0.055	<0.055	<0.055	0.076 J	<0.055	<0.055	<0.055	<0.055	<0.055
Chromium, ug/L	P	1.10	100	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP	0.50	6	<0.19	<0.19	1.2	<0.19	<0.19	<0.19	0.88	<0.19	0.30 J	<0.19	0.19 J	0.65
Fluoride, mg/L	NP	0.63	4	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22
Lead, ug/L	NP	1.9	15	<0.24	<0.24	0.39 J	<0.24	<0.24	<0.24	1.1	<0.24	<0.24	<0.24	<0.24	<0.24
Lithium, ug/L	NP	4.9	40	<2.5	8.7 J	<2.5	<2.5	10	<2.5	<2.5	<2.5	27	<2.5	13	<2.5
Mercury, ug/L	DQ	DQ	2	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, ug/L	NP	1.5	100	<1.2	12	1.2 J	<1.2	22	2.1	130	<1.2	<1.2	<1.2	25	6.6
Selenium, ug/L	NP	5.8	50	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96	<0.96
Thallium, ug/L	NP	0.50	2	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	1.29	5	1.29	0.830	4.33	0.371	0.512	0.0692	0.296	1.20	0.693	1.18	1.51	0.683
Additional Parameters - Selection of Remedy															
Arsenic, dissolved[#], ug/L	UPL or GPS not applicable			--	--	50	--	--	--	--	--	7	--	--	--
Iron, dissolved,[#] ug/L				<36	410 F1	40,000	55 J	46 J	<36	<36	7,400	41,000	1,400	90 J	300
Iron, ug/L				<36	620	43,000	<36	<36	<36	380	8,500	42,000	1,500	110	330
Magnesium, ug/L				32,000	18,000	42,000	32,000	13,000	34,000	14,000	30,000	46,000	32,000	11,000	24,000
Manganese, dissolved, ug/L[#]				<3.6	590	2,500	5.4 J	110	<3.6	<3.6	1,400	7,000	1,000	450	640
Manganese, ug/L				<3.6	640	2,300	<3.6	220	<3.6	31	1,300	5,500	940	430	610
Molybdenum, dissolved,ug/L[#]				--	--	--	--	--	--	140	--	--	--	--	--
Potassium, ug/L				930	3,200	3,900	900	3,100	1,400	540	1,500	8,300	1,000	2,900	2,000
Sodium, ug/L				4,100	14,000	19,000	6,800	15,000	6,300	49,000	7,000	140,000	9,100	24,000	28,000
Total Alkalinity, mg/L				300	230	540	290	120	330	180	360	800	350	100	270
Carbonate Alkalinity, mg/L				<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
Bicarbonate Alkalinity, mg/L				300	230	540	290	120	330	180	360	800	350	100	270

See Page 2 for abbreviations and notes.

Table 4B. Groundwater Analytical Results Summary - October 2022
Lansing Generating Station / SCS Engineers Project #25220082.00

4.4	Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.
30.8	Yellow highlighted cell indicates the compliance well result exceeds the GPS.
17.0	Grayscale indicates additional parameters sampled for selection of remedy and evaluation of MNA.

Abbreviations:

UPL = Upper Prediction Limit
UTL = Upper Tolerance Limit
µg/L = micrograms per liter
mg/L = milligrams per liter
LOD = Limit of Detection
LOQ = Limit of Quantitation
P = Parametric
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric
GPS = Groundwater Protection Standard
-- = Not Analyzed

J = Estimated concentration at or above the LOD and below the LOQ.

Notes:

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant increase above the GPS. See the accompanying letter text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (US EPA) Maximum Contamination Level (MCL), if established; otherwise, the value from 40 CFR 257.95(h)(2) is used.
3. Interwell UPLs and UTLs calculated based on results from background well MW-6.

Created by:	NDK	Date:	4/10/2021
Last revision by:	SCC	Date:	1/1/2023
Checked by:	RM	Date:	1/3/2022
Sci QA/QC:	TK	Date:	2/3/2023

Table 5. Field Monitoring Data
Lansing Generating Station
October 2017 - October 2022

Well	Parameter	Field pH (Std. Units)	Field Oxidation Potential (mV)	Field Specific Conductance (umhos/cm)	Field Temperature (deg C)	Groundwater Elevation (feet)	Oxygen, Dissolved (mg/L)	Turbidity (NTU)
MW-6	10/16/2017	7.03	282.0	591	10.2	669.58	8.80	0.00
	4/26/2018	7.34	34.6	569	11.1	667.96	3.46	0.81
	8/7/2018	7.18	233.0	609	10.5	668.13	7.40	1.77
	10/8/2018	7.06	119.0	587	11.5	664.71	9.10	0.01
	4/15/2019	7.59	274.0	618	10.0	672.78	8.70	0.75
	10/2/2019	7.46	88.9	590	10.0	675.54	10.29	0.70
	5/20/2020	7.34	119.6	597	10.0	674.47	9.20	0.01
	8/19/2020	7.98	113.9	597	9.8	674.64	9.45	0.00
	10/20/2020	7.42	68.5	576	9.7	673.37	8.23	0.00
	4/7/2021	7.39	186.2	599	10.0	671.08	9.06	0.00
	10/26/2021	7.70	136.2	601	9.9	668.14	9.34	0.00
	4/6/2022	7.32	197.7	599	8.9	667.14	8.92	0.00
	10/18/2022	7.40	47.3	552.6	9.7	665.34	8.16	0.60
MW-301	10/16/2017	7.66	-221.0	497	17.0	625.70	0.00	0.05
	4/16/2018	8.39	-40.0	505	9.5	624.29	1.00	8.31
	6/4/2018	8.10	-145.5	507	12.2	624.62	0.89	2.72
	8/7/2018	8.08	-149.0	524	14.6	624.51	0.20	5.50
	10/8/2018	8.16	-180.0	545	17.4	625.73	0.30	9.19
	4/15/2019	8.47	-171.0	539	11.3	629.19	0.20	9.33
	10/2/2019	8.11	-156.8	502	15.6	626.54	0.13	1.36
	5/19/2020	7.85	-77.6	474	11.3	624.46	0.75	1.39
	8/18/2020	8.33	-115.3	476	15.0	625.02	0.16	1.65
	10/19/2020	8.06	-97.0	489	14.7	624.42	0.42	0.75
	4/8/2021	8.04	-10.1	461	11.5	624.02	0.27	0.00
	10/26/2021	8.11	-159.7	534	16.1	627.00	0.10	0.81
	4/5/2022	8.30	200.0	554	8.7	630.67	0.15	0.00
	10/17/2022	8.10	-185.1	526.0	12.5	630.79	0.08	1.31

Table 5. Field Monitoring Data
Lansing Generating Station
October 2017 - October 2022

Well	Parameter	Field pH (Std. Units)	Field Oxidation Potential (mV)	Field Specific Conductance (umhos/cm)	Field Temperature (deg C)	Groundwater Elevation (feet)	Oxygen, Dissolved (mg/L)	Turbidity (NTU)
MW-302	10/16/2017	7.10	-179.0	1045	16.2	628.75	0.00	3.96
	4/16/2018	7.26	-152.0	1098	6.0	628.98	0.80	5.25
	6/4/2018	6.97	-179.3	1068	10.8	628.27	0.12	1.46
	8/7/2018	6.92	-164.0	1095	15.3	627.62	0.10	11.23
	10/8/2018	6.93	-43.9	1039	17.0	628.59	0.48	5.92
	4/15/2019	7.66	-159.0	1089	7.1	629.99	0.20	18.39
	10/2/2019	7.15	-160.0	1049	15.9	630.04	0.11	4.71
	5/20/2020	6.93	-161.5	1070	8.7	627.68	0.19	4.16
	8/19/2020	7.18	-173.0	1039	16.2	627.53	0.05	4.00
	10/19/2020	7.06	-182.5	1074	14.4	627.14	0.10	2.96
	4/9/2021	7.08	-171.2	1043	7.5	627.87	0.03	3.15
	10/27/2021	6.89	-128.1	1075	15.7	628.86	1.07	3.35
	4/5/2022	6.92	202.8	1151	6.3	623.29	0.13	3.21
	10/19/2022	6.87	-186.2	1045.0	14.5	629.51	0.03	23.33
MW-302A	5/20/2020	7.27	126.9	644	11.7	623.19	6.55	11.90
	7/6/2020	7.22	47.0	641	11.7	624.20	6.60	4.68
	8/19/2020	7.41	74.1	638	11.8	623.52	6.23	0.19
	10/19/2020	7.33	125.4	650	11.4	623.03	6.46	0.58
	4/9/2021	7.25	104.7	597	11.1	623.12	7.88	0.86
	10/27/2021	7.15	159.1	627	12.0	623.10	7.27	0.00
	4/5/2022	7.34	199.7	630.0	10.2	623.71	6.49	0.00
	10/17/2022	7.28	105.7	619.9	11.6	622.97	6.27	1.39

Table 5. Field Monitoring Data
Lansing Generating Station
October 2017 - October 2022

Well	Parameter	Field pH (Std. Units)	Field Oxidation Potential (mV)	Field Specific Conductance (umhos/cm)	Field Temperature (deg C)	Groundwater Elevation (feet)	Oxygen, Dissolved (mg/L)	Turbidity (NTU)
MW-303	10/16/2017	7.20	49.0	687	25.2	638.79	1.90	0.00
	4/16/2018	8.00	53.0	552	4.1	638.62	3.50	0.40
	6/4/2018	7.59	68.0	431	17.0	638.81	0.36	1.08
	8/7/2018	7.66	-71.0	425	31.5	637.85	0.40	4.51
	10/8/2018	7.91	139.0	328	28.5	637.32	0.40	2.62
	4/15/2019	7.95	-76.0	448	4.2	638.22	1.40	6.60
	10/2/2019	7.83	156.0	409	25.2	638.03	0.27	0.58
	5/19/2020	7.67	28.9	464	6.3	637.98	1.29	0.00
	8/18/2020	7.65	25.8	468	30.4	638.22	0.15	1.62
	10/19/2020	7.77	38.4	340	23.5	636.96	0.58	0.00
	4/8/2021	8.00	78.4	425	3.7	638.07	2.03	0.00
	10/26/2021	7.45	125.8	452	24.8	638.68	0.17	0.65
	4/5/2022	8.07	202.1	452.4	4.6	641.69	1.17	0.00
	10/17/2022	7.66	25.5	397.1	23.1	639.39	0.11	2.07

Table 5. Field Monitoring Data
Lansing Generating Station
October 2017 - October 2022

Well	Parameter	Field pH (Std. Units)	Field Oxidation Potential (mV)	Field Specific Conductance (umhos/cm)	Field Temperature (deg C)	Groundwater Elevation (feet)	Oxygen, Dissolved (mg/L)	Turbidity (NTU)
MW-304	6/20/2019	7.01	41.0	593	10.6	623.61	6.20	104.00
	10/2/2019	7.16	107.3	578	12.4	623.79	7.51	3.51
	5/20/2020	7.32	104.9	574	9.0	621.57	7.78	3.72
	8/19/2020	7.55	109.6	583	11.8	621.75	6.76	1.06
	10/19/2020	7.16	155.6	602	11.8	621.40	6.84	0.42
	4/9/2021	7.27	160.3	520	8.8	621.46	8.69	0.00
	10/26/2021	7.29	171.3	562.3	12.1	621.29	8.32	0.00
	4/5/2022	7.25	201.4	571.8	8.2	621.72	7.20	0.00
	10/17/2022	7.17	169.2	643.3	11.9	621.21	6.97	0.01
MW-304A	5/20/2020	8.04	61.8	529	12.6	624.88	0.48	585.90
	7/6/2020	7.90	-15.8	541	19.1	625.76	0.30	181.90
	8/19/2020	8.48	50.5	533	14.0	--	0.27	236.20
	10/19/2020	7.89	162.7	547	10.1	624.41	0.78	90.29
	2/23/2021	8.01	44.9	534	9.1	625.04	0.39	116.60
	4/9/2021	7.78	151.6	533	10.1	624.31	0.41	165.20
	7/12/2021	8.09	80.3	543.1	13.8	623.87	0.48	36.09
	10/26/2021	7.94	157.1	526.8	13.4	623.87	2.53	2.78
	4/5/2022	7.97	198.1	520.9	9.4	619.00	0.19	42.65
	10/17/2022	7.81	-24.7	480.6	10.6	623.56	0.13	77.88

Table 5. Field Monitoring Data
Lansing Generating Station
October 2017 - October 2022

Well	Parameter	Field pH (Std. Units)	Field Oxidation Potential (mV)	Field Specific Conductance (umhos/cm)	Field Temperature (deg C)	Groundwater Elevation (feet)	Oxygen, Dissolved (mg/L)	Turbidity (NTU)
MW-305	6/20/2019	7.19	27.0	638	15.5	629.12	0.20	9.60
	10/2/2019	7.03	-105.6	635	19.0	629.77	0.21	8.87
	5/19/2020	6.90	-138.0	684	9.8	627.24	0.48	20.44
	8/18/2020	7.23	-162.9	654	19.0	626.98	0.07	27.27
	10/20/2020	7.24	-145.4	634	15.6	626.54	0.22	3.65
	4/9/2021	7.17	-25.8	574	7.1	627.02	2.10	14.88
	10/27/2021	7.29	-128.5	643	16.3	626.41	0.08	0.27
	4/4/2022	6.94	198.9	545.0	4.4	627.17	4.06	4.57
	10/18/2022	7.32	-186.6	607.2	15.7	626.36	0.06	8.17
MW-306	6/20/2019	6.87	22.0	1632	13.8	623.05	1.00	25.90
	10/2/2019	9.00	-1205.0	1998	16.3	622.47	0.27	3.67
	12/5/2019	6.76	-127.0	2196	16.3	620.60	0.90	10.26
	2/5/2020	6.95	-127.7	2477	13.7	620.83	0.23	4.43
	5/19/2020	6.66	-137.0	2332	12.7	620.43	0.30	2.63
	8/18/2020	7.12	-139.1	1,911	15.0	620.37	0.10	0.16
	10/20/2020	6.88	-142.3	1,832	16.2	619.92	0.26	3.08
	2/23/2021	6.87	-127.2	2,055	13.6	619.76	0.12	3.11
	4/9/2021	6.85	-134.2	1,994	12.6	620.03	0.05	0.09
	7/12/2021	7.51	-128.3	2,006	14.4	619.83	0.37	0.13
	10/27/2021	6.86	-126.3	1,778	16.6	619.91	0.11	2.72
	4/4/2022	6.86	196.3	1839	12.0	620.42	0.26	0.00
	10/19/2022	6.80	-173.1	2120.0	15.4	619.79	0.07	0.98

Table 5. Field Monitoring Data
Lansing Generating Station
October 2017 - October 2022

Well	Parameter	Field pH (Std. Units)	Field Oxidation Potential (mV)	Field Specific Conductance (umhos/cm)	Field Temperature (deg C)	Groundwater Elevation (feet)	Oxygen, Dissolved (mg/L)	Turbidity (NTU)
MW-306A	5/19/2020	6.99	-21.7	697	14.6	620.40	1.18	4.15
	7/6/2020	7.04	-55.8	683	15.3	621.66	1.24	1.40
	8/18/2020	7.38	21.2	654	15.5	620.63	1.16	2.71
	10/20/2020	7.18	-38.5	681	14.4	620.17	1.30	1.56
	4/9/2021	7.21	-8.5	669	14.2	620.14	1.68	0.01
	10/27/2021	7.34	78.8	663	14.6	620.17	1.23	0.59
	4/4/2022	7.19	192.7	669	13.0	620.61	1.13	0.00
	10/19/2022	7.25	-91.1	624.3	14.0	620.05	1.30	3.21
MW-307	7/12/2021	8.25	-40.6	449.6	15.2	630.95	0.47	0.00
	8/12/2021	7.86	-17.5	437	17.4	630.01	0.17	0.00
	10/27/2021	8.11	-123.4	361.2	16.4	634.90	0.93	0.00
	4/5/2022	8.34	198.2	460	6.9	639.74	0.08	0.00
	10/18/2022	8.44	-175.6	399.6	15.7	639.23	0.16	4.34
MW-307A	7/12/2021	7.83	73.1	615.6	13.2	625.27	0.27	0.00
	8/12/2021	7.35	54.3	612.3	12.5	625.48	0.17	0.00
	10/27/2021	7.29	47.7	625.4	12.9	626.25	1.39	0.00
	4/5/2022	7.48	199.8	563	10.8	626.72	0.09	0.00
	10/18/2022	7.59	-99.4	518.7	11.4	625.77	0.10	2.57

Created by: RM 3/21/2023
Last revision by: RM 3/21/2023
Checked by: NLB 3/22/2023

Table 6. Horizontal Gradients and Flow Velocity
Lansing Generating Station
SCS Engineers Project #25220082.00

	Flow Path A - North-Northwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
April 4-7, 2022: Shallow	646.61	640	928	0.007	0.5
October 17-19, 2022: Shallow	643.88	640	856	0.005	0.3
October 17-19, 2022: Deep	625.77	622	504	0.007	0.57

	Flow Path B - Northwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
April 4-7, 2022: Deep	626.72	620	364	0.018	1.40

Well	**K Values (cm/sec)**	**K Values (ft/d)**
MW-6	N/A	N/A
MW-301	1.75E-03	5.0
MW-302	3.50E-03	9.9
MW-302A	2.03E-02	57
MW-303	2.19E-02	62
MW-304	1.68E-02	48
MW-304A	2.55E-03	7.2
MW-305	3.38E-03	9.6
MW-306	4.46E-02	126
MW-306A	3.04E-02	86
MW-307	4.03E-02	114
MW-307A	9.66E-03	27
Geometric Mean	1.1E-02	30

Assumed Porosity, n
0.40

Groundwater flow velocity equation: $V = [K*(\Delta h/\Delta l)] / n$

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity
h1, h2 = point interpreted groundwater elevation at locations 1 and 2
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient

Note:
1.See Figures 3, 4, 5, and 6 for velocity calculation flow path locations.

Created by: NDK Date: 9/26/2022
Last revision by: RM Date: 1/13/2023
Checked by: MDB Date: 1/16/2023

Table 7. Vertical Gradients
Lansing Generating Station / SCS Engineers Project #25220082.00
January - December 2022

Vertical Hydraulic Gradients	MW302/MW302A		MW304/MW304A		MW306/MW306A		MW307/MW307A	
Shallow Well	MW302		MW304		MW306		MW307	
Screen midpoint[(2)] (feet amsl)	621.90		625.43		616.48		628.06	
Deep Well	MW302A		MW304A		MW306A		MW307A	
Screen midpoint (feet amsl)	592.43		591.10		587.06		595.46	
Measurement Date	**Distance between midpoints[(2)] (ft)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints[(2)] (ft)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints[(2)] (ft)**	**Vertical Gradient (ft/ft)**	**Distance between midpoints[(2)] (ft)**	**Vertical Gradient (ft/ft)**
February 23, 2021	NM	NM	NM	NM	NM	NM	NI	NI
April 7-9, 2021	29.5	-0.161	29.8	0.095	28.7	0.004	NI	NI
July 12-13, 2021	29.5	-0.174	29.7	0.089	28.6	0.006	31.5	-0.180
August 13, 2021	29.5	-0.181	29.9	0.085	28.9	0.015	31.1	-0.146
September 23, 2021	29.5	-0.163	29.7	0.085	28.7	0.012	31.9	-0.202
October 25-27, 2021	29.5	-0.195	29.8	0.087	28.6	0.009	33.5	-0.258
April 4-7, 2022	29.5	-0.223	30.0	-0.091	28.9	0.007	32.6	-0.399
October 17-19, 2022	29.5	-0.222	29.7	0.079	28.6	0.009	32.6	-0.413

Notes:
1: A positive vertical gradient indicates upward groundwater flow. A negative gradient indicates downward flow.
2: MW-304 and MW-306 are water table wells, and their screens were not fully submerged during all 2022 sampling events. The effective screen midpoint for a water table well is calculated for each sampling event as the midpoint between the water table elevation and the screen bottom elevation, and this value is used to calculate Distance Between Midpoints.
NI: Not Installed
NM: Not Measured

Created by:	TK	Date:	10/23/2020
Last revision by:	RM	Date:	1/16/2023
Checked by:	MDB	Date:	1/16/2023

Table 8. Historical Groundwater Arsenic Results for State Monitoring Wells
Alliant-Lansing CCR Landfill
(Results are in µg/L, unless otherwise noted)

Sample	Date	Arsenic (µg/L)
MW3	5/11/2001	<1.8
MW4	5/11/2001	<1.8
	3/8/2002	<0.88
	2/19/2004	<3.5
	5/26/2004	3.3
	8/23/2004	<0.79
	11/18/2004	<0.79
	5/5/2005	<0.79
	5/19/2006	2.9
	5/30/2007	<1
	4/16/2008	<0.43
	4/3/2009	0.27 J
	4/21/2010	<1.0
	5/4/2011	<1.0
	5/4/2011 (Dup)	<2.0 RL
	4/25/2012	<1.0
	4/2/2013	<1.0
	7/2/2013	<1.0
	4/29/2014	0.62 J
	5/29/2014	<0.18
	4/21/2015	<0.25
	4/28/2016	0.30 J
	4/20/2017	0.33 J
MW5	3/8/2002	<0.88
	2/19/2004	<3.5
	5/26/2004	4.7
	8/23/2004	0.92
	11/18/2004	<0.79
	5/5/2005	<0.79
	5/19/2006	<0.79
	5/30/2007	<1
	4/16/2008	<0.43
	04/16/08 (Dup)	<0.43
	4/3/2009	0.22 J
	4/21/2010	<1.0
	4/21/2010 (Dup)	<1.0
	5/4/2011	<1.0
	4/25/2012	<1.0
	4/2/2013	<1.0
	7/2/2013	<1.0
	4/29/2014	0.65 J
	5/29/2014	1.3
	4/21/2015	<0.25
	4/28/2016	0.26 J
	4/20/2017	0.26 J

Table 8. Historical Groundwater Arsenic Results for State Monitoring Wells
Alliant-Lansing CCR Landfill
(Results are in µg/L, unless otherwise noted)

Sample	Date	Arsenic (µg/L)
MW6	5/11/2001	<1.8
	3/8/2002	<0.88
	2/19/2004	<3.5
	5/26/2004	3.9
	8/23/2004	<0.79
	11/18/2004	<0.79
	5/5/2005	<0.79
	5/19/2006	0.93 J
	5/30/2007	<1.0
	4/16/2008	<0.43
	4/3/2009 (Dup)	0.29 J
	4/3/2009	0.29 J
	4/21/2010	<1.0
	5/4/2011	<1.0
	4/25/2012	<1.0
	4/2/2013	<1.0
	7/2/2013	<1.0
	4/29/2014	0.55 J
	4/20/2015	<0.25
	4/29/2016	0.26 J
	4/19/2017	0.27 J
	4/16/2018	0.19 J
	4/15/2019	<0.75
	5/20/2020	<0.88
	4/7/2021	<0.75
	4/6/2022	<0.75
MW11	3/8/2002	**23**
	5/26/2004	**16**
	8/23/2004	3.8
MW11R	4/21/2010	2.44
	5/4/2011	**11.6**
	4/25/2012	**13.6**
	4/25/2012 (Dup)	**15.7**
	4/2/2013	**25**
	7/2/2013	**23**
	4/30/2014	**27**
	5/29/2014	**27**
	4/21/2015	**23**
	4/28/2016	**33.4**
	4/20/2017	**30.4**
	4/17/2018	**28.5**
	4/16/2019	**28**
	5/21/2020	**33**
	4/7/2021	**33**
	4/7/2022	**29**

Table 8. Historical Groundwater Arsenic Results for State Monitoring Wells
Alliant-Lansing CCR Landfill
(Results are in µg/L, unless otherwise noted)

Sample	Date	Arsenic (µg/L)
MW12	4/2/2013	**16**
	7/2/2013	**17**
	4/30/2014	**16**
	5/29/2014	**14**
	4/21/2015	**13**
	4/28/2016	**24.2**
	4/20/2017	**19.4**
	4/17/2018	**20.6**
	4/16/2019	**20**
	5/21/2020	**21**
	4/6/2021	**21**
	4/6/2022	**23**
MW12P	4/30/2014	1.0
	5/29/2014	0.45 J
	4/21/2015	0.34 J
	4/28/2016	0.44 J
	4/20/2017	0.88 J
	4/17/2018	0.51 J
	4/16/2019	<0.75
	5/21/2020	<0.88
	4/6/2021	<0.75
	4/6/2022	<0.75
MW13	4/2/2013	1.1
	7/2/2013	<1.0
	7/2/2013 (Dup)	<1.0
	4/30/2014	1.6
	5/29/2014	0.65 J
	4/20/2015	1.1
	4/28/2016	3.5
	4/20/2017	1.5
	4/17/2018	0.89 J
	4/16/2019	<0.75
	5/21/2020	<0.88
	4/7/2021	<0.75
	4/7/2022	<0.75
MW14	4/2/2013	<1.0
	7/2/2013	<1.0
	4/30/2014	0.54 J
	5/29/2014	<0.18
	4/20/2015	<0.25
	4/29/2016	0.16 J
	4/20/2017	0.68 J
	4/17/2018	0.16 J
	4/15/2019	<0.75
	5/22/2020	<0.88
	4/7/2021	<0.75
	4/6/2022	<0.75

Table 8. Historical Groundwater Arsenic Results for State Monitoring Wells
Alliant-Lansing CCR Landfill
(Results are in µg/L, unless otherwise noted)

Sample	Date	Arsenic (µg/L)
MW15	4/30/2014	0.95 J
	5/29/2014	0.82 J
	4/20/2015	0.79 J
	4/29/2016	0.39 J
	4/20/2017	0.42 J
	4/17/2018	0.14 J
	4/16/2019	<0.75
	5/22/2020	<0.88
	4/7/2021	<0.75
	4/7/2022	<0.75
TW17	4/30/2014	0.87 J
	5/29/2014	0.25 J
TW18	4/30/2014	1.40
	5/29/2014	<0.18
	4/20/2015	0.47 J
	4/20/2017	1.2
	4/17/2018	2.1
	4/16/2019	<0.75
	5/22/2020	<0.88
	4/7/2021	<0.75
	4/6/2022	<0.75
TW19	4/30/2014	4.6
	5/29/2014	0.59 J
Rinsate Blank	3/8/2002	0.88
	5/26/2004	3.3
	8/23/2004	0.79
	11/18/2004	0.79
	4/16/2008	0.43
	4/3/2009	2.0
Groundwater Protection Standard (GPS)		10

Abbreviations:
µg/L = micrograms per liter

Notes:
Bold+underlined values meet or exceed GPS.
Italic+underlined values meet or exceed USEPA SMCL.

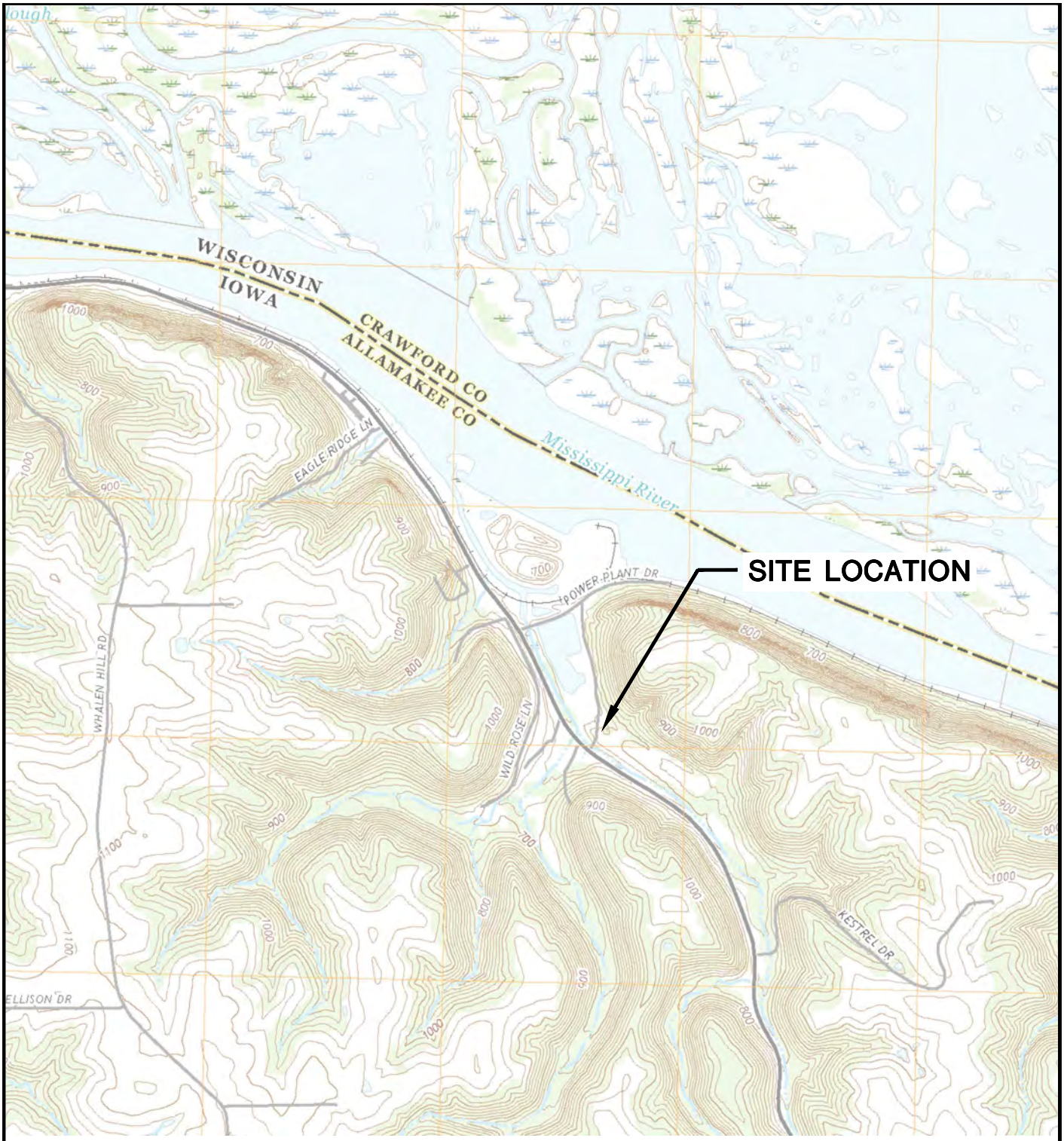
Laboratory Notes/Qualifiers:
B = Analyte was detected in the associated Method Blank.
CL = The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
D = Diluted for analysis.
D9 = Dissolved result is greater than the total. Data is within laboratory control limits.
H1 = Analysis conducted outside the EPA method holding time.
J = Estimated value. Analyte detected at a level less than the reporting limit and greater than or equal to the Method Detection Limit. The user of this data should be aware that this data is of unknown quality.

M1 = Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2 = The lab does not hold TNI accreditation for this parameter.
RL = Reporting limit raised due to sample matrix effects.

Created by:	TLC	Date:	8/20/2013
Last revision by:	RM	Date:	3/21/2023
Checked by:	NLB	Date:	3/22/2023

I:\25220082.00\Deliverables\ACM Add No. 2\Tables\[Table 8 - Historical State GW Arsenic.xlsx]Notes

Figures



N

LANSING QUADRANGLE
IOWA–ALLAMAKEE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	INTERSTATE POWER AND LIGHT 2320 POWER PLANT DRIVE LANSING, IA 52151-9733	SITE	ALLIANT ENERGY LANSING GENERATING STATION LANSING, IOWA

SITE LOCATION MAP

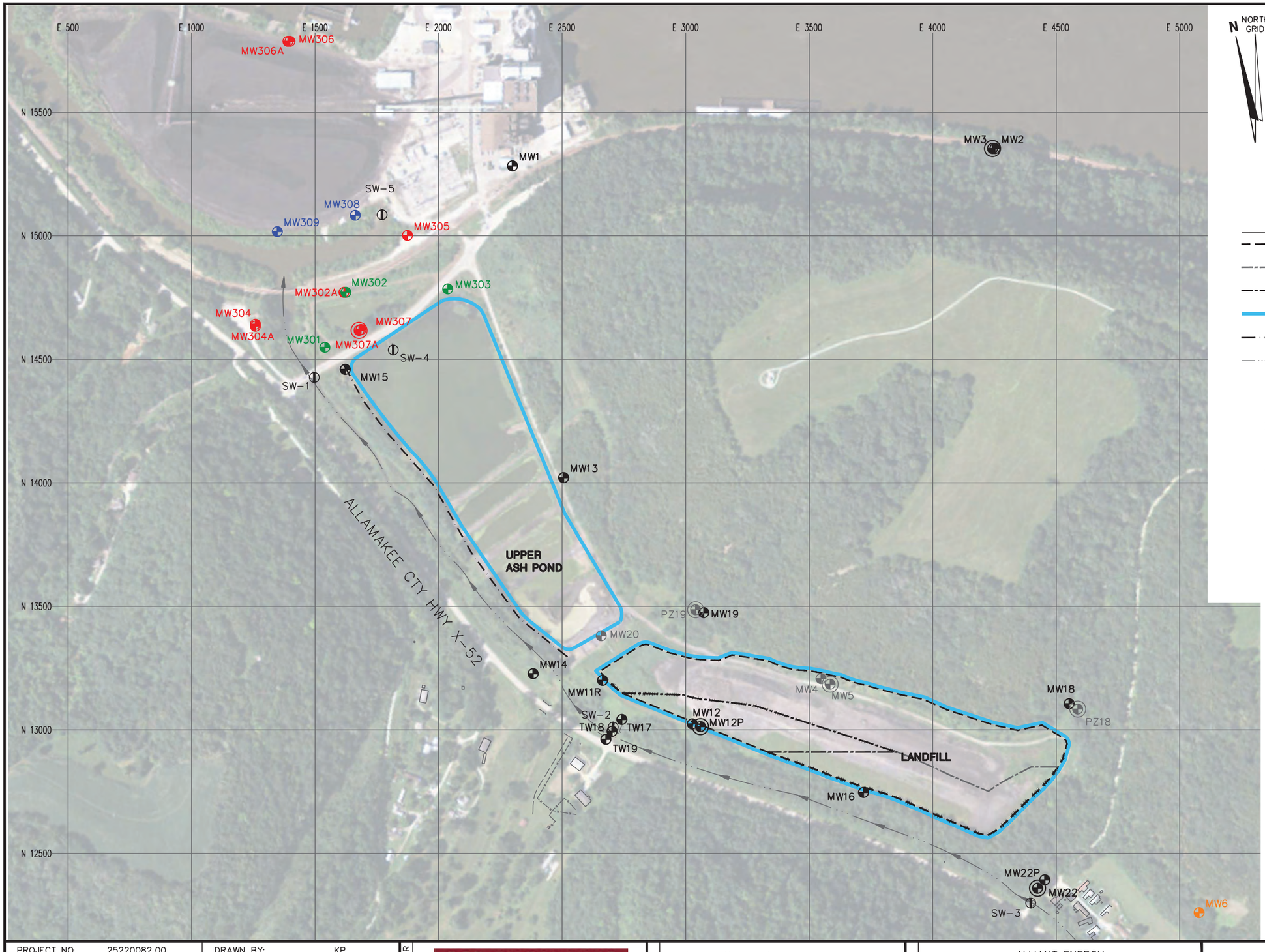
PROJECT NO.	25219070.00	DRAWN BY:	BSS
DRAWN:	11/27/2019	CHECKED BY:	MDB
REVISED:	11/27/2019	APPROVED BY:	TK 01/30/2020

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE
1

I:\25219070.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:31:40 PM



N NORTH GRID

LEGEND

	APPROVED LIMITS OF WASTE
	LIMITS OF PHASE 1 FINAL COVER
	LIMITS OF PHASE 2 FINAL COVER
	CCR LIMITS
	SLURRY WALL
	EXISTING STREAM
SW-1	EXISTING STAFF GAUGE
MW17	EXISTING MONITORING WELL
MW12P	EXISTING PIEZOMETER
MW4	ABANDONED MONITORING WELL
MW5	ABANDONED PIEZOMETER
MW306	CCR DELINEATION MONITORING WELL
MW301	CCR COMPLIANCE MONITORING WELL
MW6	CCR BACKGROUND MONITORING WELL
MW308	WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)

NOTES:

1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
2. MONITORING WELL MW20 WAS ABANDONED ON MAY 5, 2022..

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	05/26/2021	CHECKED BY:	JR
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT

INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

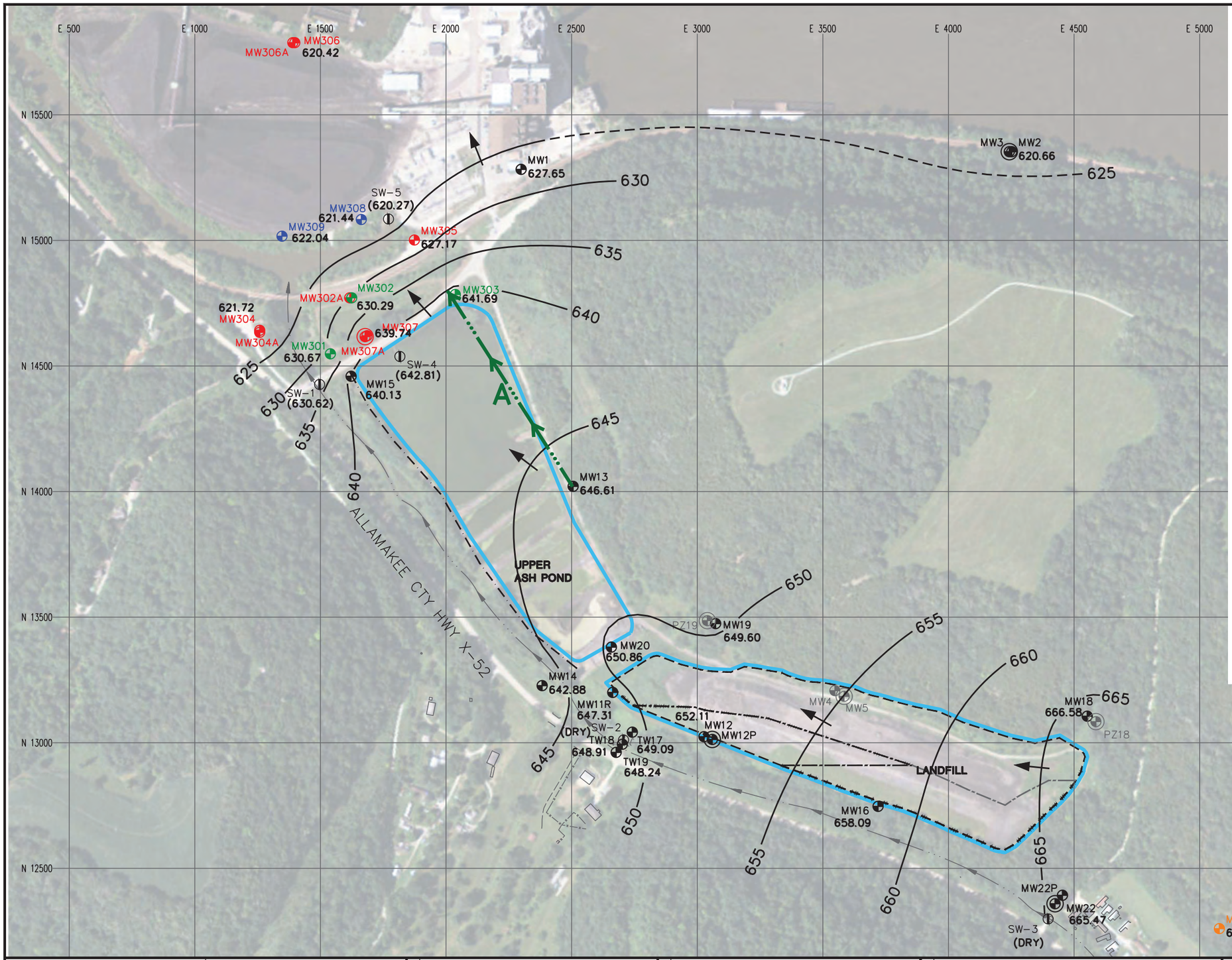
SITE

ALLIANT ENERGY
LANSING POWER STATION
LANSING, IOWA

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25220082.00\Drawings\SitePlan_CCR.dwg, 5/31/2023 8:32:24 AM



N NORTH GRID

LEGEND

	APPROVED LIMITS OF WASTE
	LIMITS OF PHASE 1 FINAL COVER
	LIMITS OF PHASE 2 FINAL COVER
	SLURRY WALL
	EXISTING STREAM
SW-1	EXISTING STAFF GAUGE
MW17	EXISTING MONITORING WELL
MW12P	EXISTING PIEZOMETER
MW4	ABANDONED MONITORING WELL
MW5	ABANDONED PIEZOMETER
MW306	CCR DELINEATION MONITORING WELL
MW301	CCR COMPLIANCE MONITORING WELL
MW6	CCR BACKGROUND MONITORING WELL
MW308	WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
	CCR UNITS
(642.81)	SURFACE WATER ELEVATION
(NM)	NOT MEASURED
666.58	WATER TABLE ELEVATION
	WATER TABLE CONTOUR (DASHED WHERE INFERRED)
	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
2. SEE FIGURE 2 FOR ADDITIONAL LEGEND ITEMS AND NOTES.

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	07/29/2022	CHECKED BY:	RM
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

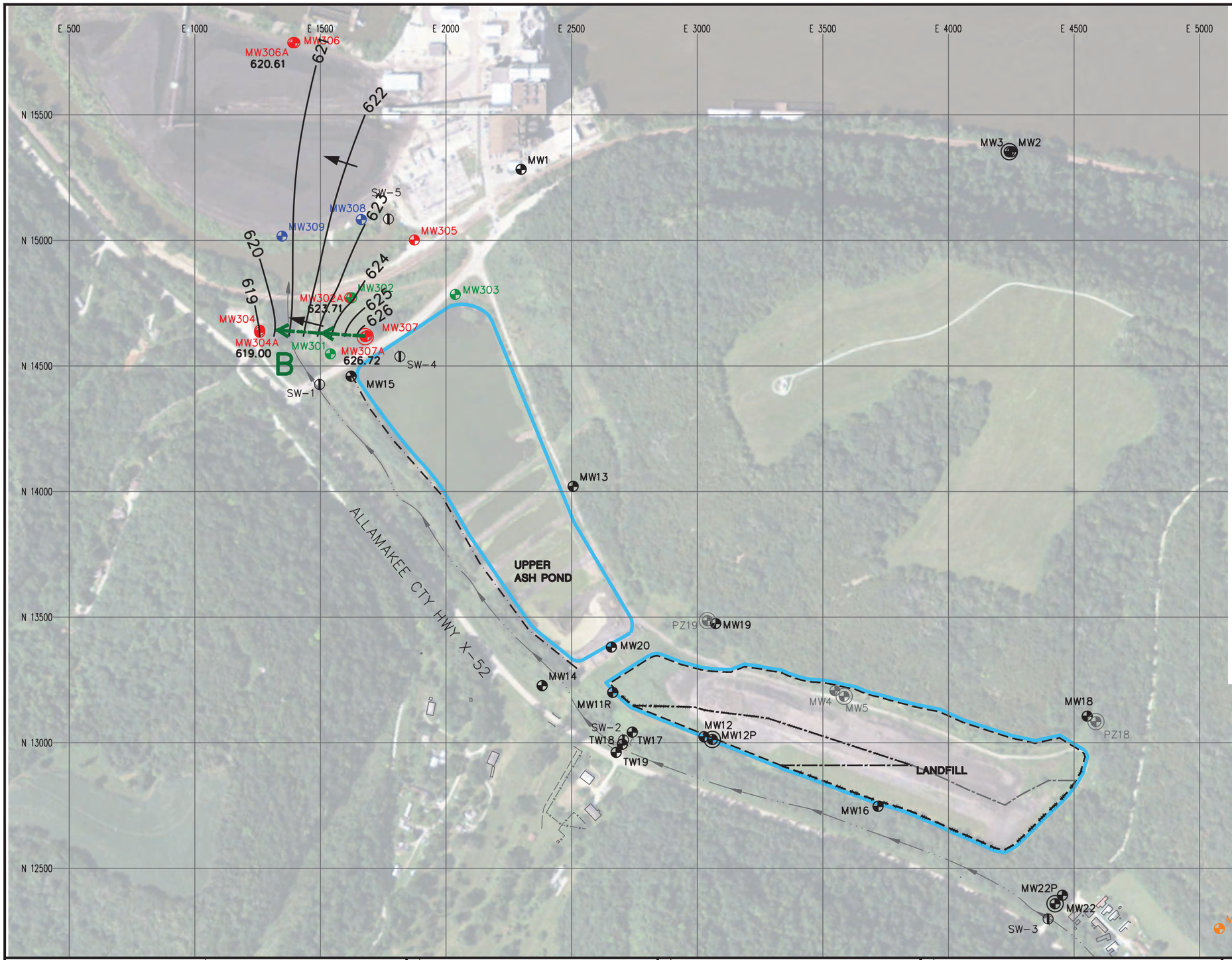
CLIENT: INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: ALLIANT ENERGY
LANSING POWER STATION
LANSING, IOWA

WATER TABLE MAP
APRIL 4-7, 2022

FIGURE 3

I:\25220082.00\Drawings\April 2022 Wtbl.dwg, 5/31/2023 8:35:55 AM



N NORTH GRID

LEGEND

- APPROVED LIMITS OF WASTE
- LIMITS OF PHASE 1 FINAL COVER
- LIMITS OF PHASE 2 FINAL COVER
- SLURRY WALL
- EXISTING STREAM
- SW-1 EXISTING STAFF GAUGE
- MW17 EXISTING MONITORING WELL
- MW12P EXISTING PIEZOMETER
- MW4 ABANDONED MONITORING WELL
- MW5 ABANDONED PIEZOMETER
- MW306 CCR DELINEATION MONITORING WELL
- MW301 CCR COMPLIANCE MONITORING WELL
- MW6 CCR BACKGROUND MONITORING WELL
- MW308 WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- CCR UNITS
- 626.72 POTENTIOMETRIC SURFACE ELEVATION
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
2. SEE FIGURE 2 FOR ADDITIONAL LEGEND ITEMS AND NOTES.
3. THE BACKGROUND MONITORING WELL FOR THE LANSING POWER STATION IS MW6.

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	07/29/2022	CHECKED BY:	RM
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

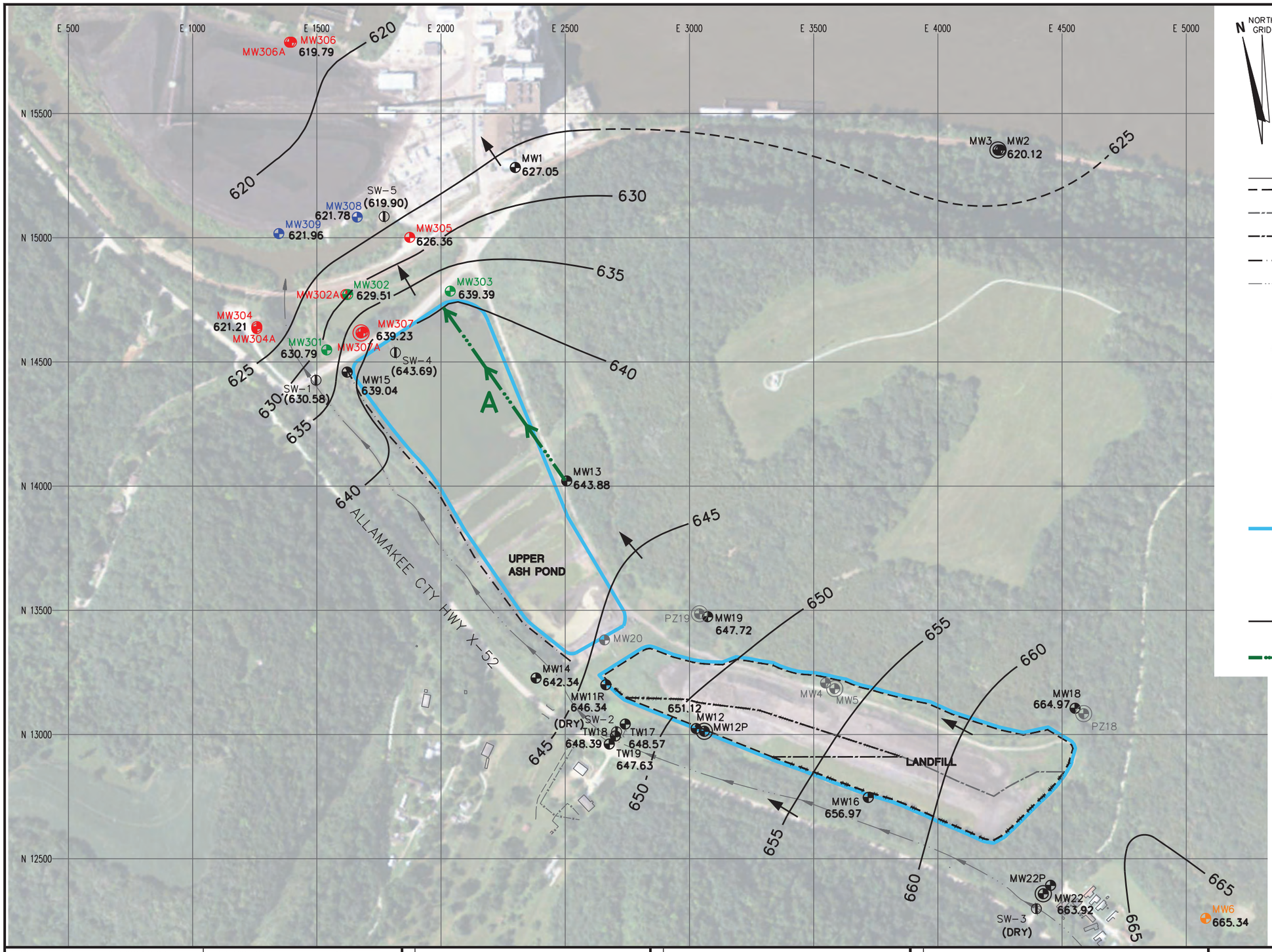
CLIENT: INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: ALLIANT ENERGY
LANSING POWER STATION
LANSING, IOWA

POTENTIOMETRIC SURFACE MAP
APRIL 4-7, 2022

FIGURE 4

I:\25220082.00\Drawings\April 2022 Wtbl.dwg, 5/31/2023 8:35:16 AM



N NORTH GRID

LEGEND

	APPROVED LIMITS OF WASTE
	LIMITS OF PHASE 1 FINAL COVER
	LIMITS OF PHASE 2 FINAL COVER
	SLURRY WALL
	EXISTING STREAM
SW-1	EXISTING STAFF GAUGE
MW17	EXISTING MONITORING WELL
MW12P	EXISTING PIEZOMETER
MW4	ABANDONED MONITORING WELL
MW5	ABANDONED PIEZOMETER
MW306	CCR DELINEATION MONITORING WELL
MW301	CCR COMPLIANCE MONITORING WELL
MW6	CCR BACKGROUND MONITORING WELL
MW308	WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
	CCR UNITS
(642.81)	SURFACE WATER ELEVATION
(NM)	NOT MEASURED
666.58	WATER TABLE ELEVATION
	WATER TABLE CONTOUR (DASHED WHERE INFERRED)
	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
2. SEE FIGURE 2 FOR ADDITIONAL LEGEND ITEMS AND NOTES.

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	10/26/2022	CHECKED BY:	RM
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: ALLIANT ENERGY
LANSING POWER STATION
LANSING, IOWA

WATER TABLE MAP
OCTOBER 17-19, 2022

FIGURE 5

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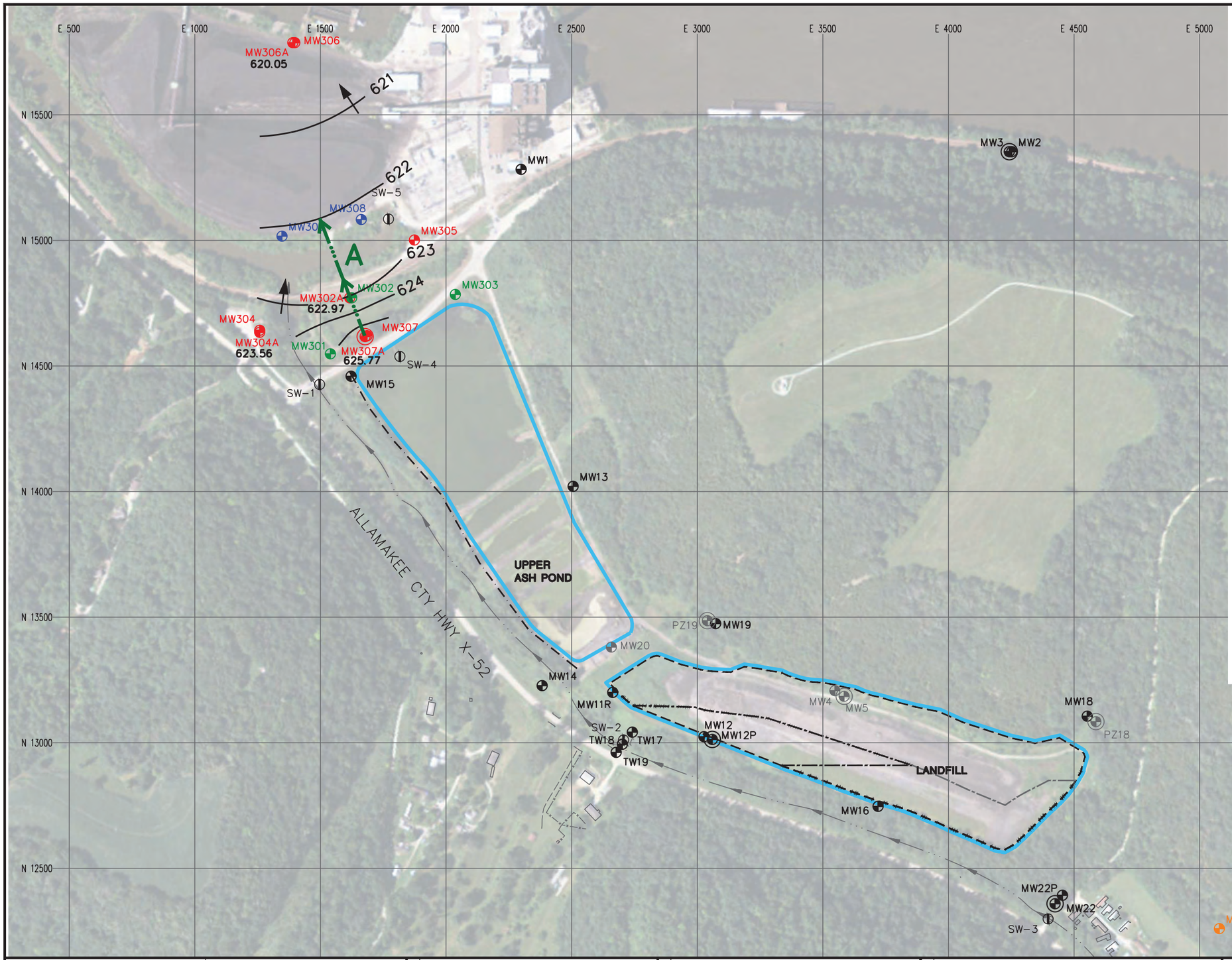

N NORTH GRID

LEGEND

	APPROVED LIMITS OF WASTE
	LIMITS OF PHASE 1 FINAL COVER
	LIMITS OF PHASE 2 FINAL COVER
	SLURRY WALL
	EXISTING STREAM
SW-1	EXISTING STAFF GAUGE
MW17	EXISTING MONITORING WELL
MW12P	EXISTING PIEZOMETER
MW4	ABANDONED MONITORING WELL
MW5	ABANDONED PIEZOMETER
MW306	CCR DELINEATION MONITORING WELL
MW301	CCR COMPLIANCE MONITORING WELL
MW6	CCR BACKGROUND MONITORING WELL
MW308	WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
	CCR UNITS
626.72	POTENTIOMETRIC SURFACE ELEVATION
	POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
2. SEE FIGURE 2 FOR ADDITIONAL LEGEND ITEMS AND NOTES.
3. THE BACKGROUND MONITORING WELL FOR THE LANSING POWER STATION IS MW6.

400 0 400

SCALE: 1" = 400'

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	10/26/2022	CHECKED BY:	RM
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: ALLIANT ENERGY
LANSING POWER STATION
LANSING, IOWA

POTENTIOMETRIC SURFACE MAP
OCTOBER 17-19, 2022

FIGURE 6

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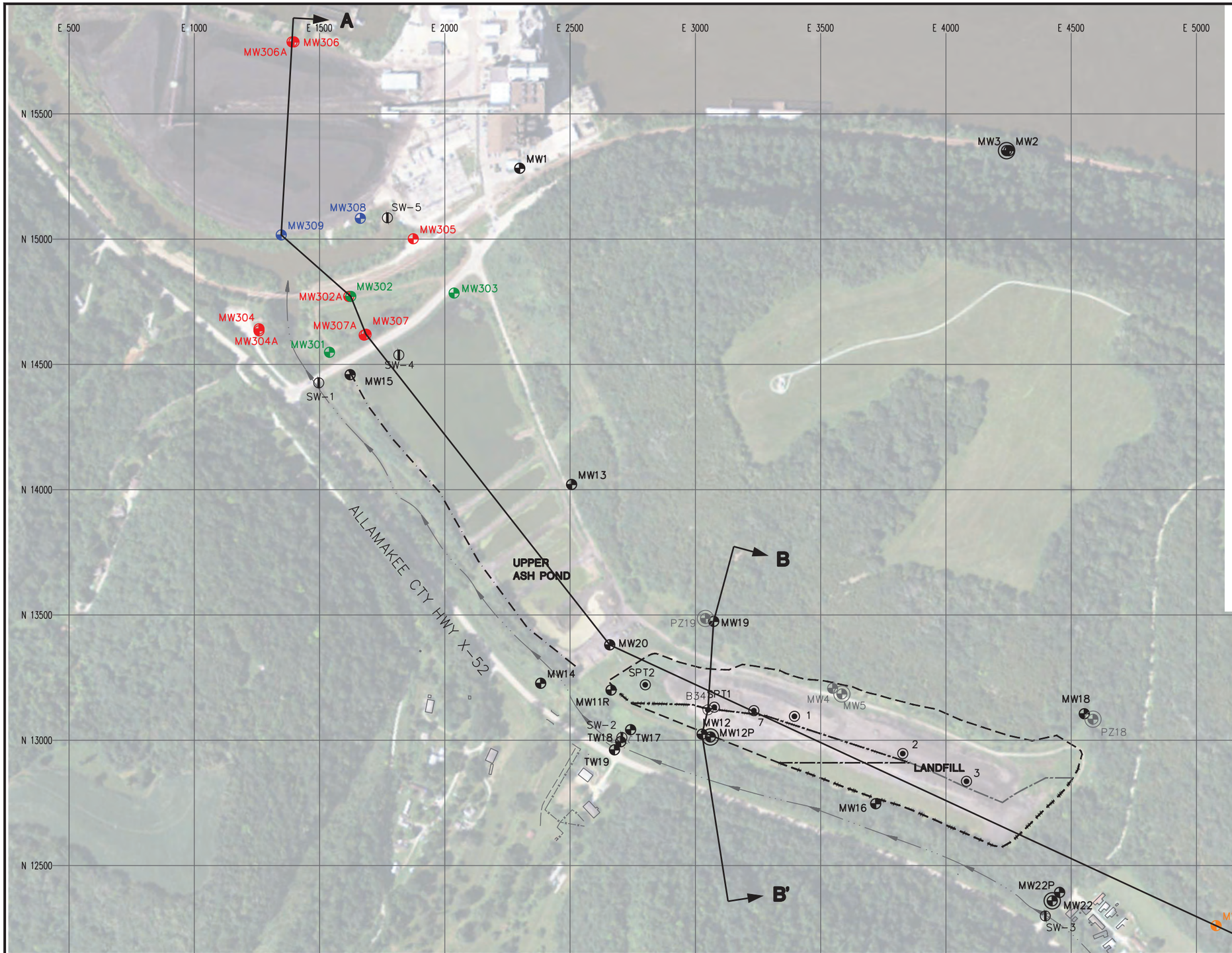


N NORTH GRID

400 0 400

SCALE: 1" = 400'

LEGEND

	APPROVED LIMITS OF WASTE
	LIMITS OF PHASE 1 FINAL COVER
	LIMITS OF PHASE 2 FINAL COVER
	SLURRY WALL
	EXISTING STREAM
SW-1	EXISTING STAFF GAUGE
MW17	EXISTING MONITORING WELL
MW12P	EXISTING PIEZOMETER
MW4	ABANDONED MONITORING WELL
MW5	ABANDONED PIEZOMETER
MW306	CCR DELINEATION MONITORING WELL
MW301	CCR COMPLIANCE MONITORING WELL
MW6	CCR BACKGROUND MONITORING WELL
MW308	WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
	SOIL BORING
	CROSS SECTION LOCATION

NOTES:

1. 2011 AERIAL PHOTOGRAPH FROM THE USDA-FSA AERIAL PHOTOGRAPHY FIELD OFFICE.
2. MONITORING WELL LOCATIONS AND CCR UNIT LIMITS ARE APPROXIMATE.
3. MONITORING WELLS MW20, MW301, MW302, AND MW303 WERE INSTALLED BY CASCADE DRILLING IN NOVEMBER 2015.
4. MONITORING WELLS MW304, MW305, AND MW306 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING IN MAY 2019.
5. MONITORING WELLS MW302A, MW304A, AND MW306A WERE INSTALLED BY CASCADE DRILLING IN DECEMBER 2019.
6. MONITORING WELLS MW307, MW307A, MW308, AND MW309 WERE INSTALLED BY CASCADE DRILLING IN JUNE 2021.
7. ONLY BORINGS USED FOR GEOLOGIC CROSS SECTION A-A' ARE SHOWN.
8. MW6 IS SAMPLED UNDER BOTH THE STATE AND CCR RULE MONITORING PROGRAMS.
9. THE BACKGROUND MONITORING WELL FOR THE LANSING POWER STATION IS MW6.

PROJECT NO.	25220082.00	DRAWN BY:	BSS/KP
DRAWN:	11/27/2019	CHECKED BY:	TK
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: ALLIANT ENERGY
LANSING GENERATING STATION
LANSING, IOWA

CROSS SECTION LOCATION MAP

FIGURE 7

I:\25220082.00\Drawings\Site Plan and Monitoring Well Locations.dwg, 5/31/2023 8:43:01 AM

COAL PILE

FORMER LOWER ASH POND

UPPER ASH POND

PERMITTED LANDFILL

ELEVATION

740 730 720 710 700 690 680 670 660 650 640 630 610 600 590 580

MW306/306A

MW309

MW307/307A

MW302/302A

MW20

MW6

B-34

SPT2

SPT1

7

1

2

3

(620.42)

(620.61)

(622.04)

(630.29)

(639.74)

(626.72)

(623.71)

(650.86)

(667.14)

ESTIMATED BOTTOM OF CCR FROM BORING LOGS

ESTIMATED BEDROCK SURFACE FROM BORING LOGS

ESTIMATED NATIVE SOIL SURFACE FROM BORING LOGS

POND WATER ELEVATION = 647.8±

SURFACE CREATED FROM FEATURE LINE TRACED FROM SARGENT & LUNDY POND ASBUILT WITH BASE ELEVATION = 624.00

NOTES:

1. THE EXISTING GROUND SURFACE TOPOGRAPHY IS A COMPOSITE OF COUNTY-WIDE LIDAR DERIVED CONTOUR DATA FROM 2008 AND TOPOGRAPHIC DATA COLLECTED DURING SITE SPECIFIC FIELD SURVEYS DATED IN AND AROUND 2015.

2. THE FOLLOWING MONITORING WELL AND BORING LOCATIONS ARE PROJECTED ALONG THE CROSS SECTION; B-34, 1, 2, 3, 7, SPT1, AND SPT2. SEE FIGURE 7 FOR CROSS SECTION LOCATION.

0 400

HORIZONTAL SCALE: 1" = 400'
VERTICAL SCALE: 1" = 20'
VERTICAL EXAGGERATION = 20X

PROTECTIVE CASING

ANNULAR SPACE SEAL

WELL SCREEN

FILTER PACK

WELL DETAIL

LEGEND

- FILL
- SAND, POORLY GRADED, LITTLE OR NO FINES (SP)
- SILT (ML)
- LEAN CLAY (CL)
- GRAVEL, POORLY GRADED, LITTLE OR NO FINES (GP)
- SILTY CLAY (CL-ML)
- SILTY GRAVEL (GM)
- SILTY SAND (SM)
- SANDSTONE
- (628.46) APRIL 4-7, 2022 WATER TABLE ELEVATION
- (623.12) APRIL 4-7, 2022 POTENTIOMETRIC SURFACE ELEVATION
- UPPER ASH POND SURFACE WATER ELEVATION MEASURED ON SEPTEMBER 4, 2015

PROJECT NO.	25220082.00	DRAWN BY:	AHB/RJG
DRAWN:	07/03/2019	CHECKED BY:	TK/EJN
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS, 2830 DAIRY DRIVE MADISON, WI 53718-6751, PHONE: (608) 224-2830

CLIENT: ALLIANT ENERGY, INTERSTATE POWER AND LIGHT, 2320 POWER PLANT DRIVE, LANSING, IA 52151-9733

SITE: INTERSTATE POWER AND LIGHT, LANSING POWER STATION, COAL COMBUSTION RESIDUE LANDFILL, LANSING, IOWA

CROSS SECTION A-A'

FIGURE 8A

I:\25220082.00\Drawings\section (State Plane).dwg, 5/31/2023 9:08:42 AM

660
650
640
630
620
610
600
590
580

ELEVATION

COAL PILE

MW-309

(622.04)

UNNAMED STREAM

(620.27)

SAND, SILT, CLAY, AND GRAVEL

MW-302/302A

(630.29)

(623.71)

POWER PLANT DRIVE

BERM

INTERCEPTOR TRENCH AND COLLECTION PIPE

NON-CCR FILL (FORMER LOWER ASH POND)

MW307/307A

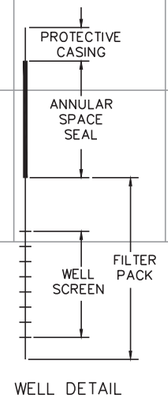
(639.74)

(626.72)

UPPER ASH POND

LEGEND

- SAND, WELL GRADED, LITTLE OR NO FINES (SW)
- SAND, POORLY GRADED, LITTLE OR NO FINES (SP)
- SILT (ML)
- LEAN CLAY (CL)
- GRAVEL, POORLY GRADED, LITTLE OR NO FINES (GP)
- SILTY SAND (SM)
- SILTY GRAVEL (GM)
- (628.46) APRIL 4-7, 2022 WATER TABLE ELEVATION
- (623.12) APRIL 4-7, 2022 POTENTIOMETRIC SURFACE ELEVATION



WELL DETAIL

0 50

HORIZONTAL SCALE: 1" =50'
VERTICAL SCALE: 1" = 10'
VERTICAL EXAGGERATION = 5X

NOTES:

1. THE EXISTING GROUND SURFACE TOPOGRAPHY IS A COMPOSITE OF COUNTY-WIDE LIDAR DERIVED CONTOUR DATA FROM 2008 AND TOPOGRAPHIC DATA COLLECTED DURING SITE SPECIFIC FIELD SURVEYS DATED IN AND AROUND 2015.

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	12/13/2021	CHECKED BY:	TK/EJN
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: ALLIANT ENERGY
INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE: INTERSTATE POWER AND LIGHT
LANSING POWER STATION
COAL COMBUSTION RESIDUE LANDFILL
LANSING, IOWA

CROSS SECTION A-A'
(ZOOMED INTO MW-302 AREA)

FIGURE
8B

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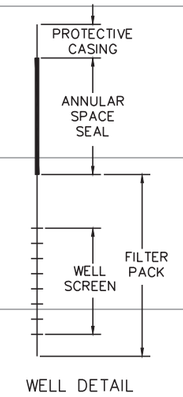
LEGEND

- FILL
- SAND, POORLY GRADED, LITTLE OR NO FINES (SP)
- SILT (ML)
- LEAN CLAY (CL)
- SILTY SAND (SM)
- SILTY GRAVEL (GM)
- SANDSTONE
- (628.46) APRIL 4–7, 2022 WATER TABLE ELEVATION
- (623.12) APRIL 4–7, 2022 POTENTIOMETRIC SURFACE ELEVATION



WELL DETAIL

NOTES:

1. HE EXISTING GROUND SURFACE TOPOGRAPHY IS A COMPOSITE OF COUNTY–WIDE LIDAR DERIVED CONTOUR DATA FROM 2008 AND TOPOGRAPHIC DATA COLLECTED DURING SITE SPECIFIC FIELD SURVEYS DATED IN AND AROUND 2015.
2. BORING B–34 WAS DRILLED ON MAY 22–28, 2015. THE BORING WAS LEFT OPEN OVERNIGHT TO A DEPTH OF 55 FEET, AND NO LEACHATE OR GROUNDWATER ENTERED THE BORING.

PROJECT NO.	25220082.00	DRAWN BY:	KP
DRAWN:	03/21/2023	CHECKED BY:	TK/EJN
REVISED:	05/31/2023	APPROVED BY:	TK 5/30/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718–6751
PHONE: (608) 224–2830

CLIENT: ALLIANT ENERGY
INTERSTATE POWER AND LIGHT
2320 POWER PLANT DRIVE
LANSING, IA 52151–9733

SITE: INTERSTATE POWER AND LIGHT
LANSING POWER STATION
COAL COMBUSTION RESIDUE LANDFILL
LANSING, IOWA

CROSS SECTION B–B'

FIGURE 9

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Appendix A

Regional Geological and Hydrogeological Information

Table LAN-3 Regional Hydrogeologic Stratigraphy
Lansing Generating Station / SCS Engineers Project #25215053

Strategic Unit			Hydrogeologic Units	Type of Rock	Hydrologic Conditions	Thickness Range (ft)	Age of Rocks*
Quaternary		Recent and Pleistocene deposits	Surficial aquifers-Alluvium, Drift, Buried-channel	Sand and gravel interbedded with silt and clay	Mostly unconfined local aquifers, some artesian, small-to-large yields	0 – 305	0 – 2.8 million years (m.y.)
Devonian	Yellow Spring Group (Gp)	Lime Creek Formation (Fm)	Confining layers	Shale, some dolostone	Non-aquifer	0 – 50	365 – 405 m.y.
	Cedar Valley Gp	Lithograph City Fm Coralville Fm Little Cedar Fm	Silurian-Devonian aquifer	Limestone and dolostone, thin shales	Major aquifer, mostly artesian, moderate-to-large yields	0 – 400	
	Wapsipinicon Gp	Pinicon Ridge Fm Spillville Fm		Dolostone and limestone			
Silurian		Scotch Grove Fm Hopkinton Fm Blanding Fm Tete des Morts Fm		Dolostone, locally with much chert, local shale as cavern fillings			405 – 425 m.y.
Ordovician	Maquoketa Fm	Brainard Member Fort Atkinson Member Clermont Member Elgin Member	Maquoketa Fm, confining beds	Shale and dolostone, some chert	Non-aquifer to local aquifer, small-to-moderate yields	0 – 300	425 – 455 m.y.
			Fort Atkinson – Elgin aquifer				
	Galena Gp	Dubuque Fm Wise Lake Fm Dunleith Fm Decorah Fm	Galena aquifer	Limestone and dolostone, minor chert, shale at base and locally in upper part	Local aquifer, confined and unconfined, small-to-moderate yields	0 – 240	455 – 460 m.y.
		Platteville Fm Glenwood Fm	Decorah-Platteville-Glenwood confining beds	Limestone and shale	Non-aquifer	0 – 50	
		St. Peter Sandstone Prairie du Chien Gr	Cambrian-Ordovician aquifer	Sandstone	Major aquifer, mostly artesian, large yields	0 – 580	460 – 500 m.y.
				Dolostone, minor sandstone and chert			500 – 503 m.y.
Cambrian		Jordan Sandstone		Sandstone, dolomitic			
		St. Lawrence Fm Lone Rock (Franconia) Fm	Cambrian confining beds	Dolostone, silty	Non-aquifer	0 – 400	503 – 508 m.y.
				Fine, sandstone, siltstone, shale, and minor dolostone			
		Wenowoc (incl Ironton-Galesville sandstone) Fm Eau Claire Fm Mt. Simon Sandstone	Dresbach aquifer	Sandstone	Artesian aquifer, large yields	0 – 1,950	508 – 515 m.y.
				Fine sandstone, siltstone, and shale			
				Sandstone			
Pre-C		Undifferentiated crystalline rocks	Unknown	Igneous and metamorphic rocks	Unknown	Unknown	570 m.y. – > 2 billion years

*Age determinations as used on COSUNA charts published by AAPG-USGS

Source: "Water Resources of Southeast Iowa," Iowa Geologic Survey Water Atlas No. 4.

I:\25215053\Data\Tables\Table 2_Regional Hydrogeologic Stratigraphy.doc

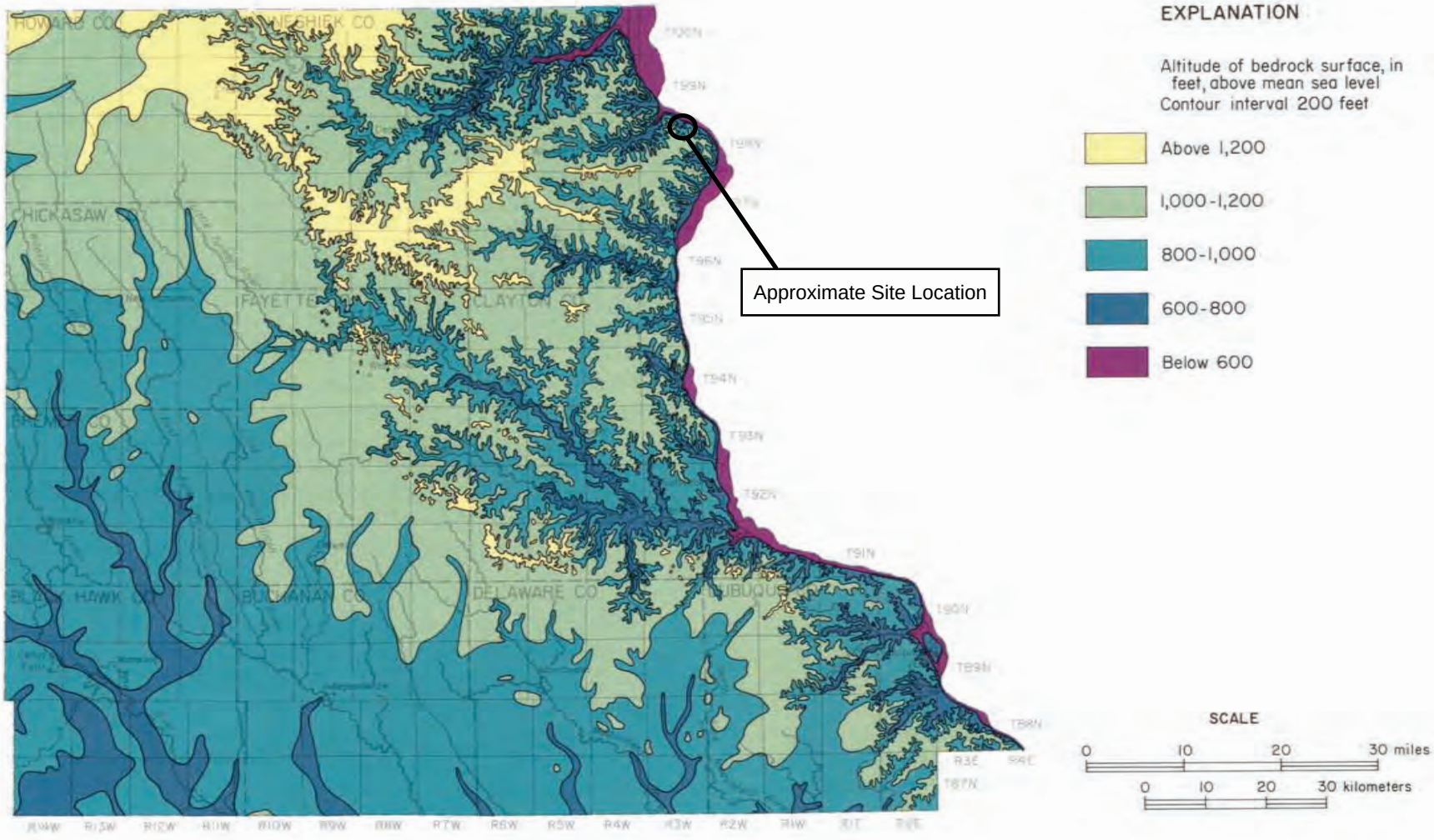


Figure 30. Altitude and configuration of the bedrock surface

Source: Horick, Paul J., Water Resources of Northeast Iowa, Iowa Department of Natural Resources Water Atlas Number 8, October

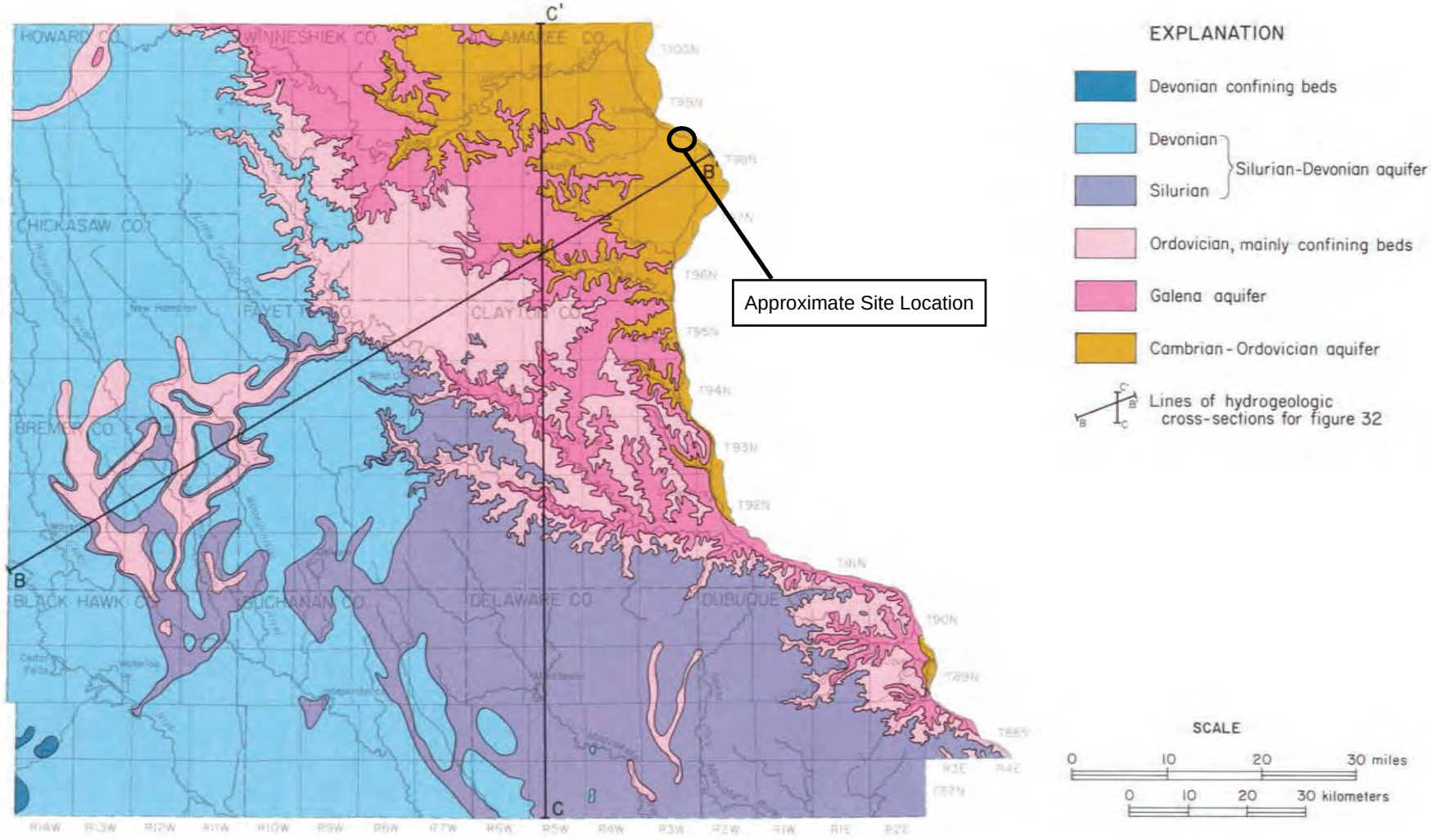


Figure 31. Bedrock hydrogeologic map

Source: Horick, Paul J., Water Resources of Northeast Iowa, Iowa Department of Natural Resources Water Atlas Number 8, October

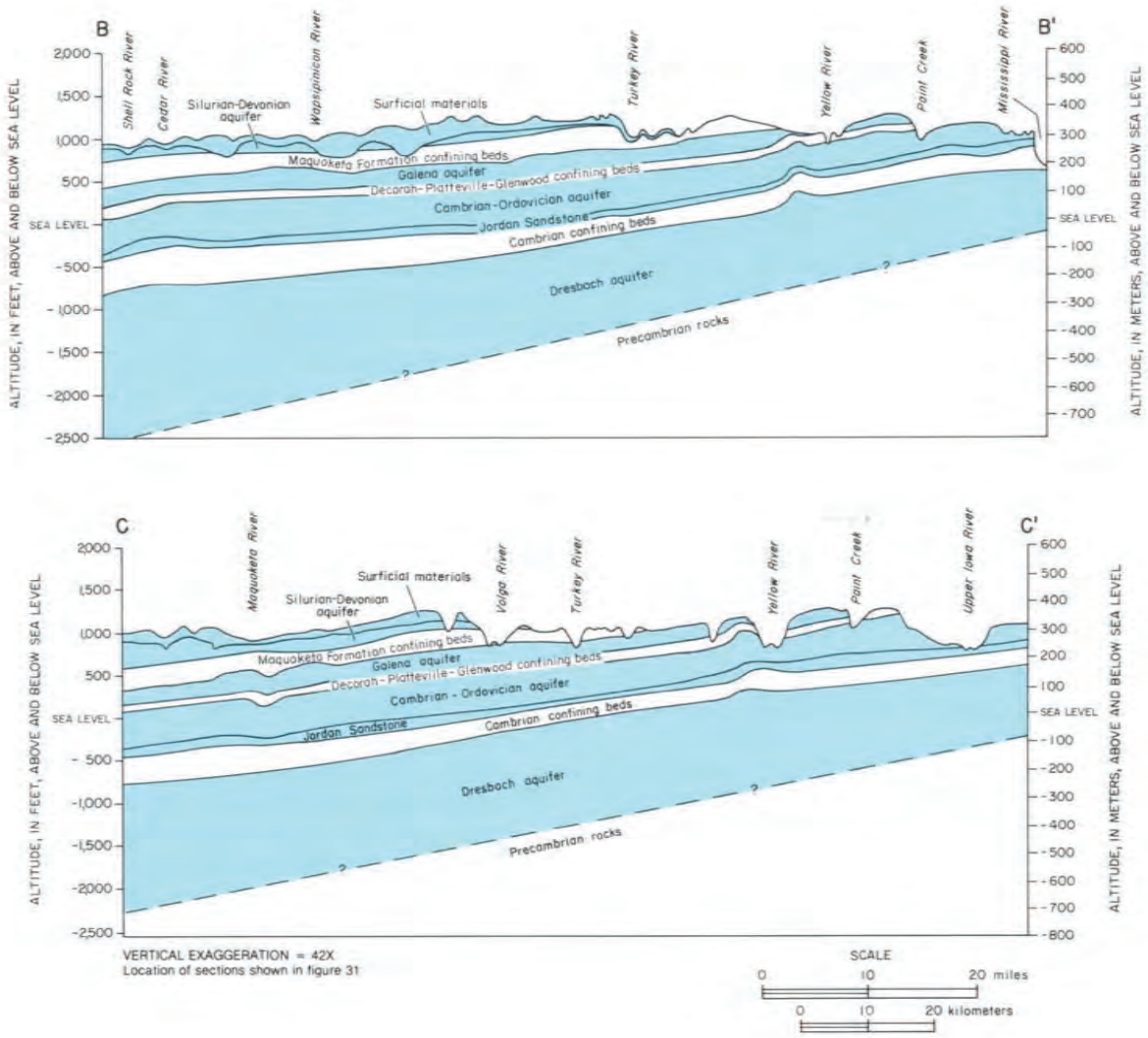


Figure 32. Hydrogeologic cross-sections

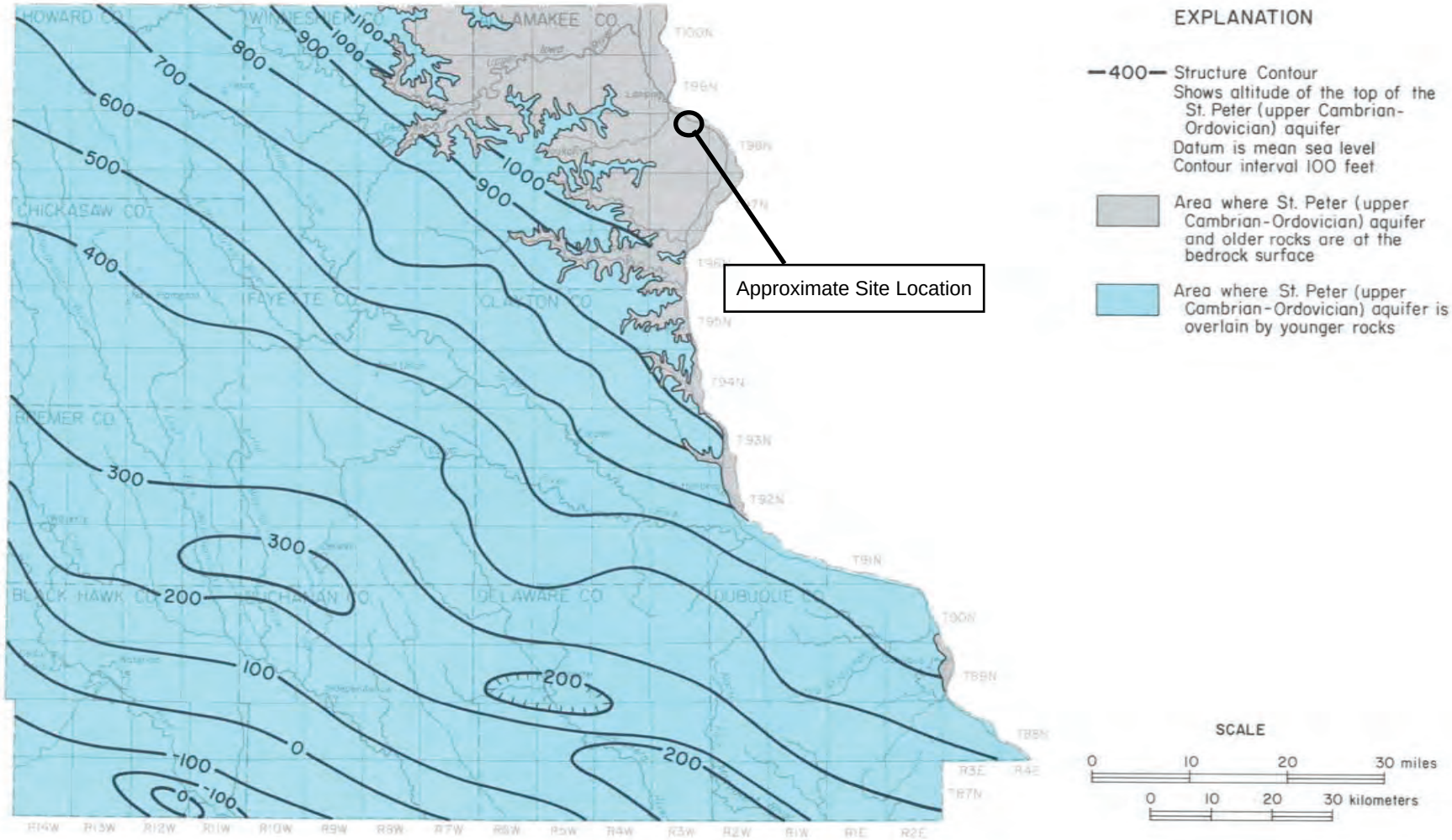


Figure 38. Altitude of the top of the St. Peter (upper Cambrian-Ordovician) aquifer

Source: Horick, Paul J., Water Resources of Northeast Iowa, Iowa Department of Natural Resources Water Atlas Number 8, October

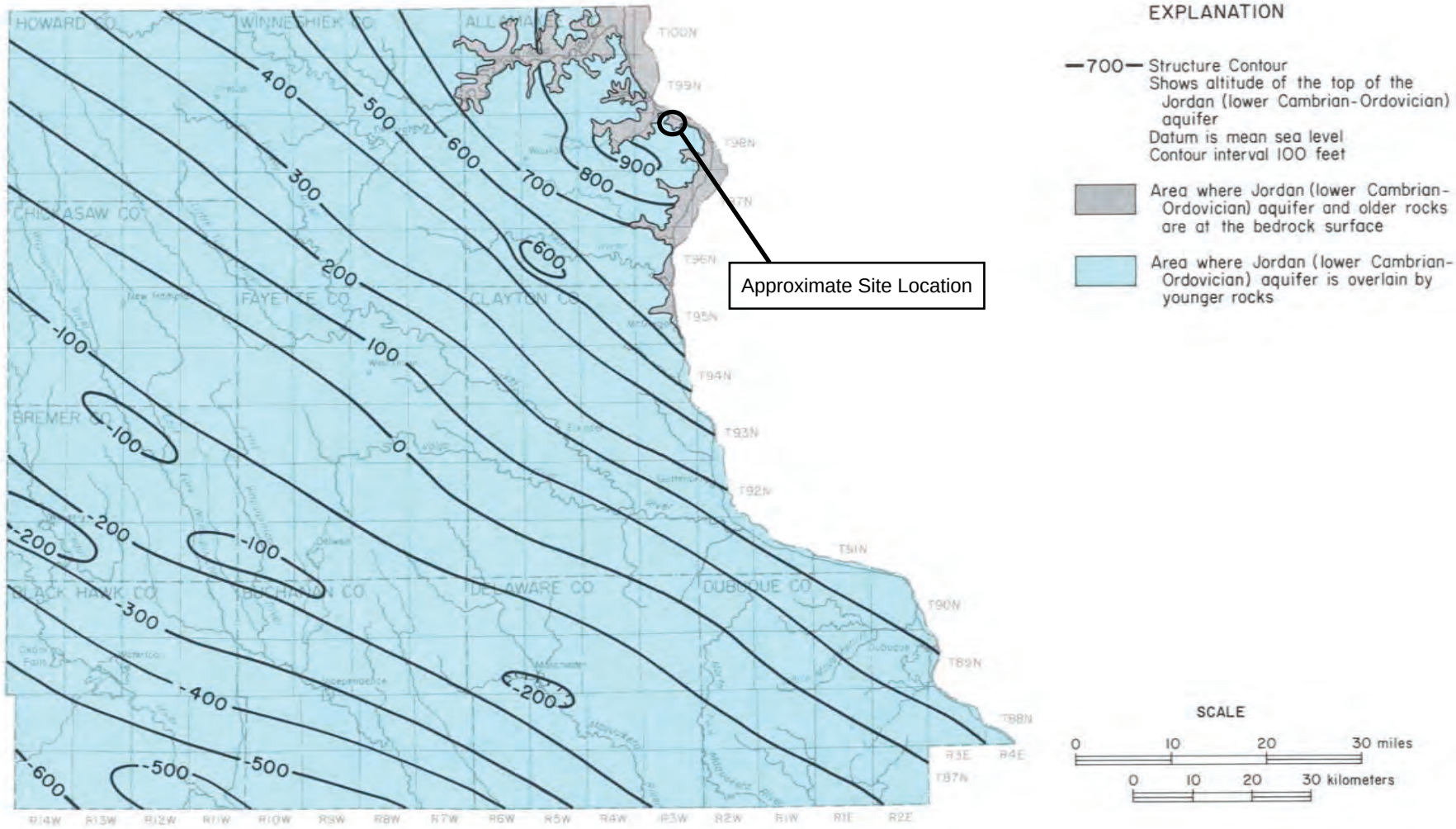


Figure 39. Altitude of the top of the Jordan (lower Cambrian-Ordovician) aquifer

Source: Horick, Paul J., Water Resources of Northeast Iowa, Iowa Department of Natural Resources Water Atlas Number 8, October

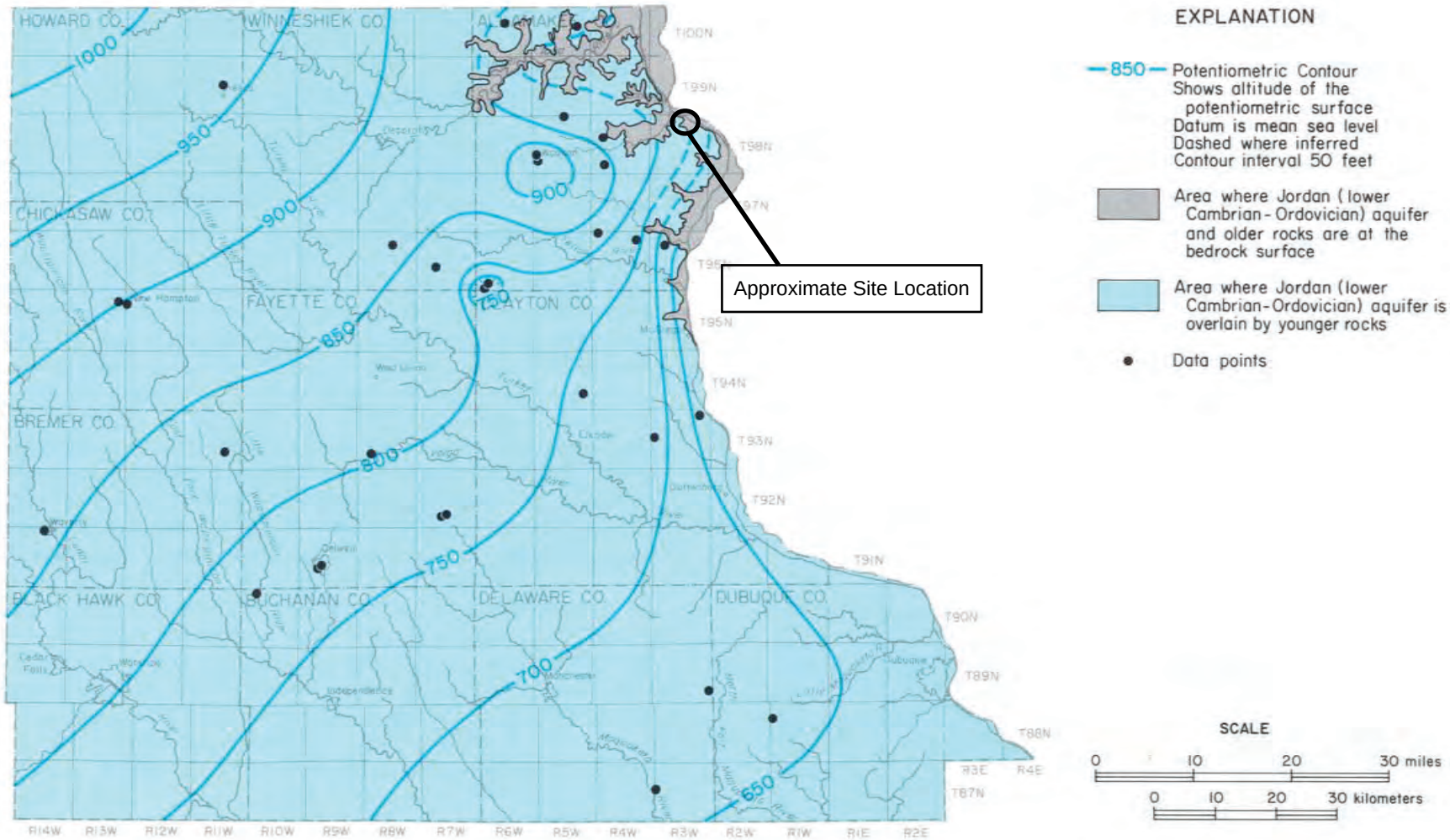


Figure 56. Potentiometric surface of the Jordan (lower Cambrian-Ordovician) aquifer

Source: Horick, Paul J., Water Resources of Northeast Iowa, Iowa Department of Natural Resources Water Atlas Number 8, October

Appendix B

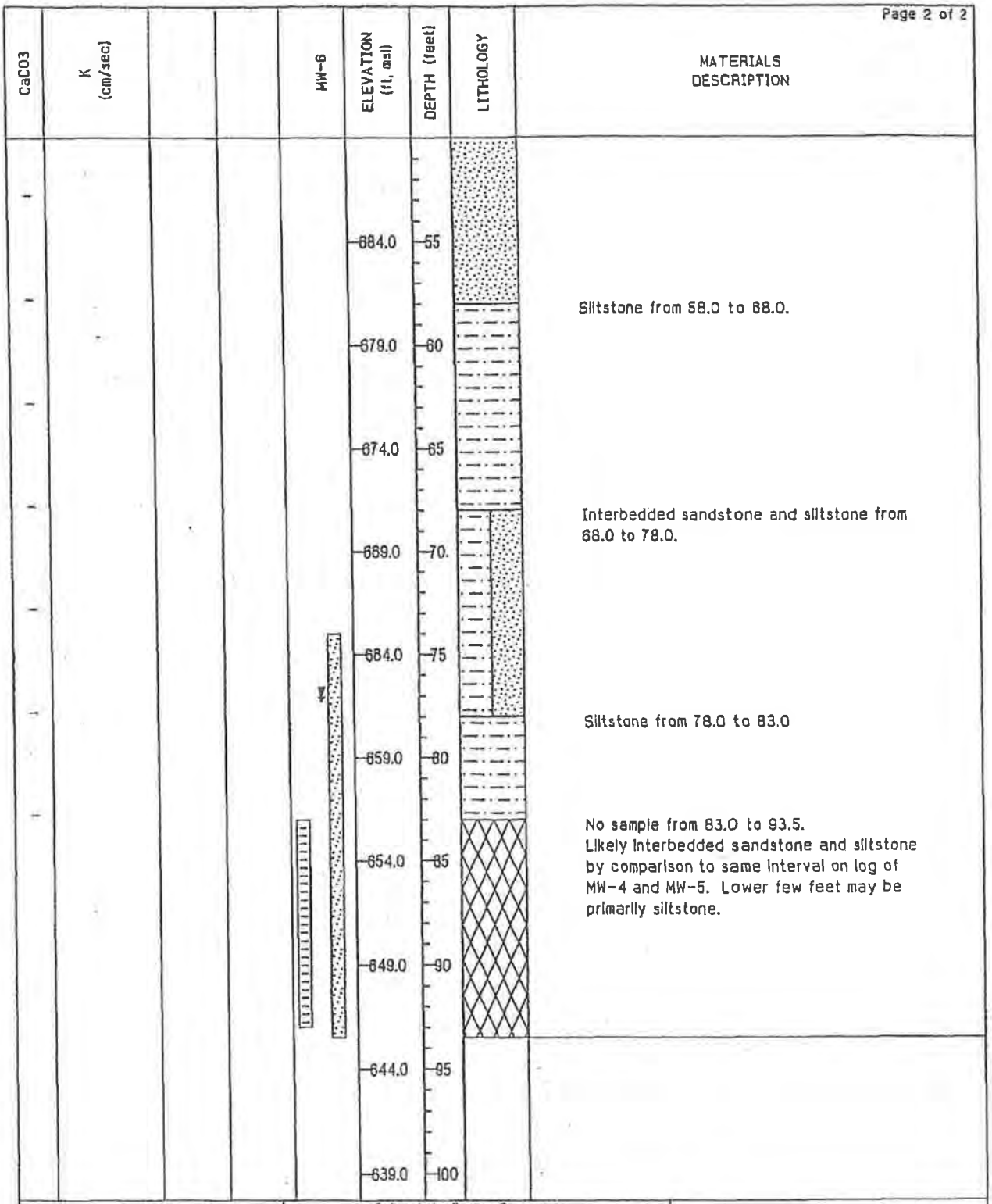
Boring Logs and Well Construction Forms

CaCO3	K (cm/sec)			MW-B	ELEVATION (ft, msl)	DEPTH (feet)	LITHOLOGY	MATERIALS DESCRIPTION
					734.0	5		0.0 to 6.0 SILT Topsoil developed in silt from 0.0 to 1.5. Topsoil is dark brown. Clayey silt, trace sand is loess or colluvium (slopewash) derived from loess. Medium brown, changing gradually to yellow brown below 5.0.
					729.0	10		6.0 to 37.0 TALUS Light brown sandy silt with dolomite chunks.
					724.0	15		
					719.0	20		
					714.0	25		
					709.0	30		
					704.0	35		
					699.0	40		37.0 to 93.5 INTERBEDDED SANDSTONE AND SILTSTONE Sandstone is fine-grained, with quartz silt matrix, glauconitic. Siltsone contains minor amount of very fine quartz sand and glauconite. Sandstone is laminated light greenish gray with creamy color. Siltstone is light greenish gray. Sandstone from 37.0 to 58.0.
					694.0	45		
					689.0	50		

Howard R. Green Company
CONSULTING ENGINEERS

PROJECT Interstate Power Company
PROJECT NUMBER 717680-J
SURFACE ELEVATION 739.3 Feet MSL
TOTAL DEPTH OF HOLE 93.5 Feet

LOG OF MW-6
LOCATION Lansing, Iowa
GEOLOGIST Barbara Torney



Howard R. Green Company
CONSULTING ENGINEERS

PROJECT Interstate Power Company
PROJECT NUMBER 717680-J
SURFACE ELEVATION 738.3 Feet MSL
TOTAL DEPTH OF HOLE 93.5 Feet

LOG OF MW-6
LOCATION Lansing, Iowa
GEOLOGIST Barbara Torney

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Lansing Generating Station SCS#: 25215135.70		B-301

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	11/2/2015	11/2/2015	hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-301	Feet	639.4 Feet	8.0 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,744 N, 5,541,108 E S/C/N
NW 1/4 of SW 1/4 of Section 2, T 98 N, R 3 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	POORLY GRADED SAND, medium grained, very dark gray brown (10YR 3/2).										
			2		SP									
S1	23	10 31 38 48	3							M				
			4											
			5	POORLY GRADED SAND WITH SILT, medium grained, dark yellowish brown (10YR 3/4)										
S2	24	32 47 50	6		SP-SM					M				
			7											
			8	POORLY GRADED SAND WITH SILT AND GRAVEL, medium grained sand, large grained gravel, dark yellowish brown (10YR 3/6).										
S3	22	18 33 47 43	9		SP-SM					M				
			10	POORLY GRADED SAND WITH SILT, medium grained, dark yellowish brown (10YR 3/6).										
S4	24	36 46 50	11							S				Water @ 10 ft bgs
			12		SP-SM									
S5	22	13 9 7 10	13							S				
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
Kyle Thun	SCS Engineers 2830 Dairy Drive Madison, WI 53718	608-224-2830 Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-301

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S6	20	3 2 4	16	SILT, black (10YR 3/1).	ML					S				
			17											
S7	24	2 2 2 2	18	SILT WITH SAND, black (10YR 3/1).	ML					S				
			19											
			20	POORLY GRADED SAND WITH SILT, black (10YR 3/1).										
S8	24	2 2 4	21		SP-SM					S				
			22											
S9	24	2 9 12 14	23	SILT, dark olive gray (5Y 3/2).						S				
			24		ML									
			25											
			26	End of Boring at 26 ft bgs.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Lansing Generating Station SCS#: 25215135.70		B-302

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	11/4/2015	11/4/2015	hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-302	Feet	635.9 Feet	8.0 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,929 N, 5,541,179 E S/C/N
NW 1/4 of SW 1/4 of Section 2, T 98 N, R 3 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	POORLY GRADED SAND, medium grained, dark grayish brown (10YR 4/2).										
S1	24	6 14 17 19	2 3 4		SP					M				
S2	24	26 45 50	5 6	SANDY SILT, trace small gravel, black (10YR 3/1).						M				
S3	24	12 13 10 8	7 8 9							M				
S4	11	9 11 13 12	10 11	Large gravel	ML					S				Saturation @ 11 ft bgs
S5	8	32 23 30 36	12 13 14	Large gravel						S				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-224-2830
	SCS Engineers 2830 Dairy Drive Madison, WI 53718	Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B-302 Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S6	24	5 5 6 8	16	SANDY SILT, trace small gravel, black (10YR 3/1). *(continued)*	ML					S				
			17											
S7	18		18	Silt, Black (10YR 3/1).	ML					S				
			19											
			20	End of Boring at 20 ft bgs.										

SCS ENGINEERS
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SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL - Lansing Generating Station SCS#: 25218221.00		MW-302A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	12/16/2019	12/17/2019	Rotosonic

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			13.01 Feet	636.2 Feet	6 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3957930.08 N, 5541186.04 E S / C / N
SW 1/4 of NW 1/4 of Section 02 , T 98 N, R 03 W
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovac to 9' to check for utilities.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
S1	46"		9	POORLY GRADED SAND with silt, clay and trace gravel, dark gray.	SP					W				
			10											
			11	SILT, gray, trace gravel.	ML									
			12											
			13	SILTY GRAVEL WITH SAND, gray, sand is fine to medium grained, gravel is subangular to angular.	GM									
			14											
S2	39"		15							W				
			16											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Firm SCS Engineers Tel: Fax:

Boring Number MW-302A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			17	SILTY GRAVEL WITH SAND, gray, sand is fine to medium grained, gravel is subangular to angular. *(continued)*	GM									
			18	SILT, dark gray, trace roots.										
			19											
			20		ML									
S3	48"		21							W				
			22	LEAN CLAY, dark gray, roots.										
			23											
			24											
			25		CL									
S4	40"		26	Same but dark brown.						W				
			27											
			28											
			29	SILTY SAND, gray to dark gray, fine to medium grained.										
			30		SM									
			31	LEAN CLAY, tan with yellow to brown mottling and gray layers, trace silt.										
S5	48"		32		CL					W				
			33	LEAN CLAY, reddish brown, massive, very dense.										
			34											
			35		CL									
			36	LEAN CLAY, gray.										
S6	48"		37							W				
			38		CL									
			39	POORLY GRADED SAND, brown, fine to medium grain, trace gravel.										
			40											
			41		SP									
S7	48"		42	Same with trace shells						W				

Boring Number MW-302A

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			43	POORLY GRADED SAND, brown, fine to medium grained, trace gravel. *(continued)*	SP									
			44	SILTY GRAVEL, light brown, subangular.	GM									
			45											
			46	LEAN CLAY, mostly light brown, trace gray, trace silt.										
S8	48"		47		CL					W				
			48											
			49	SILTY GRAVEL WITH SAND, light brown, gravel is subangular.	GM									
			50	End of boring at 50 feet.										

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SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Lansing Generating Station SCS#: 25215135.70		B-303

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	11/2/2015	11/2/2015	hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-303	Feet	653.9 Feet	8.0 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,857 N, 5,541,622 E S/C/N
NW 1/4 of SW 1/4 of Section 2, T 98 N, R 3 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	SILTY SAND, very dark gray (5Y 3/1)	SM									
			2											
S1	24	5 16 17 24	3	POORLY GRADED SAND, medium grained, dark grayish brown (10 YR 4/2).						M				
			4											
S2	24	11 8 10	5		SP					M				
			6											
			7	POORLY GRADED SAND , medium grained, grayish brown (2.5Y 5/2)										
S3	24	11 38 50	8							M				
			9											
S4	18	16 35 50	10		SP					M				
			11											
			12											
S5	16	27 50 50	13							M				
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-224-2830
	SCS Engineers 2830 Dairy Drive Madison, WI 53718	Fax:

Boring Number B-303 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S6	0	38 50	16	POORLY GRADED SAND , medium grained, grayish brown (2.5Y 5/2). *(continued)*						M				Rock in Spoon
			17		SP									
S7	18	17 25 40 47	18							S				Saturation @17 ft bgs.
			19											
			20	POORLY GRADED SAND, medium grained, very dark gray (5Y 3/1).										
S8	17	37 48 44	21							S				
			22											
S9	18	11 24 26 27	23		SP					S				
			24											
			25											
S10	24	37 50	26							S				
			27	End of Boring at 27 ft bgs.										

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SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL Lansing Generating Station SCS#: 25218221.00		MW304

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Eric Wetzel Roberts Environmental Drilling, Inc.	5/15/2019	5/15/2019	4.25" HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW304	623.61 Feet MSL	635.5 Feet MSL	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,893 N, 5,540,876 E S/C/N
SE 1/4 of NE 1/4 of Section 3, T 98 N, R 3 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	12	3 6 3 3	1–2	SILT, mottled, (10YR 3/2), some black coal looking material.	ML					M				
	18	1 2 2 1	3–4	LEAN CLAY, (10YR 4/3), soft, some organic material.	CL					W				
	12	2 2 3 2	5–6	SILT, (10YR 2/2), uniform, trace fine sand and clay.	ML					M				
	18	1 1 3 2	7–8							W				
	18	1 2 1 1	9–10	POORLY GRADED SAND, fine to coarse, (10YR 3/4), (Alluvial).						W				
	12	0 0 1 1	11–12		SP					W				
	12	0 0 1 1	13–14							W				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
for Zach Watson	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

Boring Number MW304 Page 2 of 2

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
		0 0 1 1	16	POORLY GRADED SAND, fine to coarse, (10YR 3/4), (Alluvial). *(continued)*						W				
			17	Same as above but more coarse, (2.5YR 5/4), trace silt.	SP									
		2 5 6 6	18							W				
			19											
			20	End of Boring at 20 feet.										

SCS ENGINEERS
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SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL - Lansing Generating Station SCS#: 25218221.00		MW-304A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	12/18/2019	12/19/2019	Rotosonic

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			10.7 Feet	635.6 Feet	6 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3957884.99 N, 5540876.5 E S / C / N
SE 1/4 of NE 1/4 of Section 03 , T 98 N, R 03 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovac to 9' to check for utilities.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	SILT, grayish brown, toots and sticks.	ML									
			11	POORLY GRADED SAND WITH SILT AND GRAVEL, fine to medium grained, reddish brown.										
S1	49"		12		SP-SM					W				
			13											
			14	POORLY GRADED SAND, reddish brown, fine to medium grained.										
			15		SP									
			16											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Firm SCS Engineers Tel: Fax:

Boring Number MW-304A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			17	POORLY GRADED SAND, reddish brown, fine to medium grained. *(continued)*										
S2	21"		18							W				
			19		SP									
			20	Same but light brown, mostly fine grained.										
			21											
			22											
S3	59"		23							W				
				SANDY SILT, brown, fine grained.										
			24											
			25											
			26		ML									
			27											
S4	24"		28							W				
			29											
			30	SILTY SAND, light brown, fine grained.										
			31											
			32											
S5	30"		33		SM					W				
			34											
			35											
			36	POORLY GRADED SAND, light brown, fine to medium grained.										
			37											
S6	57"		38							W				
			39		SP									
			40											
			41											
				POORLY GRADED SAND, orange, fine grained.	SP									
			42	SANDY SILT WITH GRAVEL, sand is fine grained.	ML									

Boring Number MW-304A

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S7	54"		43	SANDY SILT WITH GRAVEL, sand is fine grained.*(continued)*	ML					W				
			44											
			45	POORLY GRADED SAND, light brown, fine grain, trace coarse grained.	SP									
S8	9"		46	SANDY SILT WITH GRAVEL, light brown with trace yellow, fine grained.						W				
			47											
			48		ML									
S9	48"		49							W				
			50											
			51	End of boring at 51 feet.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL Lansing Generating Station SCS#: 25218221.00		MW305

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Eric Wetzel Roberts Environmental Drilling, Inc.	5/16/2019	5/16/2019	4.25" HSA

Unique Well No	DNR Well ID No	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW305	629.12 Feet MSL	631.8 Feet MSL	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,958,109 N, 5,541,533 E S/C/N
SE 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 9.5 feet.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	FAT CLAY, dark greenish gray, (GLEY 13/10Y), soft, trace red sand, wood pieces and roots										
	24	1 1 1 1	11							W				
			12		CH									
	24	0 0 0 2	13							W				
			14	Sand seams at 13.5 and 14.5 feet.										
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: For Zach Watson

Firm: SCS Engineers
2830 Dairy Drive, Madison, WI 53718

Tel:
Fax:

Boring Number MW305 Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
				FAT CLAY, dark greenish gray, (GLEY 13/10Y), soft, trace red sand, wood pieces and roots. *(continued)*	CH					W				
			16	End of Boring at 16 feet.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL Lansing Generating Station SCS#: 25218221.00		MW306

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Eric Wetzel Roberts Environmental Drilling, Inc.	5/16/2019	5/16/2019	4.25" HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW306	623.05 Feet MSL	636.7 Feet MSL	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,958,977 N, 5,541,203 E S/C/N
NE 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 12 feet.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10											
			11											
			12	POORLY GRADED SAND, medium to coarse, rusty in color, (10YR 4/6), trace fine silt.										
	12	1 2 4 3	13		SP					W				
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature for Brad Watson

Firm SCS Engineers
2830 Dairy Drive, Madison, WI 53718

Tel:
Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW306 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
	18	1 2 2 4		POORLY GRADED SAND, medium to coarse, rusty in color, (10YR 4/6), trace fine silt *(continued)*						W				
			16	Same as above but gray, (10YR 4/2).										
	18	1 1 2 2	17							W				
			18											
	18		19							W				
			20											
	18		21		SP					W				
			22											
	18	3 1 2 2	23							W				
			24											
	18	2 1 3 2	25							W				
			26	End of Boring at 26 feet.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL - Lansing Generating Station SCS#: 25218221.00		MW-306A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	12/17/2019	12/18/2019	Rotosonic

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			16.3 Feet	636.7 Feet	6 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3958980.99 N, 5541196.46 E S / C / N
NE 1/4 of NW 1/4 of Section 02, T 98 N, R 03 W
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Allamakee	Lansing

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovac to 9' to check for utilities.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	POORLY GRADED SAND, reddish brown, trace shells, medium grained.										
			11											
			12											
S1	52"		13		SP					W				
			14											
			15											
			16											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers	Fax:

Boring Number MW-306A

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			17	POORLY GRADED SAND, reddish brown, trace shells, medium grained. *(continued)*										
S2	56"		18		SP					W				
			19											
			20	POORLY GRADED SAND, gray, fine to medium grained, trace coarse grained and shells.										
			21											
			22											
S3	57"		23							W				
			24											
			25	Same, mostly medium grained with fine grained.										
			26											
			27											
S4	54"		28							W				
			29											
			30	Same, fine to medium grained with trace coarse grained.	SP									
			31											
			32											
S5	58"		33							W				
			34											
			35	Same with shell fragments.										
			36											
			37											
S6	53"		38							W				
			39											
			40											
			41	LEAN CLAY, dark gray, massive, very dense with roots and sticks.										
			42		CL									

Boring Number MW-306A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S7	58"		43	LEAN CLAY, dark gray, massive, very dense with roots and sticks. *(continued)*	CL					W				
			44	POORLY GRADED SAND, gray to dark gray, fine grained, trace coarse grain with shell fragments.										
			45											
			46											
			47		SP									
S8	52"		48							W				
			49											
			50	POORLY GRADED SAND, light gray, fine to medium grained.										
			51		SP									
			52	POORLY GRADED SAND, reddish tan, fine to medium grained with shell fragments.										
S9	58"		53							W				
			54		SP									
			55											
			56	End of boring at 56 feet.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-307

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/22/2021	6/22/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		628.5 Feet	640.70 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,777 N, 5,541,269 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43 ° 20 ' 2.56 "
Long -91 ° 10 ' 9.97 "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 12' below ground surface with some cave-in to about 10'.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4) with 4" layer of gray sand (10YR 5/1), shells and subroundd gravel.										
S1	60		11		SP					W				
			12											
			13											
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-307

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	Same as above , shells still present with more gray sand.	SP									
			17											
S2	60		18	SILT, dark gray to black (5Y 2.5/2), with trace very fine grained sand and gravel/cobbles.	ML				0.75	W/M				
			19											
			20	Same as above but gray (5Y 4/1).										
S3	12		21							W/M				
				End of boring at 21' below ground surface.										
				Well placed from 20' with 10' screen at 20 to 10'.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-307A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/22/2021	6/22/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		622.8 Feet	640.60 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,775 N, 5,541,261 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43 ° 20 ' 2.54 "
Long -91 ° 10 ' 10.08 "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1–9	Hydrovaced to 12' below ground surface with some cave-in to about 10'.										
S1	60		10–15	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4) with 8" layer of gray sand (10YR 5/1) with trace shells and sub-rounded gravel.	SP					M/W				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

Boring Number MW-307A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S2	48		16–20		SP					W				
			20	SILT, dark gray, dark gray to black, (5Y 2.5/2) with fine grained sand and trace gravel.										
S3	60		21–25		ML				1.5-2.5	M				
			25	LEAN CLAY, black (5Y 2.5/1), soft.										
S4	60		26–30						0.75	W				
			30	Same as above but very soft with trace fine to medium grained sand.	CL									
S5	60		31–35						0.0	M/W				
			35	POORLY GRADED GRAVEL WITH SAND, fine to coarse gravel, sub-rounded to sub-angular, sand is fine to coarse grained, dark brownish gray (2.5Y 4/2) with trace silt.										
S6	24		36–40		GP				0.0	W				

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-307A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			41		GP									
			41	SILT, dark gray (5Y 3/1), with trace sand, gravel and cobbles.	ML									
			42	WELL GRADED SAND, fine to medium grained, yellow (2.Y 7/6) with gravel and pieces of shell.	SW									
S7	56		43	SILT, dark gray (5Y 4/1) and transitions to olive brown (2.5Y 4/4), very soft.	ML				0.0	W				
			44											
			45	POORLY GRADED SAND, fine to medium grained, light olive brown (2.5Y 5/4) with trace silt.	SP									
			46											
			47	SANDY SILT, light olive brown (2.5Y 5/3), very soft, sand is fine to medium grained.	ML									
			48	SILTY SAND, fine to coarse grained, olive yellow (2.5Y 6/8).	SM									
S8	70		49	POORLY GRADED GRAVEL WITH SAND AND SILT, coarse gravel, sand and silt are light olive brown (2.5Y 5/4), sand is fine to coarse grained.	GP-GM				0.0	W				
			50	SANDY SILT WITH GRAVEL, gray to dark gray (2.5Y 4/1), sand is fine to coarse grained, gravel is coarse, sub-rounded with trace cobbles, very soft.	ML									
			51											
			52	End of boring at 52' below ground surface.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-308

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/22/2021	6/22/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		618.8 Feet	635.70 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,958,236 N, 5,541,333 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43 ° 20 ' 7.07 "
Long -91 ° 10 ' 8.94 "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			1	Hydrovaced to 8 feet below ground surface and blind drilled the from 8 to 10'.										Blind drilled 2 ft of slough from 8 to 10' bgs.
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	WELL SORTED SAND, fine to coarse grained, very dark grayish brown (10YR 3/2).	SW									
			11	SILT, gray to dark gray (2.5Y 3/2) with sticks, roots, and trace sand throughout, very soft.										
			12											
S1	60		13		ML				0.0	W				
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-308

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	Same as above but with trace roots, no sticks, and pockets of sand, very sort.										
			17											
S2	60		18		ML				0.0	W				
			19											
			20	Same as above but very trace roots.										
S3	40		21	SANDY SILT, gray to dark gray, (2.5Y 3/2), no visible roots, very soft.	ML				0.0	W				slough in hole, actual recovery was ~2"
			22	End of boring at 22' below ground surface.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-309

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/23/2021	6/23/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		619.4 Feet	636.10 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,958,229 N, 5,541,010 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43° 20' 7.10"
Long -91° 10' 13.31"
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 8' below ground surface.										
			1	Hole collapsed to 6' bgs.										
			2											
			3											
			4											
			5											
			6	WELL GRADED SAND, fine to coarse grained, grayish brown to brown (10YR 4/3) with trace coal (slough).										
S1	20		7											
			8		SP									Slough from 6 to 10 feet.
			9											
			10	SILT, dark gray to black (5Y 2.5/1) with trace roots, 4" layer of black organic soil with trace gravel and sticks.										
			11											
			12		ML-OL									
S2	60		13											
			14											
			14	SILTY SAND WITH GRAVEL, fine to coarse grained, gray to dark gray (5Y 4/1), gravel is	SM									
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-309

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	sub-rounded. SILT, dark gray (5Y 3/1), with roots and trace sticks, very soft.										
S3	60		17		ML									
			18											
			19											
			20	SANDY SILT, very dark gray (5Y 3/1) with roots, trace gravel and peices of limestone at bottom of sample, sand is fine to medium grain.										
			21											
S4	60		22		ML									
			23											
			24											
			25	End of boring at 25' below ground surface. Well placed from 22' with 10' screen at 22 to 12'.										

Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL-Lansing Generating Station Permit No.:

Well or Piezometer No: MW-301

Dates Started: 11/2/15 Date Completed: 11/2/15

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NW

Distance & direction along boundary: 540' SE

Distance & direction from boundary to wall: 230' NE

Elevations (± 0.01 ft MSL):

Ground Surface: 639.35

Top of protective casing: 642.18

Top of well casing: 641.61

Benchmark elevation: 622.86, NAVD 1988 datum

Benchmark description: CP 300, iron rod in concrete

B. SOIL BORING INFORMATION

Name & Address of Construction Company:
Cascade Drilling
301 Alderson St.
Schofield, WI 54476

Name of Driller: Mike Mueller

Drilling Method: HSA

Drilling Fluid: None

Bore Hole Diameter: 8"

Soil Sampling Method: Spoon

Depth of Boring: 26

C. MONITORING WELL INSTALLATION

Casing material: PVC

Length of casing: 15 ft

Outside casing diameter: 2.40"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: .010

Screen length: 10 ft

Depth of well: 25 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 300 lbs

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: Gravity

Volume:

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6"

Material of grout between protective casing and well casing: sand

Protective cap:

Material: steel

Vented: ☒ Yes ☐ No Locking: ☐ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☒ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 17.63 Stabilization Time: 2 hrs.

Well development method: Surged and pumped. Turbidity reduced but not eliminated.

Average depth of frostline: 4 ft.

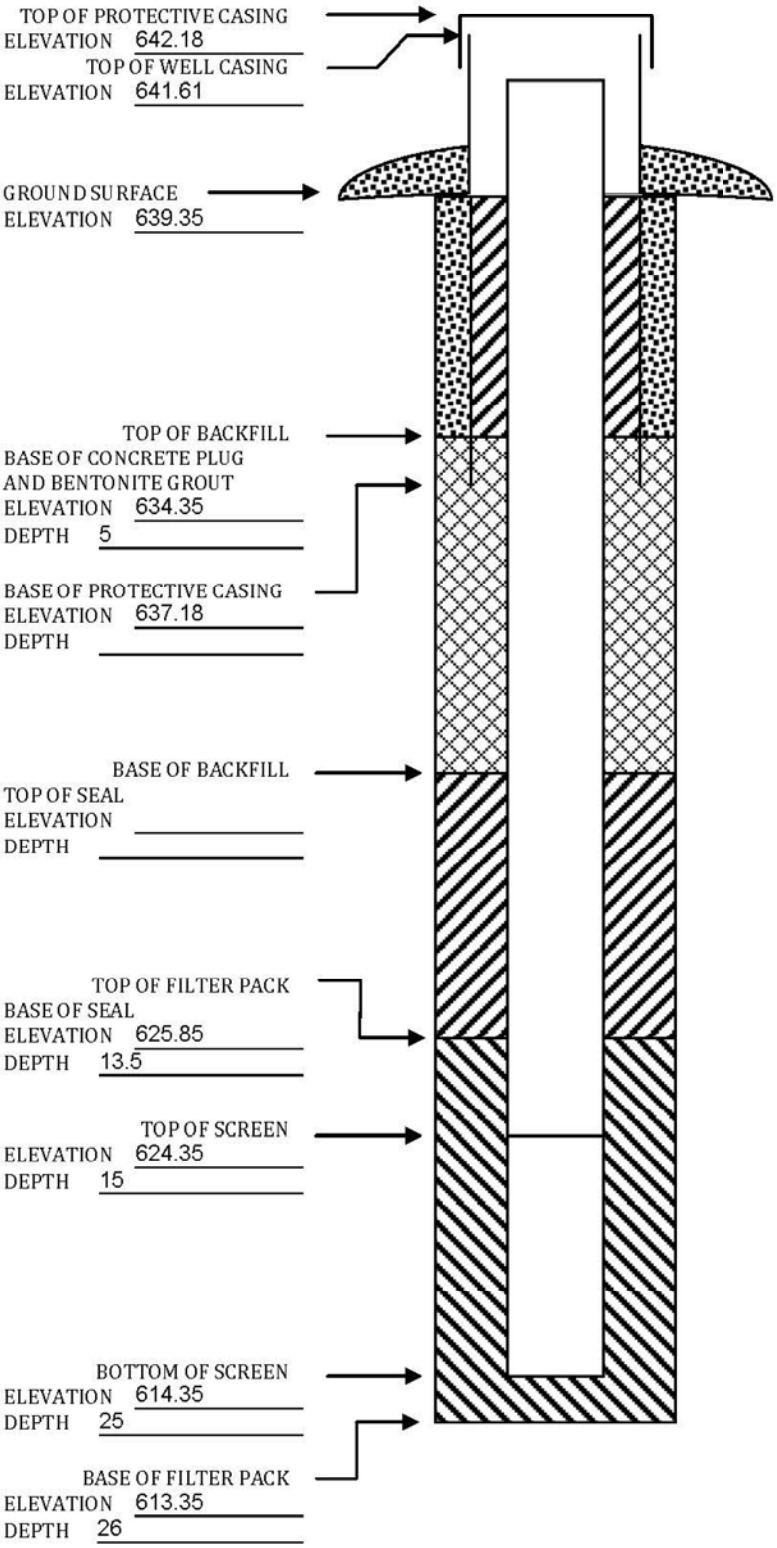
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL-Lansing Generating Station Permit No.:

Well or Piezometer No: MW-302

Dates Started: 11/4/15 Date Completed: 11/4/15

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NW

Distance & direction along boundary: 465' SE

Distance & direction from boundary to wall: 405' NE

Elevations (± 0.01 ft MSL):

Ground Surface: 635.85

Top of protective casing: 638.72

Top of well casing: 638.40

Benchmark elevation: 633.86, NAVD 1988 datum

Benchmark description: CP 300, iron rod in concrete

B. SOIL BORING INFORMATION

Name & Address of Construction Company:

Cascade Drilling

301 Alderson St.

Schofield, WI 54476

Name of Driller: Mike Mueller

Drilling Method: HSA

Drilling Fluid: None

Bore Hole Diameter: 8"

Soil Sampling Method: Spoon

Depth of Boring: 20 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC

Length of casing: 9'

Outside casing diameter: 2.40"

Inside casing diameter: 2"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC

Screen opening size: .01"

Screen length: 10'

Depth of well: 19'

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 120 lbs

Seal (minimum 3 ft length above filter pack):

Material: 3/8" hole plug

Placement method: Gravity

Volume:

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6"

Material of grout between protective casing and well casing: sand

Protective cap:

Material: steel

Vented: ☑ Yes ☐ No Locking: ☐ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 9.95 Stabilization Time: 2 hrs.

Well development method: Surged and pumped. Turbidity reduced but not removed.

Average depth of frostline: 4 ft.

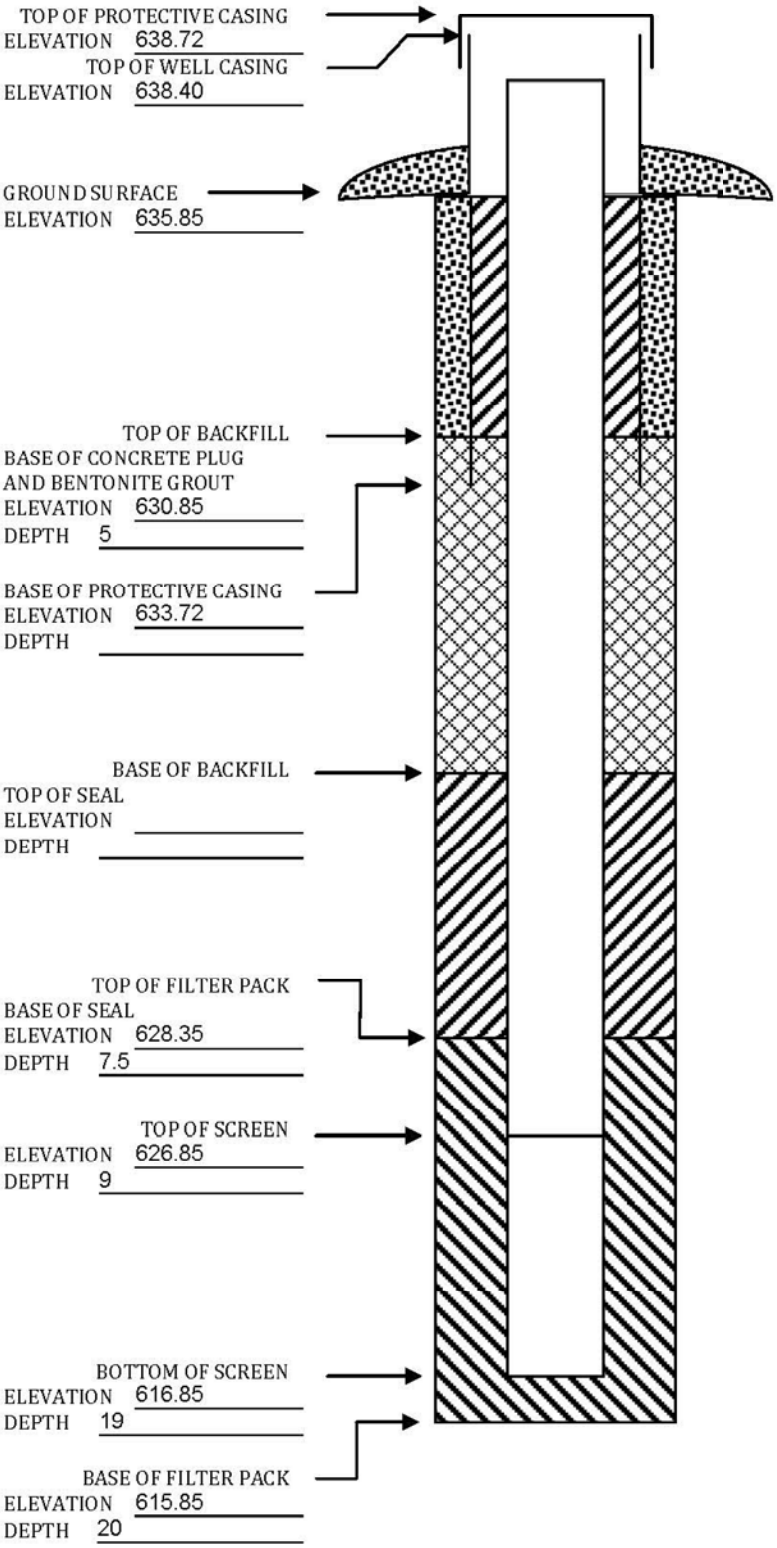
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Lansing Generating Station — Permit No.:

Well or Piezometer No.: MW-302A — Dates Started: 12/16/2019 — Date Completed: 12/19/2019

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: NW — Distance and direction along boundary: 375 E

Distance and direction from boundary to surface monitoring well: 0 S

Elevation (+0.01 ft. MSL)

Ground Surface: 636.2' — Top of protective casing: 638.93'

Top of well casing: 638.68' — Benchmark elevation: 653.26'

Benchmark description: Brass cap in PCC walkway to weir structure on north side of entrance road

B. SOIL BORING INFORMATION

Construction Company Name: Cascade Drilling

Address: 301 Alderson St. — City, State, Zip Code: Schofield, WI. 54476

Name of driller: Paul Dickinson

Drilling method: Rotosonic — Drilling fluid: Water — Bore Hole diameter: 6"

Soil sampling method: Sample bag — Depth of boring: 50'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 40 PVC

Length of casing: 52.45'

Outside casing diameter: 2.4"

Inside casing diameter: 2.04"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC

Screen opening size: 0.01'

Screen length: 5'

Depth of Well: 49'

Filter Pack:

Material: Filter Sand

Grain Size: #40 red flint, topped with #7

Volume: 2 cu. ft.

Seal (minimum 3 ft. length above filter pack):

Material: Bentonite Chips

Placement method: Poured

Volume: 2 cu. ft.

Backfill (if different from seal):

Material: Bentonite grout

Placement method: Pumped

Volume: 60 gal.

Surface seal design: Protop

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap: 6" Royer cap

Material: Aluminum

Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic and rubber

Vented?: ☐ Y ☒ N

D. GROUNDWATER MEASUREMENT (±0.01 foot below top of inner well casing)

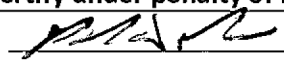
Water level: 15.88' — **Stabilization time**: < 1 minute

Well development method: Surged and pumped

Average depth of frost line: 4 ft

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature:  — **Certification #**: 9361 — **Date**: 12-19-2019

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

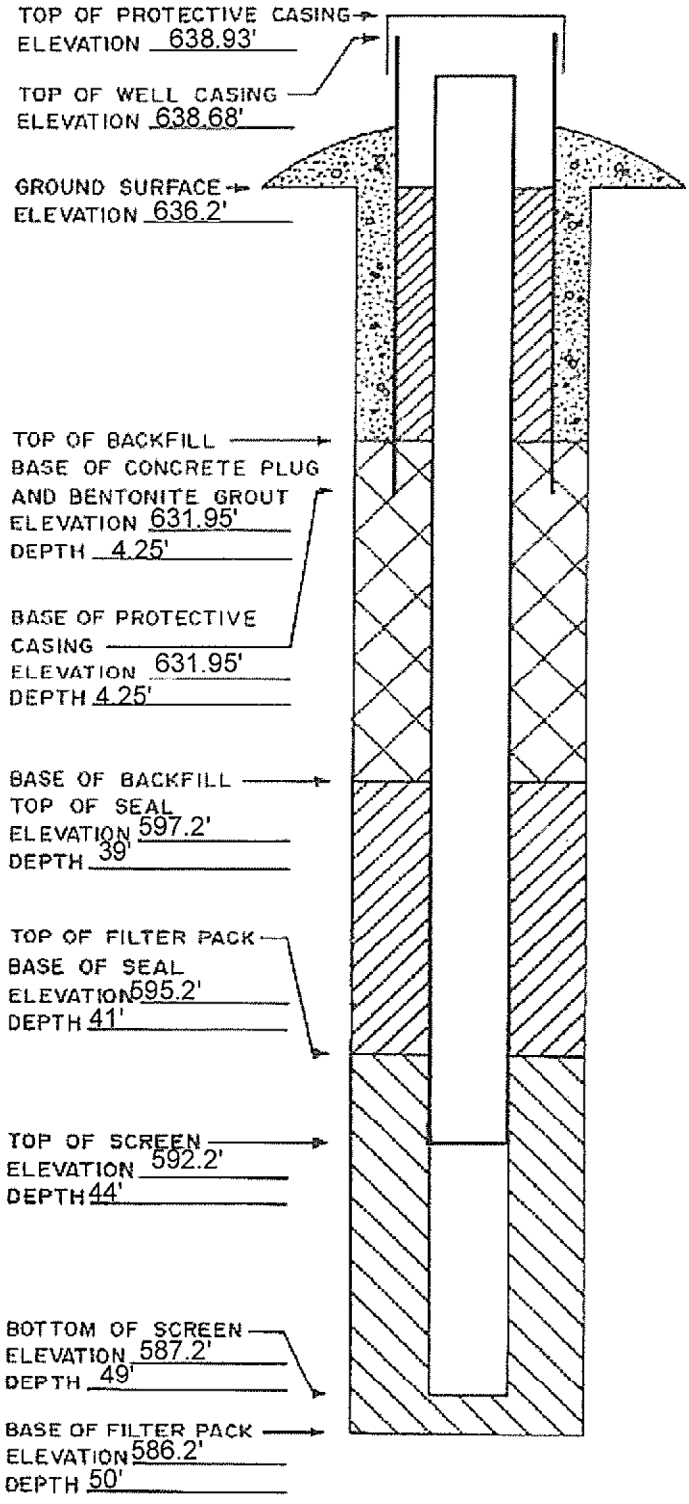
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL).



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL-Lansing Generating Station Permit No.:

Well or Piezometer No: MW-303

Dates Started: 11/3/15 Date Completed: 11/4/15

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NW

Distance & direction along boundary: 730' SE

Distance & direction from boundary to wall: 760' NE

Elevations (± 0.01 ft MSL):

Ground Surface: 653.85

Top of protective casing: 656.74

Top of well casing: 656.27

Benchmark elevation: 633.86, NAVD 1988 datum

Benchmark description: CP 300, iron rod in concrete

B. SOIL BORING INFORMATION

Name & Address of Construction Company:
Cascade Drilling
301 Alderson St
Schofield, WI 54476

Name of Driller: Mike Mueller

Drilling Method: HSA

Drilling Fluid: None

Bore Hole Diameter: 8"

Soil Sampling Method: Spoon

Depth of Boring: 27 feet

C. MONITORING WELL INSTALLATION

Casing material: PVC

Length of casing: 16

Outside casing diameter: 2.40"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: .01"

Screen length: 10'

Depth of well: 26'

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 250 lbs

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: Gravity

Volume:

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6"

Material of grout between protective casing and well casing: sand

Protective cap:

Material: steel

Vented: ☑ Yes ☐ No Locking: ☐ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 16.35 Stabilization Time: < 1 hr.

Well development method: Surged and pumped to reduce turbidity

Average depth of frostline: 4'

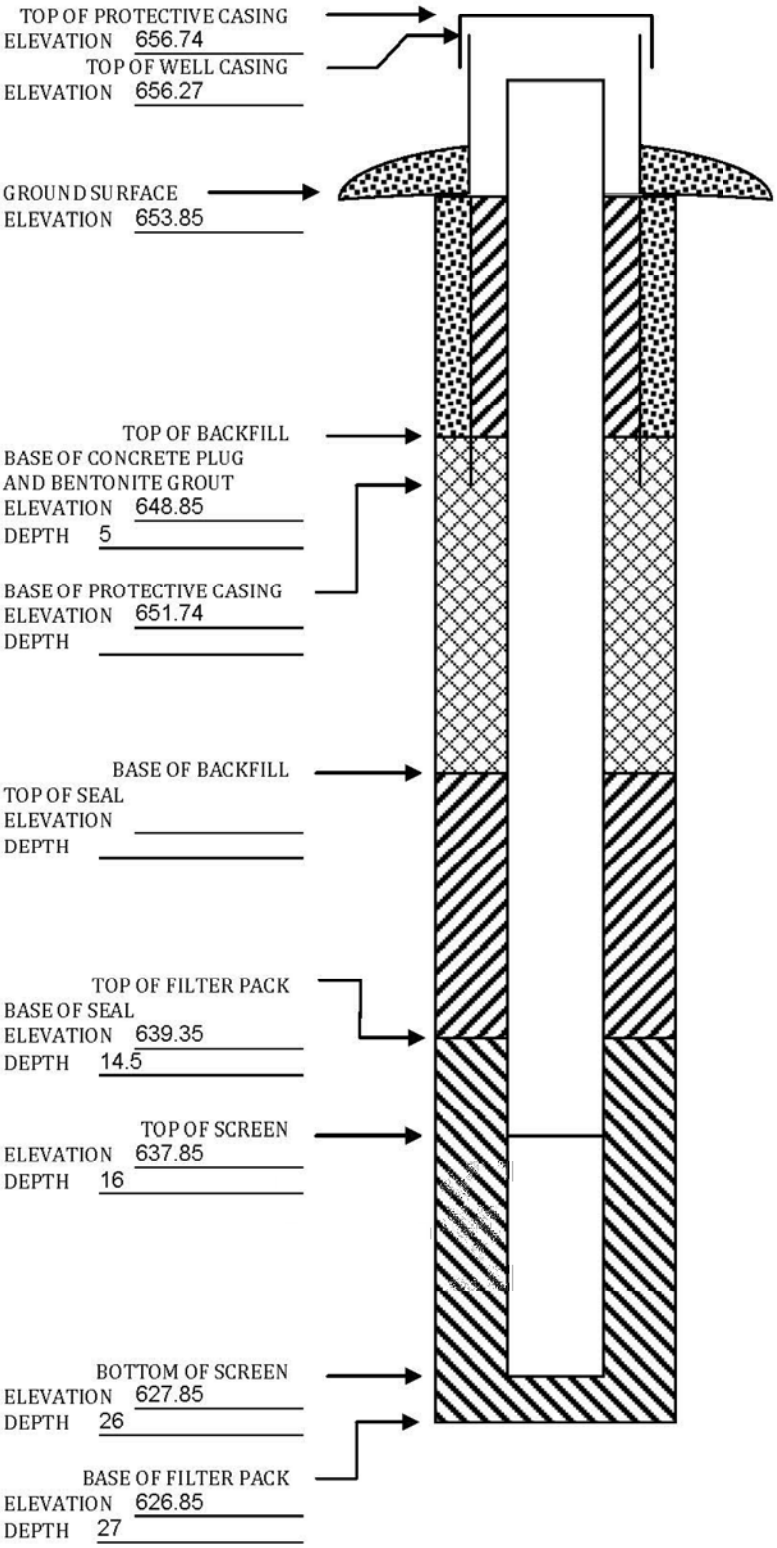
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Lansing Generating Station — Permit No.:

Well or Piezometer No.: MW304 — Dates Started: 5/15/2019 — Date Completed: 5/15/2019

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: NW — Distance and direction along boundary: 1,340 S

Distance and direction from boundary to surface monitoring well: 10 E

Elevation (+0.01 ft. MSL):

Ground Surface: 635.47 — Top of protective casing: 636.68

Top of well casing: 636.43 — Benchmark elevation: 653.26

Benchmark description: Brass cap in PCC walkway to weir structure on north side of entrance road

B. SOIL BORING INFORMATION

Construction Company Name: Roberts Environmental Drilling Inc.

Address: 1107 South Mulberry Street — City, State, Zip Code: Millstadt, IL, 62260

Name of driller: Eric Wetzel

Drilling method: 4 1/4" HSA — Drilling fluid: None — Bore Hole diameter: 8.5"

Soil sampling method: Split Spoon — Depth of boring: 22'

C. MONITORING WELL INSTALLATION

Casing material: PVC

Length of casing: 20.26'

Outside casing diameter: 2.4"

Inside casing diameter: 2.0"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC

Screen opening size: 0.01'

Screen length: 10'

Depth of Well: 20'

Filter Pack:

Material: Filter Sand

Grain Size:

Volume: 19.4 cubic feet

Seal (minimum 3 ft. length above filter pack):

Material: Bentonite

Placement method: Gravity

Volume:

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design: Concrete

Material of protective casing: Steel

Material of grout between protective casing and well casing: Bentonite chips

Protective cap:

Material: Steel

Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic

Vented?: ☒ Y ☐ N

D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level: 13.21' — **Stabilization time:** <1 hour

Well development method: Surged & pumped to reduce turbidity

Average depth of frost line: 4

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature: [signature] — **Certification #:** 11509 — **Date:** 8/8/2019

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

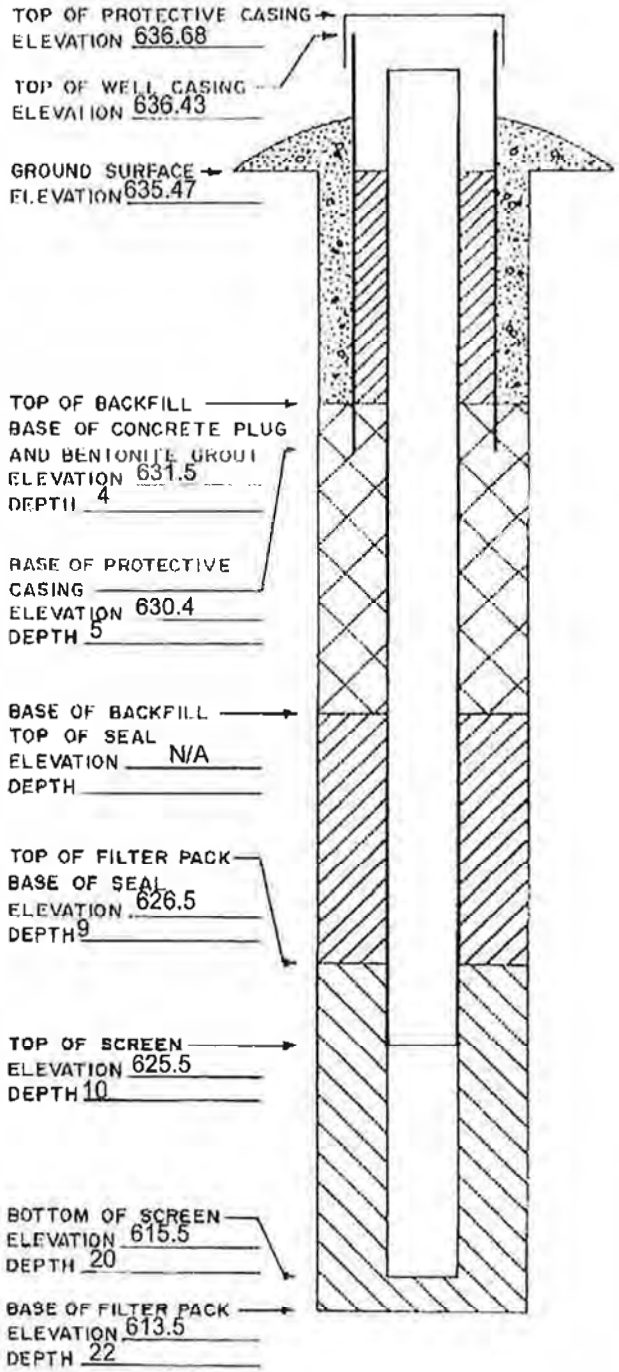
09/2017 cmc

DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL).



MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Lansing Generating Station — Permit No.:

Well or Piezometer No.: MW-304A — Dates Started: 12/18/2019 — Date Completed: 12/19/2019

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: NW — Distance and direction along boundary: 1340 S

Distance and direction from boundary to surface monitoring well: 10 E

Elevation (+0.01 ft. MSL)

Ground Surface: 635.6 — Top of protective casing: 638.6

Top of well casing: 638.36 — Benchmark elevation: 653.26

Benchmark description: Brass cap in PCC walkway to weir structure on north side of entrance road

B. SOIL BORING INFORMATION

Construction Company Name: Cascade Drilling

Address: 301 Alderson St. — City, State, Zip Code: Schofield, WI. 54476

Name of driller: Paul Dickinson

Drilling method: Rotosonic — Drilling fluid: Water — Bore Hole diameter: 6"

Soil sampling method: Sample bag — Depth of boring: 51'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 80 PVC — Placement method: Poured

Length of casing: 52.45' — Volume: 2 cu. ft.

Outside casing diameter: 2.4" — Backfill (if different from seal):

Inside casing diameter: 1.939" — Material: Bentonite grout

Casing joint type: Threaded — Placement method: Pumped

Casing/screen joint type: Threaded — Volume: 60 gal.

Screen material: PVC — Surface seal design: Protop

Screen opening size: 0.01' — Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Screen length: 5'

Depth of Well: 50' — Protective cap: 6" Royer cap

Filter Pack: — Material: Aluminum

Material: Filter Sand — Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Grain Size: #40 red flint, topped with #7 — Well cap:

Volume: 1.5cu. ft. — Material: Plastic and rubber

Seal (minimum 3 ft. length above filter pack): — Vented?: ☐ Y ☒ N

Material: Bentonite Chips

D. GROUNDWATER MEASUREMENT (±0.01 foot below top of inner well casing)

Water level: 13.35' — **Stabilization time:** >1hr

Well development method: Surged and pumped

Average depth of frost line: 4 ft

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature: [signature] — **Certification #:** 7361 — **Date:** 12-19-2019

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

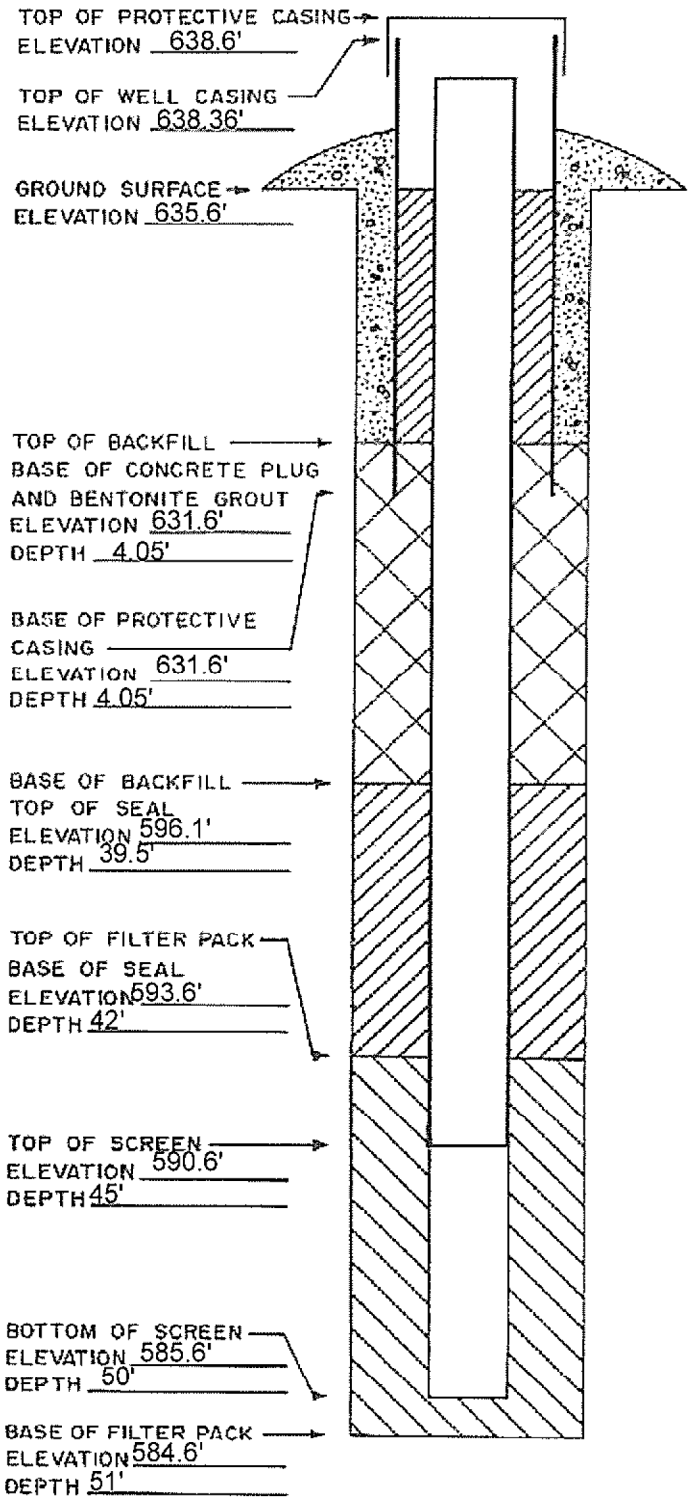
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL).



MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Lansing Generating Station Permit No.:

Well or Piezometer No.: MW305 Dates Started: 5/16/2019 Date Completed: 5/16/2019

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: NW Distance and direction along boundary: 1,125 S

Distance and direction from boundary to surface monitoring well: 630 E

Elevation (+0.01 ft. MSL):

Ground Surface: 631.75 Top of protective casing: 634.32

Top of well casing: 633.87 Benchmark elevation: 653.26

Benchmark description: Brass cap in PCC walkway to weir structure on north side of entrance road

B. SOIL BORING INFORMATION

Construction Company Name: Roberts Environmental Drilling Inc.

Address: 1107 South Mulberry Street City, State, Zip Code: Millstadt, IL, 62260

Name of driller: Eric Wetzel

Drilling method: 4 1/4" HSA Drilling fluid: Bore Hole diameter: 8.5"

Soil sampling method: Split Spoon Depth of boring: 16'

C. MONITORING WELL INSTALLATION

Casing material: PVC

Length of casing: 5'

Outside casing diameter: 2.4"

Inside casing diameter: 2.0"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC

Screen opening size: 0.01'

Screen length: 10'

Depth of Well: 14.5'

Filter Pack:

Material: Filter Sand

Grain Size:

Volume: 23 bags

Seal (minimum 3 ft. length above filter pack):

Material: Bentonite

Placement method: Gravity

Volume: 2.7 cubic ft

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design: Concrete

Material of protective casing: Steel

Material of grout between protective casing and well casing: Bentonite chips

Protective cap:

Material: steel

Vented?: ☒ Y ☐ N Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic

Vented?: ☒ Y ☐ N

D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level: 12.13' **Stabilization time:** < 1 hr

Well development method: Surged and pumped to remove turbidity

Average depth of frost line: 4 ft

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature: **Certification #:** 11509 **Date:** 8/8/2019

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

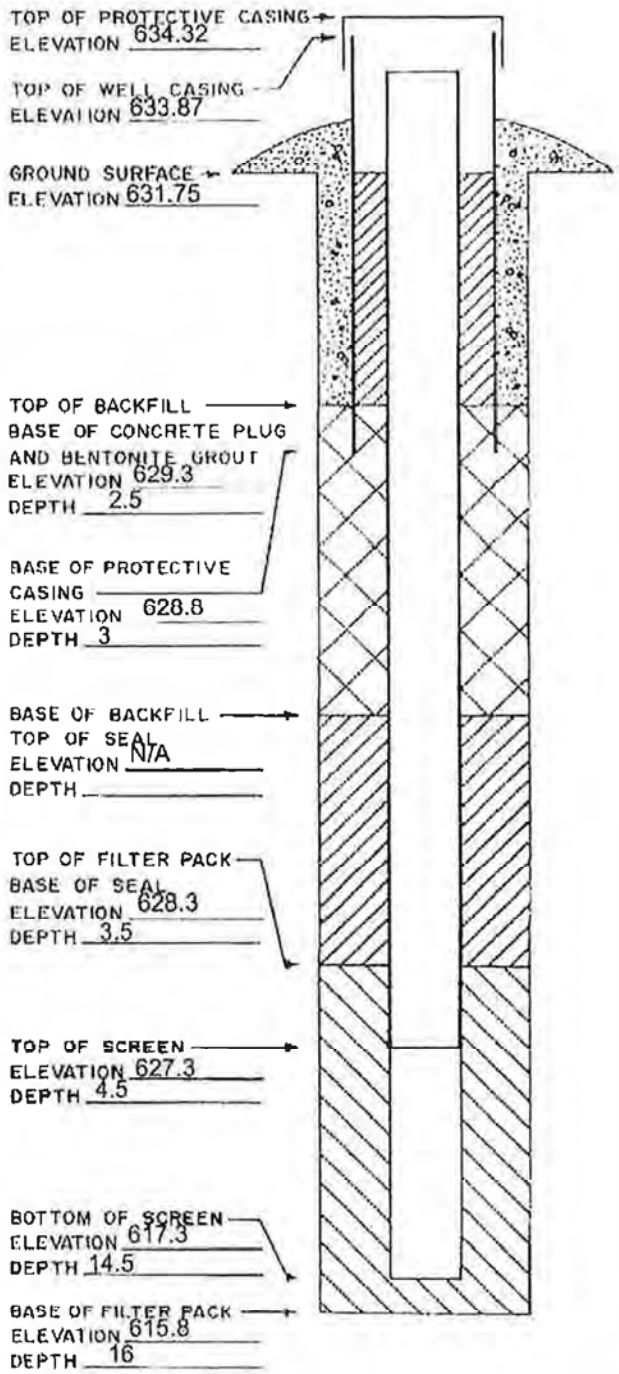
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL).



MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Lansing Generating Station — Permit No.:

Well or Piezometer No.: MW306 — Dates Started: 5/16/2019 — Date Completed: 5/16/2019

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: NW — Distance and direction along boundary: 420 SE

Distance and direction from boundary to surface monitoring well: 60 SW

Elevation (+0.01 ft. MSL):

Ground Surface: 636.74 — Top of protective casing: 637.71

Top of well casing: 637.48 — Benchmark elevation: 653.26

Benchmark description: Brass cap in PCC walkway to weir structure on north side of entrance road

B. SOIL BORING INFORMATION

Construction Company Name: Roberts Environmental Drilling Inc.

Address: 1107 South Mulberry Street — City, State, Zip Code: Millstadt, IL, 62260

Name of driller: Eric Wetzel

Drilling method: 4 1/4" HSA — Drilling fluid: — Bore Hole diameter: 8.5"

Soil sampling method: Split Spoon — Depth of boring: 26'

C. MONITORING WELL INSTALLATION

Casing material: PVC

Length of casing: 26'

Outside casing diameter: 2.4"

Inside casing diameter: 2.0"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC

Screen opening size: 0.01'

Screen length: 10'

Depth of Well: 25'

Filter Pack:

Material: Filter Sand

Grain Size:

Volume: 37 cubic feet

Seal (minimum 3 ft. length above filter pack):

Material: Bentonite

Placement method: Gravity

Volume:

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design: Concrete

Material of protective casing: Steel

Material of grout between protective casing and well casing: Bentonite chips

Protective cap:

Material: Steel

Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic

Vented?: ☒ Y ☐ N

D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level: 13.11' — **Stabilization time:** <1 hr

Well development method: Surged and pumped to reduce turbidity

Average depth of frost line: 4 ft

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature: [signature] — **Certification #:** 11509 — **Date:** 8/8/2019

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

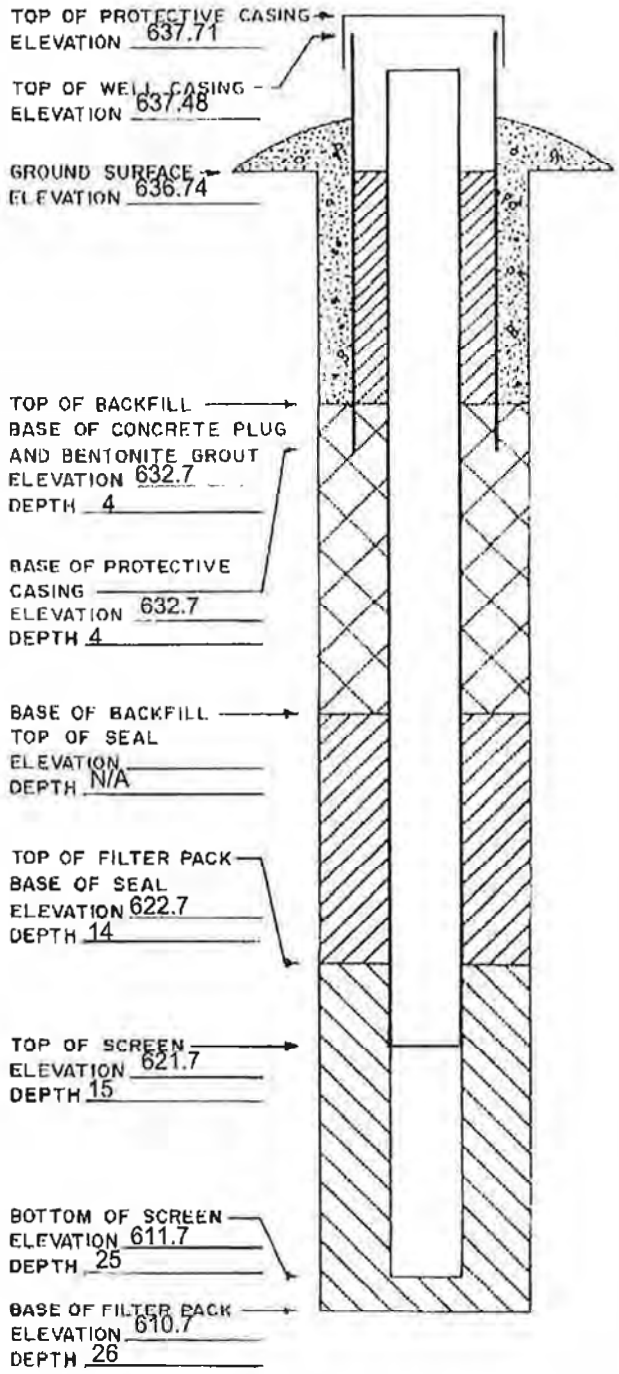
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL)



MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Lansing Generating Station Permit No.:

Well or Piezometer No.: MW-306A Dates Started: 5/17/2019 Date Completed: 12/19/2019

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: NW Distance and direction along boundary: 420 SE

Distance and direction from boundary to surface monitoring well: 60 SW

Elevation (+0.01 ft. MSL):

Ground Surface: 636.7 Top of protective casing: 639.56

Top of well casing: 639.33 Benchmark elevation: 653.26

Benchmark description: Brass cap in PCC walkway to weir structure on north side of entrance road

B. SOIL BORING INFORMATION

Construction Company Name: Cascade Drilling

Address: 301 Alderson St. City, State, Zip Code: Schofield, WI. 54476

Name of driller: Paul Dickinson

Drilling method: Rotosonic Drilling fluid: Water Bore Hole diameter: 6"

Soil sampling method: Sample bag Depth of boring: 56'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 80 PVC

Length of casing: 58.06'

Outside casing diameter: 2.4"

Inside casing diameter: 1.939"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC

Screen opening size: 0.01'

Screen length: 5'

Depth of Well: 55'

Filter Pack:

Material: Filter Sand

Grain Size: #40 red flint, topped with #7

Volume: 1.5cu. ft.

Seal (minimum 3 ft. length above filter pack):

Material: Bentonite Chips

Placement method: Poured

Volume: 2 cu. ft.

Backfill (if different from seal):

Material: Bentonite grout

Placement method: Pumped

Volume: 60 gal.

Surface seal design: Protop

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap: 6" Royer cap

Material: Aluminum

Vented?: ☒ Y ☐ N Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic and rubber

Vented?: ☐ Y ☒ N

D. GROUNDWATER MEASUREMENT (±0.01 foot below top of inner well casing)

Water level: 19.56' **Stabilization time**: < 1 minute

Well development method: Surged and pumped

Average depth of frost line: 4 ft

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature: [signature] **Certification #**: 9361 **Date**: 12-19-2019

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

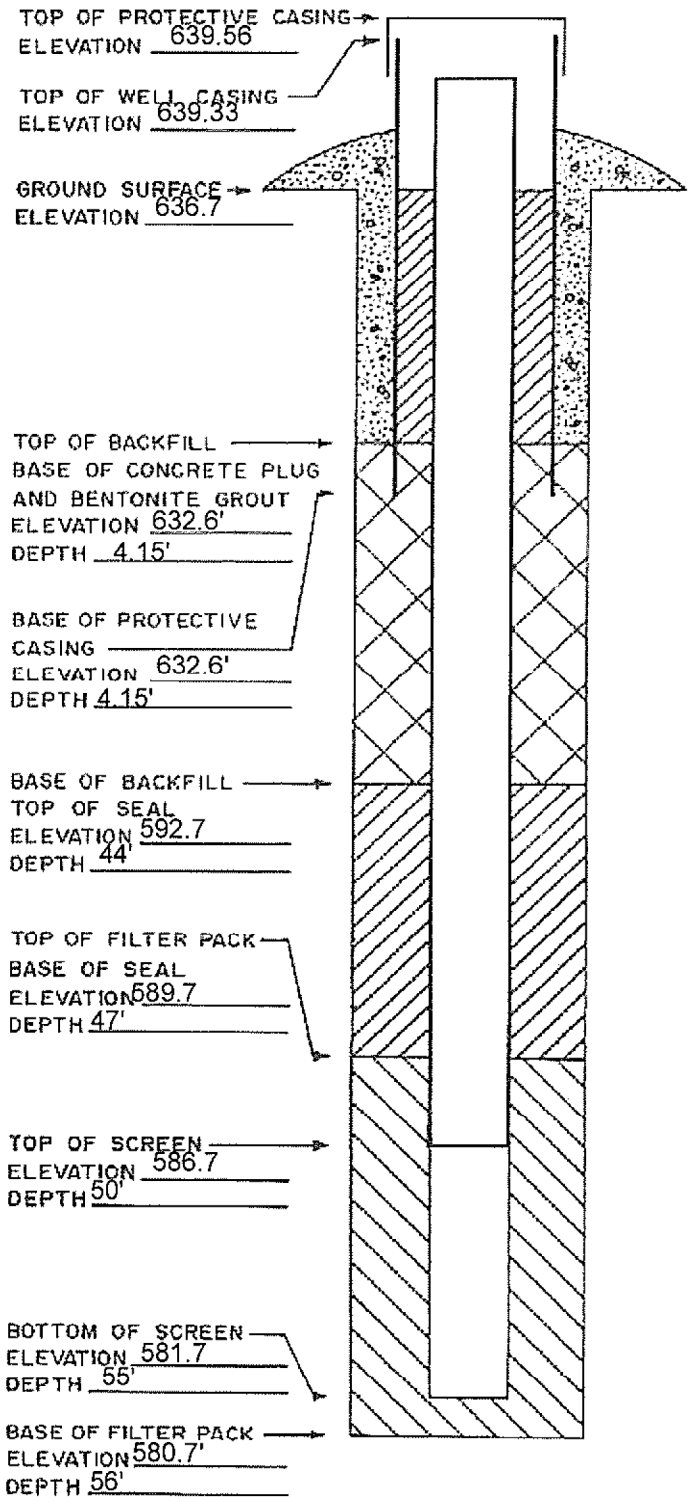
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL).



SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-307

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/22/2021	6/22/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		628.5 Feet	640.70 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,777 N, 5,541,269 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43 ° 20 ' 2.56 "
Long -91 ° 10 ' 9.97 "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 12' below ground surface with some cave-in to about 10'.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4) with 4" layer of gray sand (10YR 5/1), shells and subroundd gravel.										
S1	60		11		SP					W				
			12											
			13											
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-307

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	Same as above , shells still present with more gray sand.	SP									
			17											
S2	60		18	SILT, dark gray to black (5Y 2.5/2), with trace very fine grained sand and gravel/cobbles.	ML				0.75	W/M				
			19											
			20	Same as above but gray (5Y 4/1).										
S3	12		21							W/M				
				End of boring at 21' below ground surface.										
				Well placed from 20' with 10' screen at 20 to 10'.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-307A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/22/2021	6/22/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		622.8 Feet	640.60 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,957,775 N, 5,541,261 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43 ° 20 ' 2.54 "
Long -91 ° 10 ' 10.08 "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1–9	Hydrovaced to 12' below ground surface with some cave-in to about 10'.										
S1	60		10–15	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4) with 8" layer of gray sand (10YR 5/1) with trace shells and sub-rounded gravel.	SP					M/W				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

Boring Number MW-307A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S2	48		16–20		SP					W				
			20	SILT, dark gray, dark gray to black, (5Y 2.5/2) with fine grained sand and trace gravel.										
S3	60		21–25		ML				1.5-2.5	M				
			25	LEAN CLAY, black (5Y 2.5/1), soft.										
S4	60		26–30						0.75	W				
			30	Same as above but very soft with trace fine to medium grained sand.	CL									
S5	60		31–35						0.0	M/W				
			35	POORLY GRADED GRAVEL WITH SAND, fine to coarse gravel, sub-rounded to sub-angular, sand is fine to coarse grained, dark brownish gray (2.5Y 4/2) with trace silt.										
S6	24		36–40		GP				0.0	W				

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-307A

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			41		GP									
			41	SILT, dark gray (5Y 3/1), with trace sand, gravel and cobbles.	ML									
			42	WELL GRADED SAND, fine to medium grained, yellow (2.Y 7/6) with gravel and pieces of shell.	SW									
S7	56		43	SILT, dark gray (5Y 4/1) and transitions to olive brown (2.5Y 4/4), very soft.	ML				0.0	W				
			44											
			45	POORLY GRADED SAND, fine to medium grained, light olive brown (2.5Y 5/4) with trace silt.	SP									
			46											
			47	SANDY SILT, light olive brown (2.5Y 5/3), very soft, sand is fine to medium grained.	ML									
			48	SILTY SAND, fine to coarse grained, olive yellow (2.5Y 6/8).	SM									
S8	70		49	POORLY GRADED GRAVEL WITH SAND AND SILT, coarse gravel, sand and silt are light olive brown (2.5Y 5/4), sand is fine to coarse grained.	GP-GM				0.0	W				
			50	SANDY SILT WITH GRAVEL, gray to dark gray (2.5Y 4/1), sand is fine to coarse grained, gravel is coarse, sub-rounded with trace cobbles, very soft.	ML									
			51											
			52	End of boring at 52' below ground surface.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-308

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/22/2021	6/22/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		618.8 Feet	635.70 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,958,236 N, 5,541,333 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43 ° 20 ' 7.07 "
Long -91 ° 10 ' 8.94 "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			1	Hydrovaced to 8 feet below ground surface and blind drilled the from 8 to 10'.										Blind drilled 2 ft of slough from 8 to 10' bgs.
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	WELL SORTED SAND, fine to coarse grained, very dark grayish brown (10YR 3/2).	SW									
			11	SILT, gray to dark gray (2.5Y 3/2) with sticks, roots, and trace sand throughout, very soft.										
			12											
S1	60		13		ML				0.0	W				
			14											
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-308

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	Same as above but with trace roots, no sticks, and pockets of sand, very sort.										
			17											
S2	60		18		ML				0.0	W				
			19											
			20	Same as above but very trace roots.										
S3	40		21	SANDY SILT, gray to dark gray, (2.5Y 3/2), no visible roots, very soft.	ML				0.0	W				slough in hole, actual recovery was ~2"
			22	End of boring at 22' below ground surface.										

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Lansing Generating Station SCS#: 25221161.00		MW-309

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Paul Dickinson Cascade Drilling	6/23/2021	6/23/2021	Roto-Sonic

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		619.4 Feet	636.10 Feet	6.0 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 3,958,229 N, 5,541,010 E S / C / N
SW 1/4 of NW 1/4 of Section 2, T 98 N, R 3 W
Lat 43° 20' 7.10"
Long -91° 10' 13.31"
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Allamakee		Lansing, Iowa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 8' below ground surface.										
			1	Hole collapsed to 6' bgs.										
			2											
			3											
			4											
			5											
			6	WELL GRADED SAND, fine to coarse grained, grayish brown to brown (10YR 4/3) with trace coal (slough).										
S1	20		7											
			8		SP									Slough from 6 to 10 feet.
			9											
			10	SILT, dark gray to black (5Y 2.5/1) with trace roots, 4" layer of black organic soil with trace gravel and sticks.										
			11											
			12		ML-OL									
S2	60		13											
			14											
			14	SILTY SAND WITH GRAVEL, fine to coarse grained, gray to dark gray (5Y 4/1), gravel is	SM									
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive, Madison, WI 53718	Fax:

SOIL BORING LOG INFORMATION SUPPLEMENT

Boring Number MW-309

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	sub-rounded. SILT, dark gray (5Y 3/1), with roots and trace sticks, very soft.										
S3	60		17		ML									
			18											
			19											
			20	SANDY SILT, very dark gray (5Y 3/1) with roots, trace gravel and peices of limestone at bottom of sample, sand is fine to medium grain.										
			21											
S4	60		22		ML									
			23											
			24											
			25	End of boring at 25' below ground surface. Well placed from 22' with 10' screen at 22 to 12'.										

Appendix C

Arsenic Assessment Update

ReSolution Partners, LLC

Final

Subject: Assessment of Arsenic in Groundwater at the Interstate Power and Light, Lansing Generating Station

From: Bernd W. Rehm Date: 31 May 2023 Revision 3

Project: SCS – Alliant Lansing GS CCR Evaluations 158-002a

Key Findings

Hydrogeologic and geochemical data show that the coal combustion residue (CCR) in the Upper Ash Pond is not the source of arsenic exceedances of the Groundwater Protection Standard at Monitoring well MW-302. Sampling results and hydrogeologic conditions indicate that arsenic in groundwater is due to released arsenic co-precipitated with existing iron minerals in soil adjacent to and below the former Lower Ash Pond. Low upgradient arsenic concentrations between the Lower Pond area and the Upper Pond, a lack of response in arsenic concentrations to CCR removal from the Former Lower Ash Pond, and observed organic soils that support the production of microbially reducing conditions suggest the groundwater arsenic concentrations above the GPS are due to release from soil adjacent to and below the former Lower Ash Pond.

Hydrogeology

Borings and monitoring wells were completed in surficial sediments in the area of the former Upper and Lower Ash Ponds overlying bedrock to depths on the order of 50 feet below ground surface. The sediments generally consist of interbedded clay, silt, sand and gravel units that show little lateral continuity. Shallow soil adjacent to and immediately below the Former Lower Ash Pond is commonly described as brown of black silt or clay with plant material (e.g. MW-302 boring and CCR Confirmation Core Logs[1]). Three soil samples collected from below the water table at MW-302A (11 to 25 feet below ground surface) had total organic carbon contents of 1.6 to 6.7 percent with an average of 3.4 percent[2].

[1] Hard Hat Services. 2016. Lower Ash Pond Closure Construction Completion Report. Interstate Power & Light Company, Lansing Generating Station, Lansing, Iowa, 487 pp.
[2] Eurofins. 2020. Analytical Report, IPL-Lansing-25220082, 21 pp.

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The Former Lower Ash Pond was removed in 2015[1]. Approximately 6 feet of CCR between 618 and 624 feet elevation was dredged and placed in the Upper Ash Pond. Following confirmation of CCR removal by elevation survey and soil borings, the pond area was filled with dolomite quarry spall to an elevation of ~627 feet and general soil fill to an elevation of ~637 feet. Topsoil and seed were placed over the fill.

When the Lower Ash Pond was closed in 2015, a gravel-filled interceptor trench and drain were also constructed immediately along the north side of the Upper Ash Pond at an elevation of ~630 feet[3]. The trench and drain intercept the shallow groundwater discharge from the Upper Ash Pond. The intercepted groundwater is routed to a weir box that combines the groundwater with the surface water from the Upper Ash Pond before it is discharged to the unnamed creek to the west of the Upper Ash Pond through State-permitted Outfall 002. In November 2021, Outfall 002 was sealed off from the Upper Pond surface water and replaced with Outfall 010 to the Mississippi River and the groundwater collection pipe in the base of the interceptor trench was also filled with concrete[4]. The gravel-filled trench was not changed, therefore shallow groundwater flow was allowed to resume from the Upper Ash Pond through the dolomite quarry spall of the Former Lower Ash Pond.

A cutoff wall was also constructed along the west side of the Upper Ash Pond[5]. The wall is at least 30 inches thick and was made of a mixture of blast furnace slag, Portland cement, bentonite, Polymax additive and water with a design permeability of $< 1 \times 10^{-7}$ cm/s. The wall extended to elevations of ~615 feet on the north and to 640 feet on the south to be keyed into a layer of silt. At the north end of the cutoff wall the base of the wall is on the order of 10 to 15 feet below the elevation of the unnamed creek to the west. The wall precludes shallow Upper Ash Pond seepage and groundwater flow to the unnamed creek.

Shallow groundwater flow from the Upper Ash Pond that is not captured by the inceptor trench flows northward through the backfilled Former Lower Ash Pond and past MW-302 to discharge at an elevation of ~620 feet in the outflow channel that separates the coal pile from the CCR ponds (Figure 1 and 2). The conceptual flow cross-section on

[3] Hard Hat Services. 2016. Lower Ash Pond Closure Construction Completion Report. Interstate Power & Light Company, Lansing Generating Station, Lansing, Iowa, 487 pp.
[4] Tony Morse, Alliant Energy, e-mail to Thomas Karwoski, 10 February 2022.
[5] Hard Hat Services. February 2016. Interstate Power and Light (IPL) Company, Lansing Generating Station Project, Seepage Control Cut-off Wall As-built Drawings. 13 pp.

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Figure 2 suggests that groundwater also flows downward from the Upper Ash Pond and then flows horizontally to discharge to the outfall channel.

Monitoring wells MW-306 and MW-306A are located to the north of the coal pile. The data suggest that there is a mound in the water table below the pile that forms a hydrologic divide between these wells and the Ash Ponds. The results from these wells will therefore not be addressed further.

The unnamed stream to the west of the of the Former Lower and Upper Ponds has an elevation of 630.61 feet before passing beneath the road. The stream elevation appears to fall rapidly until just upstream of the railroad crossing where it joins the larger outfall waterbody at an of elevation 620.54 feet. The combined stream and outfall flow to the north and west. Shallow groundwater also flows northwestward past MW-301 to discharge into the unnamed creek to the west of the CCR ponds.

Monitoring wells MW-304 is installed in the shallow groundwater flow system to the west and upgradient of the unnamed stream that divides groundwater flow between the monitoring wells and the Upper Ash Pond and Former Lower Ash Pond. Even though the well is not hydraulically upgradient of the Upper Ash Pond, it provides a measure of background groundwater quality in the surficial sediment groundwater.

Geochemistry

The data used in the preparation of the following evaluation are summarized in Attachment 1[6].

Arsenic concentrations have been measured in groundwater from the surficial sediment over variable time periods between December 2015 and October 2021. Table 1 summarizes several key averaged geochemical parameters used in the following assessment of the CCR management units.

Arsenic and Oxidation Reduction Potential (ORP). Arsenic concentrations as a function of ORP are provided on Figure 3. Background arsenic concentrations as defined on Figure 3 for MW-304 shallow groundwater average less than 1 µg/L arsenic. The groundwater is slightly alkaline and suboxic (range of 87 to 135 mV). The iron

[6] The data were found in the Alliant Energy, Lansing Generating Station Draft Annual Report, Appendix D.

concentration in both shallow and deep groundwater is generally below the laboratory reporting limit. The sulfate concentration in the deeper well (MW-304A) is on the order of 5 times higher than in the shallower well (MW-304) which reflects an alternate source of groundwater for the deeper flow system[7].

The negative logarithm of the hydrogen ion activity (pH) of the groundwater shows little variability across the site with values that are slightly alkaline (pH 7 to 8 SU). The dissolved solids as measured by specific electrical conductivity (SEC) are comparable to the MW-304 background except for MW-302 where the SEC is approximately doubled. The wells generally produce samples with low suspended solids as indicated by average field turbidity measures of ≤12 nephelometric turbidity units (NTUs). Arsenic, sulfate and iron are addressed in the following paragraphs.

Shallow monitoring wells MW-301, MW-303 and MW-307 are located immediately downgradient of the Upper Ash Pond and upgradient of the Former Lower Ash Pond. As illustrated on Figure 3:

- The average arsenic concentration at MW-301 of 4.2 µg/L is higher than the <1 µg/L background but below the 10 µg/L Groundwater Protection Standard (GPS) and the ORP is highly variable and more than 200 mV less than background.
- MW-303 has an ORP comparable to background with arsenic concentrations on the order of 1 to 3 µg/L, higher than background but below the GPS.
- MW-307 arsenic concentrations are on the order of 1 to 3 µg/L, higher than background but below the GPS and the variable ORP averages -61 mV, well below the background condition.

The combined groundwater and surface water outfall from the Upper Ash Pond[8] collected in June 2020 had an arsenic concentration of 2.33 µg/L, comparable to concentrations at these three monitoring wells (1.4 to 2.3 µg/L).

Arsenic concentrations that range from about 1 to 5 µg/L of arsenic suggest releases from the Upper Ash Pond that are higher than the background but below the 10 µg/L Groundwater Protection Standard (GPS).

[7] SCS Sept. 2021. Alternate source demonstration. February, April and July 2021, Lansing Generating Station. Project No. 25221070.00. 153 pp.
[8] Eurofins. June 2020. Analytical Report Lansing NPDES Permit Renewal 2020, Project No. 50886, 21 pp.

MW-305 is located downgradient of MW-303, nearer to the groundwater discharge boundary formed by the unnamed creek flowing from Outfall 001. The ORP and arsenic concentrations at MW-305 are comparable to MW-303.

MW-302 (Figure 3), downgradient of the Former Lower Ash Pond area, has a significantly lower ORP than the background of -165 mV, and much higher arsenic concentrations ranging from 33 to 53 µg/L (mean of 42 µg/L, n=17). The CCR was removed from the Lower Ash Pond in 2015. Since then, the arsenic concentrations at MW-302 located immediately adjacent to the Former Lower Ash Pond have remained relatively constant between approximately 30 and 50 µg/L from 2015 to 2022 (Figure 4). This suggests that the presence of the CCR in the Lower Ash Pond did not contribute to the arsenic in groundwater at MW-302. Given the low upgradient arsenic concentrations between the Lower Pond area and the Upper Pond and the lack of response in arsenic concentrations to the CCR removal, the arsenic concentrations above the GPS and the very low ORP in MW-302 appear to originate from the sources other than the Upper or Former Lower Ash Ponds.

Arsenic and ORP results from the deeper monitoring wells MW-302A and MW-307A are comparable to the MW-304 background. This is consistent with the conceptual groundwater flow paths illustrated on Figure 2.

Arsenic and Sulfate. The correlations between sulfate concentrations and ORP, and between sulfate and arsenic concentrations are illustrated on Figure 5. Sulfate concentrations in the shallow monitoring wells between the upper and lower ponds are generally above background concentrations, while ORP is lower. There is a significant decrease in sulfate at the low ORP values observed at MW-302. The decrease reflects sulfate reduction to sulfide; even though reduction of sulfate to sulfide at a near neutral pH would be expected to occur when the ORP is less than about -50 mV. A limited number of sulfide measurements made in the field reported no detectable sulfide[9]. The low ORP and low sulfate concentrations are only observed at MW-302, downgradient of the Former Lower Ash Pond area and supports the conclusion that the geochemical changes associated with the occurrence of arsenic are focused in non-CCR materials below and downgradient of the Former Lower Ash Pond .

[9] The lack of sulfide may reflect the reaction of sulfide with other elements resulting in mineral precipitation (e.g. amorphous FeS). The lack of sulfide detection may also be a function of the 'screening level' accuracy provided by the use of Hach field measurement kits.

The monitoring wells near the Upper Ash Pond with 1 to 5 µg/L of arsenic contain on the order of 30 to 60 mg/L of sulfate, or about 2 to 3 times the shallow background levels; indicating some sulfate release from the Upper Ash Pond. This is consistent with sulfate concentrations of the combined surface and groundwater interceptor trench outfall at 22 to 52 mg/L. With flow to the north, the groundwater at MW-302 becomes reducing as a result of the organic-rich sediment encountered near and likely below the former Lower Ash Pond combined with iron- and sulfate-reducing bacteria use of the organic substrate as a carbon source for growth. The sulfate concentrations decrease as the reducing cause the sulfate to form sulfide and the arsenic concentrations increase as the reducing conditions dissolve iron minerals that include adsorbed or coprecipitated arsenic.

Arsenic and Iron. Iron concentrations are summarized on Figure 6. Iron concentrations as a function of ORP show a clearer correlation than sulfate concentrations; with low iron background at oxic ORP, moderate iron concentrations at oxic ORP immediately downgradient of the Upper Ash Pond, and very high iron and anoxic ORP at MW-302 downgradient of the Former Lower Ash Pond. As the dissolved iron concentration increases, the arsenic concentration increases.

Groundwater Discharge to Surface Water. Groundwater from MW-302 discharges to surface water in the outfall channel. Samples of surface water from the outfall channel collected by SCS in October 2021[10] and February 2022[11] had the following chemistry:

Sample Date	pH (SU)	ORP (mV)	DO (mg/L)	SEC (µS/cm)	T (ºC)	Turbidity (NTU)	Arsenic (µg/L)
Oct 2021	8.38	139	9.12	422	16.9	8	1.1
Feb 2022	7.48	---	---	441	8.6	---	<0.75

The surface water is oxic and dissolved iron would be expected to rapidly precipitate with concurrent coprecipitation and adsorption of arsenic. This process appears to be borne out with low arsenic concentrations of ≤1.1 µg/L.

[10] Eurofins. November 2021. Analytical Report, Alliant Lansing – 25220070.00, 17 pp.
[11] Eurofins. February 2022. Analytical Report, Alliant Lansing – 25220082.00, 17 pp.

Conceptual Model Summary

- Groundwater flows from the Upper Ash Pond to the north and west. Flow to the west discharges into the unnamed stream to the west. The shallow groundwater flow to the north that is not collected by the interceptor trench passes through the Former Lower Ash Pond area quarry spall before passing MW-302 and discharging to outfall channel surface water.

- Monitoring well MW-304, while not upgradient of the Ash Ponds, provides the best available background geochemistry for the site because it is hydraulically separated from ash ponds by the unnamed creek.

- Arsenic concentrations are low in background and the deeper monitoring wells downgradient of the Upper Ash Pond. The groundwater is also oxic, with 10-20 mg/L sulfate, < 0.01 mg/L iron in background shallow groundwater, and 32-91 mg/L sulfate, < 0.5 mg/L iron in deeper wells.

- Shallow groundwater immediately downgradient of the Upper Ash Pond contains on the order of 1 to 5 µg/L of arsenic, higher than background but below the GPS, approximately 20 to 50 mg/L of sulfate and 0.10 to 4 mg/L of iron.

- MW-302, which is the only monitoring well downgradient of the Former Lower Ash Pond area, has geochemistry that is unique to the site with an average of 42 µg/L of arsenic, sulfate ≤ 2.5 mg/L, 33 mg/L of iron and low ORP at -165 mV. The arsenic is not coming from the upgradient groundwater and the Upper Ash Pond. The arsenic is also not originating with the Former Lower Ash Pond. The release of the arsenic likely results from *in situ* processes in the organic-rich sediments present below the Former Lower Ash Pond area. The organic-rich sediments observed at MW-302 and the CCR closure borings support the creation of microbially-produced anoxic conditions that chemically and /or microbially reduce sulfate in the groundwater and chemically and/or microbially dissolve iron minerals such as iron oxyhydroxides, releasing iron to the groundwater and releasing arsenic that was coprecipitated with or adsorbed to the iron minerals that are in the sediment. The high iron concentration and the lack of sulfide detection in the groundwater suggests that there may be some formation of iron sulfide minerals (e.g. FeS). Iron sulfide can potentially adsorb/coprecipitate arsenic, but

there may not be enough formed to adsorb all the arsenic released from the iron mineral dissolution.

- Groundwater from MW-302 discharges to surface water in the outfall 001 channel The surface water is oxic and dissolved iron rapidly oxidizes and precipitates with concurrent coprecipitation and adsorption of arsenic.

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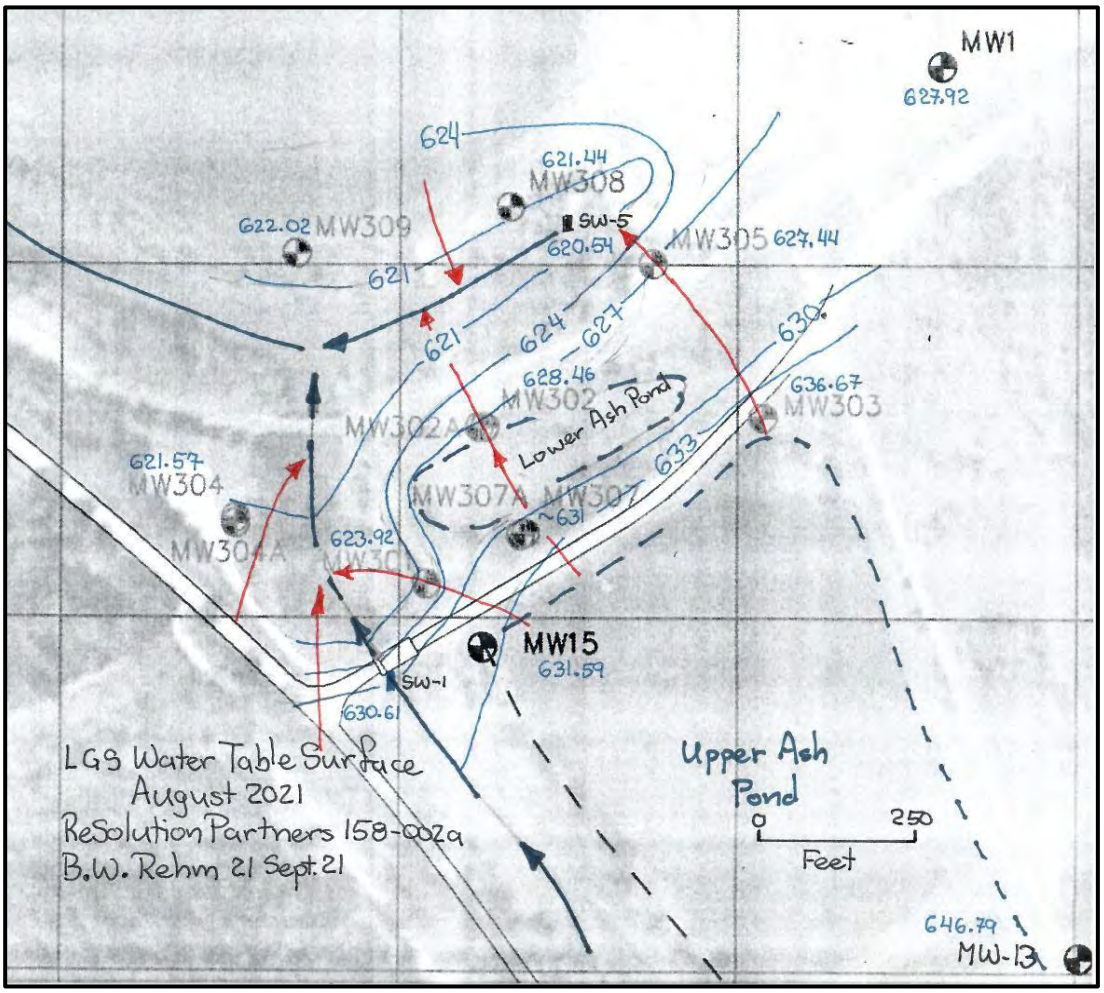
Figure 1. Site map and horizontal groundwater flow.



Notes: 1.) MW-302 yield groundwater with arsenic concentration above 10 µg/L GPS.
2.) MW-304 and -304A provide background groundwater geochemistry.
3.) Interceptor trench was located between MW-307 and the Former Lower Ash Pond and extended from near MW-301 to MW-303.

Figure 2. Groundwater flow cross-section.

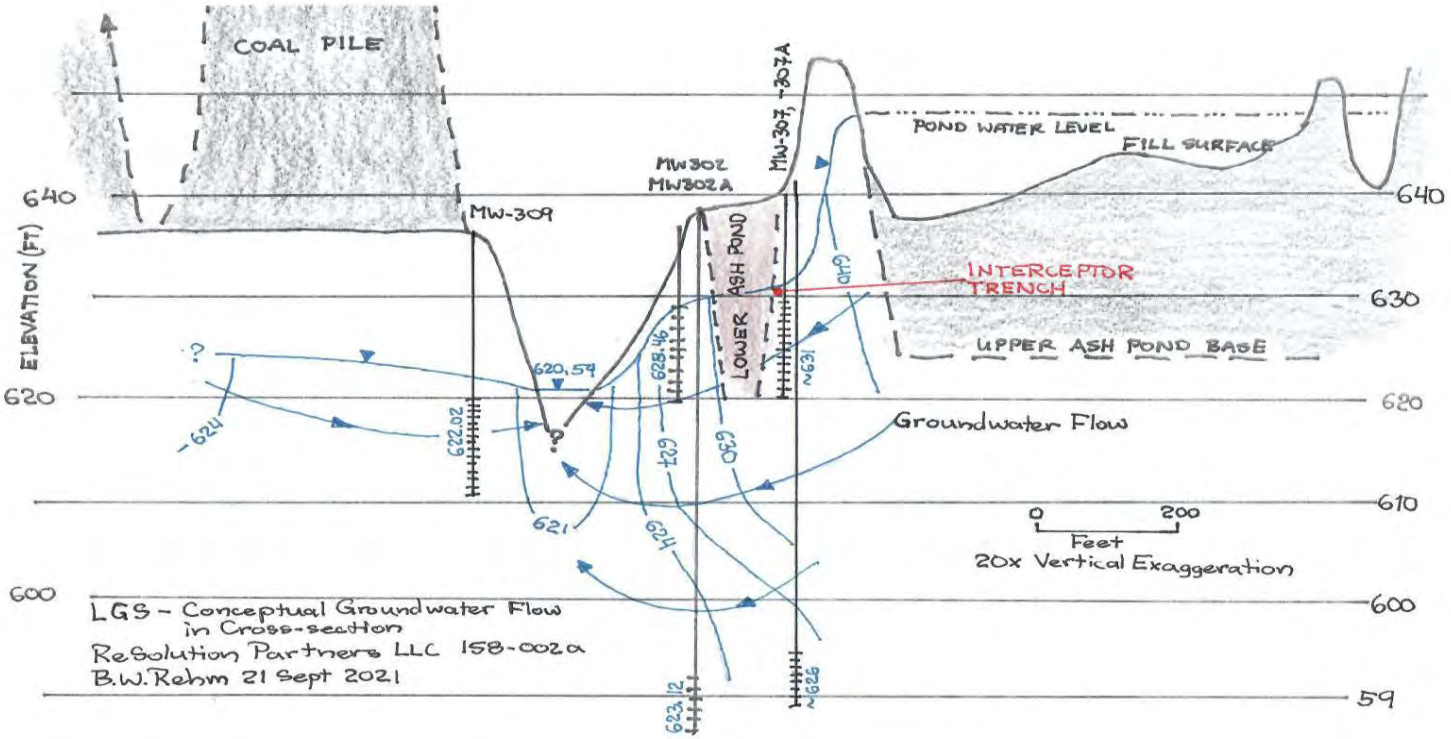


Figure 3. Arsenic concentrations as a function of oxidation-reduction potential.

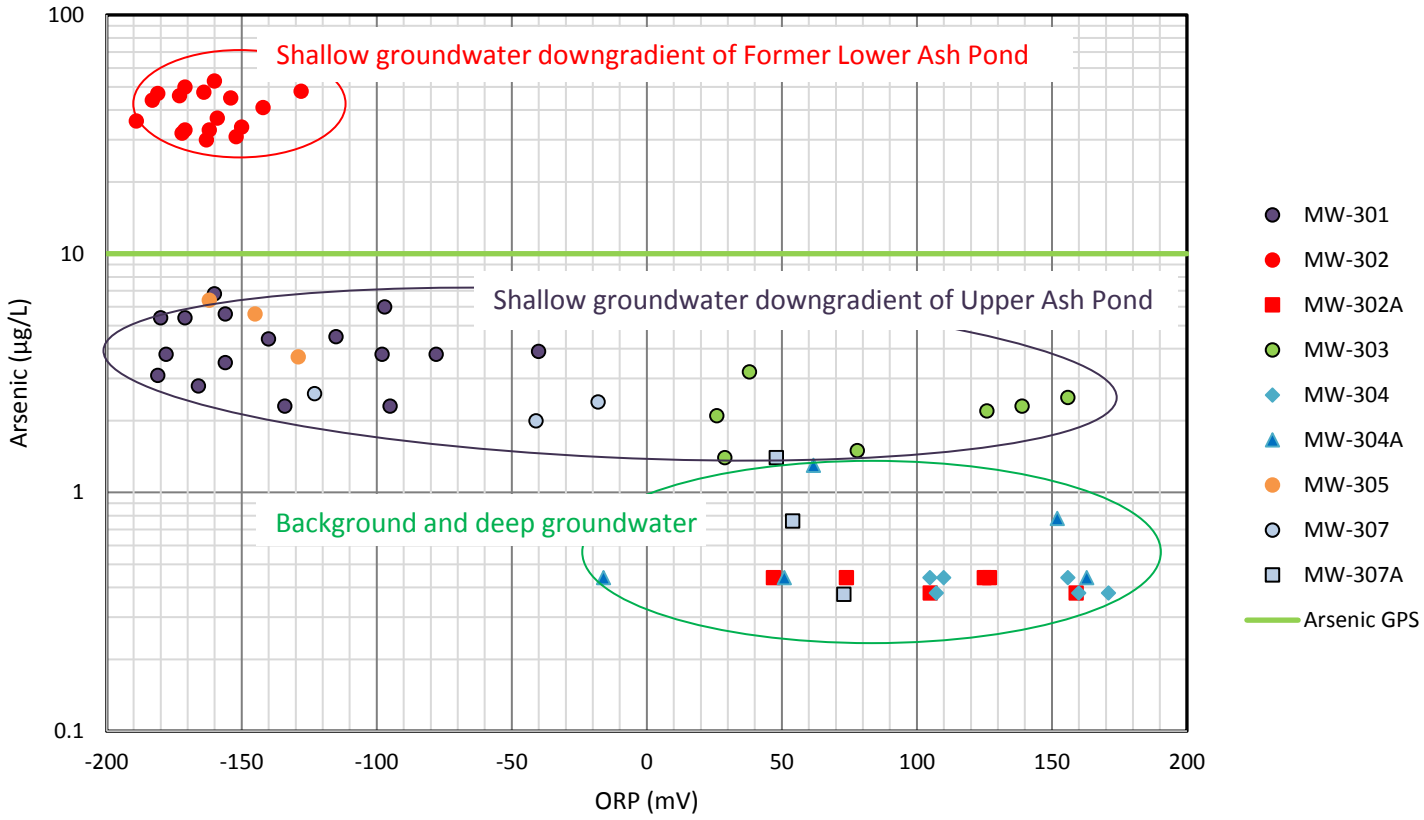


Figure 4. Arsenic concentrations over time at MW-302.

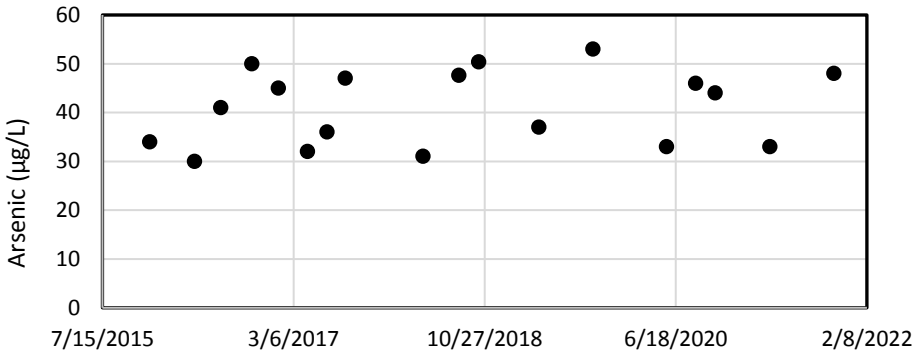


Figure 5. Correlation between arsenic, sulfate and ORP.

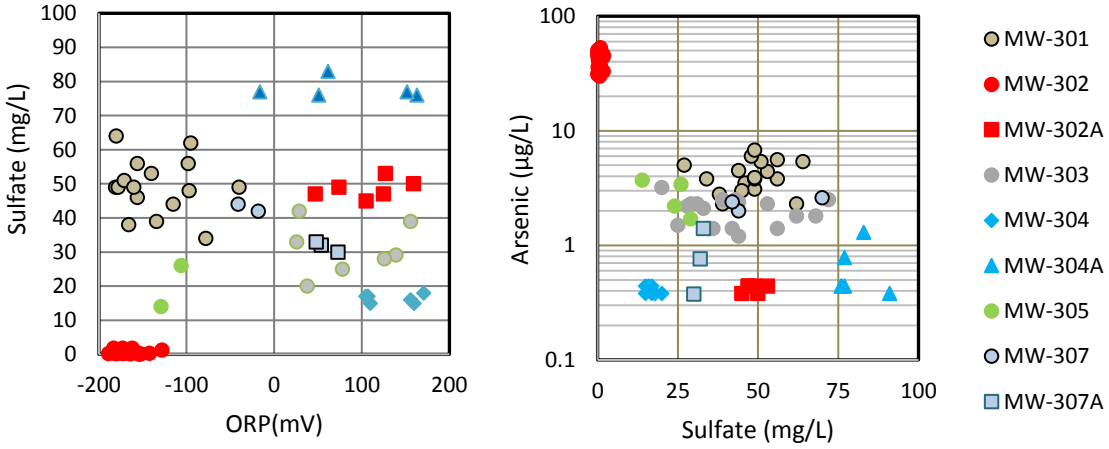


Figure 6. Correlation between arsenic, iron and ORP.

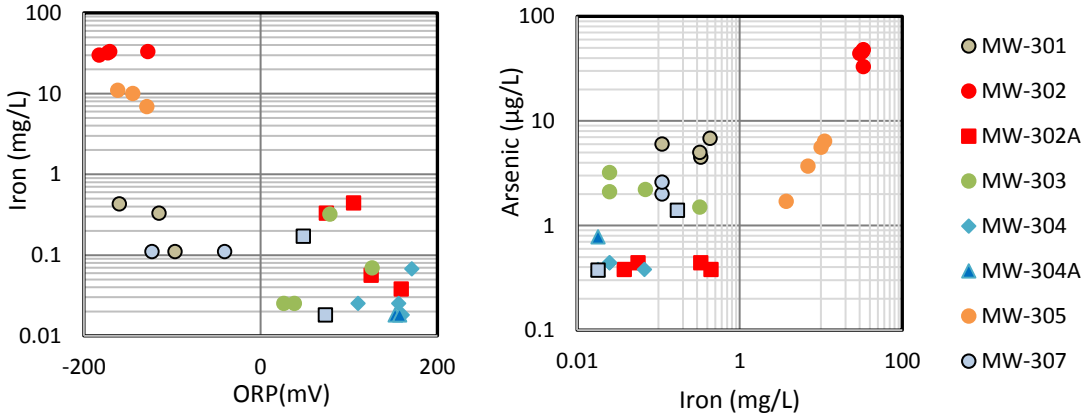


Table 1. Summary of key groundwater geochemical observations. Bold red text highlights MW-302 where arsenic concentrations exceed the GPS.

Location	pH (SU)	ORP (mV)	SEC (µS/cm)	Turbidity (NTU)	Arsenic (µg/L)	Sulfate (mg/L)	Iron (mg/L)
MW-301	8.1 (18)	-144 (18)*	480 (19)	3 (119)	4.2 (17)	48 (18)	0.30 (4)
MW-302	**7.11 (18)**	**-165 (18)***	**1,027 (19)**	**4 (17)**	**42 (17)**	**0.70 (17)**	**32 (4)**
MW-302A	7.26 (5)	96 (6)	633 (6)	3 (6)	0.42 (6)	49 (6)	0.22 (4)
MW-303	7.81 (18)	78 (16)	479 (19)	1 (18)*	2.0 (17)	44 (18)	0.11 (4)
MW-304 (Background)	7.23 (6)	135 (6)*	573 (7)	1 (6)*	0.41 (7)	17 (6)	0.034 (4)
MW-304A (Background)	7.97 (7)	87 (8)	536 (8)	118 (7)*	0.68 (6)	91 (6)	0.033 (4)
MW-305	7.13 (6)	-138 (5)*	637 (7)	12 (7)	3.8 (7)	23 (4)*	7.9 (4)
MW-307	8.07 (3)	-61 (3)	416 (3)	0 (3)	2.3 (3)	52 (3)	0.11 (2)
MW-307A	7.49 (3)	58 (3)	618 (3)	0 (3)	0.85 (3)	32 (3)	0.10 (2)

- Values in parentheses indicate the number of analyses.
- One-half of the reporting limit was used for non-detected concentrations.
- Dissolved iron concentrations were used. Dissolved and total arsenic used due to small number of dissolved arsenic results. Inspection of the data suggests the difference between dissolved and total concentrations was small.

*Indicates one or more outliers removed from the average calculation.

Attachment 1

Data Used in the Preparation of the Arsenic Evaluation

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ReSolution Partners, LLC

Final

Location ID	Collection Date	Field pH	Field SEC	Field Temperature	Oxygen, Dissolved	Turbidity	Field ORP	Arsenic	Sulfate	Iron
		SU	µmhos/cm	deg C	mg/L	NTU	mV	µg/L	mg/L	mg/L
MW-301	12/10/2015	7.96	431	13.6	1.1		-95	2.3	62	
	4/29/2016	8.23	355	8.9	0.3	2	-134	2.3	39	
	7/20/2016	7.86	377	13.3	0.2	2	-166	2.8	38	
	10/26/2016	8.10	456	15.4	0.0	7	-156	3.5	46	
	1/17/2017	8.37	491	12.3	1.6	4	-98	3.8	56	
	4/19/2017	8.50	471	10.6	0.3	3	-181	3.1	49	
	6/19/2017	8.25	468	12.2	0.0	0	-230	3.0	45	
	8/15/2017	8.19	498	14.7	0.0	5	-178	3.8	49	
	10/16/2017	7.66	497	17.0	0.0	0	-221		53	
	4/16/2018	8.39	505	9.5	1.0	8	-40	3.9	49	
	6/4/2018	8.10	507	12.2	0.9	3	-146			
	8/7/2018	8.08	524	14.6	0.2	6	-140	4.4	53	
	10/8/2018	8.16	545	17.4	0.3	9	-180	5.4	64	
	4/15/2019	8.47	539	11.3	0.2	9	-171	5.4	51	
	10/2/2019	8.11	502	15.6	0.1	1	-156	5.6	56	
	5/19/2020	7.85	474	11.3	0.8	1	-78	3.8	34	
	8/18/2020		476	15.0	0.2	2	-115	*4.5*	44	*0.33*
	10/19/2020	8.10	489	14.7	0.4	1	-97	6.0	48	*0.11*
	4/8/2021	8.04	461	11.5	0.3	0	-10*	5.0	27	*0.32*
	10/26/2021	8.11	534	16.1	0.1	1	-160	*6.8*	49	*0.43*
	Average	**8.13**	**480**	**13.4**	**0.4**	**3**	**-144**	**4.2**	**48**	**0.30**
MW-302	12/10/2015	7.15	918	12.7	0.1		-150	34	10*	
	4/29/2016	7.41	875	7.8	0.1	5	-163	30	0.7	
	7/20/2016	6.86	891	14.2	0.0	3	-142	41	0.3	
	10/26/2016	7.12	1004	15.6	0.0	11	-171	50	0.30	
	1/17/2017	7.25	1036	9.3	0.2	93*	-154	45	0.075	
	4/19/2017	7.25	971	7.6	0.0	3	-172	32	0.25	
	6/19/2017	7.03	1017	11.4	0.0	5	-189	36	0.25	
	8/15/2017	6.96	1053	15.7	0.0	4	-181	47	0.25	
	10/16/2017	7.10	1045	16.2	0.0	4	-179		0.25	
	4/16/2018	7.26	1098	6.0	0.8	5	-152	31	0.12	
	6/4/2018	6.97	1068	10.8	0.1	1	-179			
	8/7/2018	6.92	1095	15.3	0.1	11	-164	48	0.12	
	10/8/2018	6.93	1039	17.0	0.5	6	-44*	50	0.12	
	4/15/2019	7.66	1089	7.1	0.2	18	-159	37	0.90	
	10/2/2019	7.15	1049	15.9	0.1	5	-160	53	0.90	
	5/20/2020	6.93	1070	8.7	0.2	4	-162	33	1.8	

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Final

Location ID	Collection Date	Field pH	Field SEC	Field Temperature	Oxygen, Dissolved	Turbidity	Field ORP	Arsenic	Sulfate	Iron
		SU	µmhos/cm	deg C	mg/L	NTU	mV	µg/L	mg/L	mg/L
	8/19/2020		1039	16.2	0.1	4	-173	*46*	1.8	*32*
	10/19/2020	7.10	1074	14.4	0.1	3	-183	*44*	1.8	*30*
	4/9/2021	7.08	1043	7.5	0.0	3	-171	*33*	1.3	*33*
	10/27/2021	6.89	1075	15.7	1.1	3	-128	*48*	1.3	*33*
	Average	**7.11**	**1027**	**12.3**	**0.2**	**4**	**-165**	**41**	**0.70**	**32**
MW-302A	5/20/2020	7.27	644	11.7	6.6	12	127	0.44	53	
	7/6/2020	7.22	641	11.7	6.6	5	47	0.44	47	
	8/19/2020		638	11.8	6.2	0	74	*0.44*	49	*0.33*
	10/19/2020	7.40	650	11.4	6.5	1	125	0.44	47	*0.056*
	4/9/2021	7.25	597	11.0	7.9	1	105	0.38	45	*0.44*
	10/27/2021	7.15	627	12.0	7.3	0	159	*0.38*	50	*0.038*
	Average	**7.26**	**633**	**11.6**	**6.8**	**3**	**96**	**0.42**	**49**	**0.22**
MW-303	12/10/2015	8.03	375	8.5	2.4	133*	84	2.3	31	
	4/29/2016	8.07	409	6.7	2.6	2		1.4	36	
	7/20/2016	7.12	535	30.4	0.2	0		1.4	56	
	10/26/2016	7.93	776	22.1	8.1	3	10	1.8	62	
	1/17/2017	8.16	614	6.3	3.0	3	221	1.8	68	
	4/19/2017	8.19	520	10.5	1.4	0	81	2.4	44	
	6/20/2017	7.93	567	24.8	0.0	0	9	2.5	72	
	8/15/2017	7.78	423	31.7	0.0	0		2.5	43	
	10/16/2017	7.20	687	25.2	1.9	0	49		70	
	4/16/2018	8.00	552	4.1	3.5	0	53	1.2	44	
	6/4/2018	7.59	431	17.0	0.4	1	68			
	8/7/2018	7.66	425	31.5	0.4	5		2.3	53	
	10/8/2018	7.91	328	28.5	0.4	3	139	2.3	29	
	4/15/2019	7.95	448	4.2	1.4	7		1.4	35	
	10/2/2019	7.83	409	25.2	0.3	1	156	2.5	39	
	5/19/2020	7.67	464	6.3	1.3	0	29	1.4	42	
	8/18/2020		408	30.4	0.2	2	26	*2.1*	33	*0.025*
	10/19/2020	7.90	340	23.5	0.6	0	38	3.2	20	*0.025*
	4/8/2021	8.00	425	3.7	2.0	0	78	1.5	25	*0.32*
	10/26/2021	7.45	452	24.8	0.2	1	126	*2.2*	28	*0.069*
	Average	**7.81**	**479**	**18.3**	**1.5**	**1**	**78**	**2.0**	**44**	**0.11**
MW-304	6/20/2019	7.01	593	10.6	6.2	104*	41*	0.38	20	
	10/2/2019	7.16	578	12.4	7.5	4	107	0.38	17	
	5/20/2020	7.32	574	9.0	7.8	4	105	0.44	17	
	8/19/2020		583	11.8	6.8	1	110	*0.44*	15	*0.025*

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Final

Location ID	Collection Date	Field pH	Field SEC	Field Temperature	Oxygen, Dissolved	Turbidity	Field ORP	Arsenic	Sulfate	Iron
		SU	µmhos/cm	deg C	mg/L	NTU	mV	µg/L	mg/L	mg/L
	10/19/2020	7.30	602	11.8	6.8	0	156	0.44	16	*0.025*
	4/9/2021	7.27	520	8.8	8.7	0	160	0.38	15	*0.018*
	10/26/2022	7.29	562	12.1	8.3	0	171	0.38	18	*0.067*
	Average	**7.23**	**573**	**10.9**	**7.4**	**1**	**135**	**0.41**	**17**	**0.034**
MW-304A	5/20/2020	8.04	529	12.6	0.5	586*	62	1.3	83	
	7/6/2020	7.90	541	19.1	0.3	182	-16	0.44	77	
	8/19/2020		533	14.0	0.3	236	51	*0.44*	76	0.025
	10/19/2020	8.00	547	10.1	0.8	90	163	0.44	76	0.055
	2/23/2021	8.01	534	9.1	0.4	117	45			
	4/9/2021	7.78	533	10.1	0.4	165	152	0.78	77	*0.018*
	7/12/2021	8.09	543	13.8	0.5	36	80			
	10/26/2022	7.94	527	13.4	2.5	3	157	*0.38*	91	*0.018*
	Average	**7.97**	**536**	**12.8**	**0.7**	**118**	**87**	**0.68**	**80**	**0.033**
MW-305	6/20/2019	7.19	638	15.5	0.2	10	27*	2.2	24	
	10/2/2019	7.03	635	19.0	0.2	9	-106	3.4	26	
	5/19/2020	6.90	684	9.8	0.5	20	-138	3.6	1.8*	
	8/18/2020		654	19.0	0.1	27	-162	*6.4*	1.8*	11
	10/20/2020	7.20	634	15.6	0.2	4	-145	5.6	1.8*	10
	4/9/2021	7.17	574	7.1	2.1	15	-26*	1.7	29	*3.7*
	10/27/2021	7.29	643	16.3	0.1	0	-129	*3.7*	14	*6.9*
	Average	**7.13**	**637**	**14.6**	**0.5**	**12**	**-138**	**3.8**	**23**	**7.9**
MW-307	7/12/2021	8.25	450	15.2	0.5	0	-41	*2.0*	44	*0.11*
	8/12/2021	7.86	437	17.4	0.2	0	-18	2.4	42	
	10/27/2021	8.11	361	16.4	0.9	0	-123	*2.6*	70	*0.11*
	Average	**8.07**	**416**	**16.3**	**0.5**	**0**	**-61**	**2.3**	**52**	**0.11**
MW-307A	7/12/2021	7.83	616	13.2	0.3	0	73	*0.38*	30	*0.02*
	8/12/2021	7.35	612	12.5	0.2	0	54	0.76	32	
	10/27/2021	7.29	625	12.9	1.4	0	48	*1.4*	33	*0.17*
	Average	**7.49**	**618**	**12.9**	**0.6**	**0**	**58**	**0.85**	**32**	**0.10**

NOTES: * not included in average or charts *Italic = dissolved concentration*

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Appendix D

Analytical Results – Total Organic Carbon and Outfall Sample

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ANALYTICAL REPORT

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park, IL 60484
Tel: (708)534-5200

Laboratory Job ID: 500-189355-1
Client Project/Site: IPL - Lansing - 25220082

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Mr. Tom Karwoski

Authorized for release by:
10/22/2020 12:41:16 PM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

Table of Contents

Case Narrative

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Job ID: 500-189355-1

Laboratory: Eurofins TestAmerica, Chicago

Narrative

Job Narrative
500-189355-1

Comments
No additional comments.

Receipt
The samples were received on 10/14/2020 10:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 14.8º C.

Receipt Exceptions
The following sample(s) was received at the laboratory outside the required temperature criteria. There was no cooling media present in the cooler. Receiving cooler temp: 14.8°C.

The following sample(s) was received outside of holding time for TOC analysis.

General Chemistry
Method Lloyd Kahn: The following samples were analyzed outside of analytical holding time due to the lab receiving the samples after the hold time was expired. LAN MW-302A, 9-11' (500-189355-1), LAN MW-302A, 11-13' (500-189355-2), LAN MW-302A, 18-20' (500-189355-3) and LAN MW-302A, 22-25' (500-189355-4).

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

Detection Summary

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Client Sample ID: LAN MW-302A, 9-11' — Lab Sample ID: 500-189355-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	19000	H H3	1000	670	mg/Kg	1		Lloyd Kahn	Total/NA

Client Sample ID: LAN MW-302A, 11-13' — Lab Sample ID: 500-189355-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	16000	H H3	1000	670	mg/Kg	1		Lloyd Kahn	Total/NA

Client Sample ID: LAN MW-302A, 18-20' — Lab Sample ID: 500-189355-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	18000	H H3	1000	670	mg/Kg	1		Lloyd Kahn	Total/NA

Client Sample ID: LAN MW-302A, 22-25' — Lab Sample ID: 500-189355-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	67000	H H3	1000	670	mg/Kg	1		Lloyd Kahn	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Method	Method Description	Protocol	Laboratory
Lloyd Kahn	Organic Carbon, Total (TOC)	EPA	TAL BUR

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
500-189355-1	LAN MW-302A, 9-11'	Solid	12/18/19 00:00	10/14/20 10:00	
500-189355-2	LAN MW-302A, 11-13'	Solid	12/18/19 00:00	10/14/20 10:00	
500-189355-3	LAN MW-302A, 18-20'	Solid	12/18/19 00:00	10/14/20 10:00	
500-189355-4	LAN MW-302A, 22-25'	Solid	12/18/19 00:00	10/14/20 10:00	

Client Sample Results

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Client Sample ID: LAN MW-302A, 9-11'
Date Collected: 12/18/19 00:00
Date Received: 10/14/20 10:00

Lab Sample ID: 500-189355-1
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	19000	H H3	1000	670	mg/Kg			10/19/20 17:30	1

Client Sample Results

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Client Sample ID: LAN MW-302A, 11-13'

Date Collected: 12/18/19 00:00
Date Received: 10/14/20 10:00

Lab Sample ID: 500-189355-2

Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	16000	H H3	1000	670	mg/Kg			10/19/20 17:34	1

Client Sample Results

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Client Sample ID: LAN MW-302A, 18-20'

Lab Sample ID: 500-189355-3

Date Collected: 12/18/19 00:00

Matrix: Solid

Date Received: 10/14/20 10:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	18000	H H3	1000	670	mg/Kg			10/19/20 17:38	1

Client Sample Results

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Client Sample ID: LAN MW-302A, 22-25'

Lab Sample ID: 500-189355-4

Date Collected: 12/18/19 00:00
Matrix: Solid
Date Received: 10/14/20 10:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	67000	H H3	1000	670	mg/Kg			10/19/20 18:03	1

Definitions/Glossary

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
H3	Sample was received and analyzed past holding time.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Association Summary

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

General Chemistry

Analysis Batch: 160186

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
500-189355-1	LAN MW-302A, 9-11'	Total/NA	Solid	Lloyd Kahn	
500-189355-2	LAN MW-302A, 11-13'	Total/NA	Solid	Lloyd Kahn	
500-189355-3	LAN MW-302A, 18-20'	Total/NA	Solid	Lloyd Kahn	
500-189355-4	LAN MW-302A, 22-25'	Total/NA	Solid	Lloyd Kahn	
MB 200-160186/5	Method Blank	Total/NA	Solid	Lloyd Kahn	
LCS 200-160186/6	Lab Control Sample	Total/NA	Solid	Lloyd Kahn	

QC Sample Results

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Method: Lloyd Kahn - Organic Carbon, Total (TOC)

Lab Sample ID: MB 200-160186/5
Matrix: Solid
Analysis Batch: 160186

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	<670		1000	670	mg/Kg			10/19/20 16:46	1

Lab Sample ID: LCS 200-160186/6
Matrix: Solid
Analysis Batch: 160186

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon			8300	8960		mg/Kg		108	75 - 125		

Lab Chronicle

Client: SCS Engineers
Project/Site: IPL - Lansing - 25220082

Job ID: 500-189355-1

Client Sample ID: LAN MW-302A, 9-11'
Lab Sample ID: 500-189355-1
Date Collected: 12/18/19 00:00
Matrix: Solid
Date Received: 10/14/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	160186	10/19/20 17:30	RWM	TAL BUR

Client Sample ID: LAN MW-302A, 11-13'
Lab Sample ID: 500-189355-2
Date Collected: 12/18/19 00:00
Matrix: Solid
Date Received: 10/14/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	160186	10/19/20 17:34	RWM	TAL BUR

Client Sample ID: LAN MW-302A, 18-20'
Lab Sample ID: 500-189355-3
Date Collected: 12/18/19 00:00
Matrix: Solid
Date Received: 10/14/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	160186	10/19/20 17:38	RWM	TAL BUR

Client Sample ID: LAN MW-302A, 22-25'
Lab Sample ID: 500-189355-4
Date Collected: 12/18/19 00:00
Matrix: Solid
Date Received: 10/14/20 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Lloyd Kahn		1	160186	10/19/20 18:03	RWM	TAL BUR

Laboratory References:

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 500-189355-1
Project/Site: IPL - Lansing - 25220082

Laboratory: Eurofins TestAmerica, Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2336	02-25-23
Connecticut	State	PH-0751	09-30-21
DE Haz. Subst. Cleanup Act (HSCA)	State	N/A	05-16-21
Florida	NELAP	E87467	06-30-21
Minnesota	NELAP	050-999-436	12-31-20
New Hampshire	NELAP	2006	12-18-20
New Jersey	NELAP	VT972	06-30-21
New York	NELAP	10391	04-01-21
Pennsylvania	NELAP	68-00489	04-30-21
Rhode Island	State	LAO00298	12-30-20
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00272	08-09-20 *
Vermont	State	VT4000	12-31-20
Virginia	NELAP	460209	12-14-20
Wisconsin	State	399133350	08-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

393604

eurofins | Environment Testing TestAmerica

Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager: Tom Karwoski	Site Contact:	Date:	COC No:
Company Name: SCS Engineers	Tel/Email: tkarwoski@scsengineers.com	Lab Contact:	Carrier:	_____ of _____ COCs
Address: 2830 Dairy Dr	Analysis Turnaround Time			Sampler:
City/State/Zip: Madison WI 53718	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: tkarwoski@scsengineers.com	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: IPL-LANSING #25220082	☐ 1 week			
Site: LANSING	☐ 2 days			Job / SDG No.:
PO# 25220082	☐ 1 day			500-189355

500-189355 COC

	Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	total organic content	Sample Specific Notes:
1	LAN MW-302A, 9-11'	12/8/19		G	S	2			X	
2	LAN MW-302A, 11-13'								X	
3	LAN MW-302A, 18-20'								X	
4	LAN MW-302A, 22-25'								X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

14.8

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ | Therm ID No.:_____

Relinquished by:	Company: SCS	Date/Time: 10/13/20	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Stephanie Hemandez	Company: TA-CHI	Date/Time: 10/14/20 1000

ORIGIN ID:RRLA (262) 202-5955
ERIC OELKERS

2830 DAIRY DR

MADISON, WI 53718
UNITED STATES US

SHIP DATE: 30MAY18
ACTWGT: 25.00 LB MAN
CAD: 525155/CAFE3208

TO

TESTAMERICA CHICAGO
2417 BOND STREET

500-189355 Wayb

UNIVERSITY PARK IL 60484-3101

(708) 534-6200 REF:
INV:
PO: DEPT:

RMA:

FedEx Express

FedEx
TRK# 0221 7125 4938 0746

WED - 14 OCT AA
PRIORITY OVERNIGHT

79 JOTA

28 qt.

60484
IL-US
ORD

FID 3911467 130CT20 MSNA 56DC2/A27E/05A2

Eurofins TestAmerica, Chicago
2417 Bond Street
University Park, IL 60484
Phone: 708-534-5200 Fax: 708-534-5211

Chain of Custody Record

500-189355 Chain of Custody

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	COC No: 500-140933.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: sandra.fredrick@eurofinset.com	State of Origin: Wisconsin	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Wisconsin	Job #: 500-189355-1
Address: 30 Community Drive, Suite 11,	Due Date Requested: 10/26/2020		
City: South Burlington	TAT Requested (days):		
State, Zip: VT, 05403			
Phone: 802-660-1990(Tel) 802-660-1919(Fax)	PO #:		
Email:	WO #:		
Project Name: SCS: General Analyses	Project #: 50006561		
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)	Lloyd_Kahn/ Organic Carbon, Total (TOC)	Special Instructions/Note:
LAN MW-302A, 9-11' (500-189355-1)	12/18/19	Central		Solid	X	
LAN MW-302A, 11-13' (500-189355-2)	12/18/19	Central		Solid	X	
LAN MW-302A, 18-20' (500-189355-3)	12/18/19	Central		Solid	X	
LAN MW-302A, 22-25' (500-189355-4)	12/18/19	Central		Solid	X	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

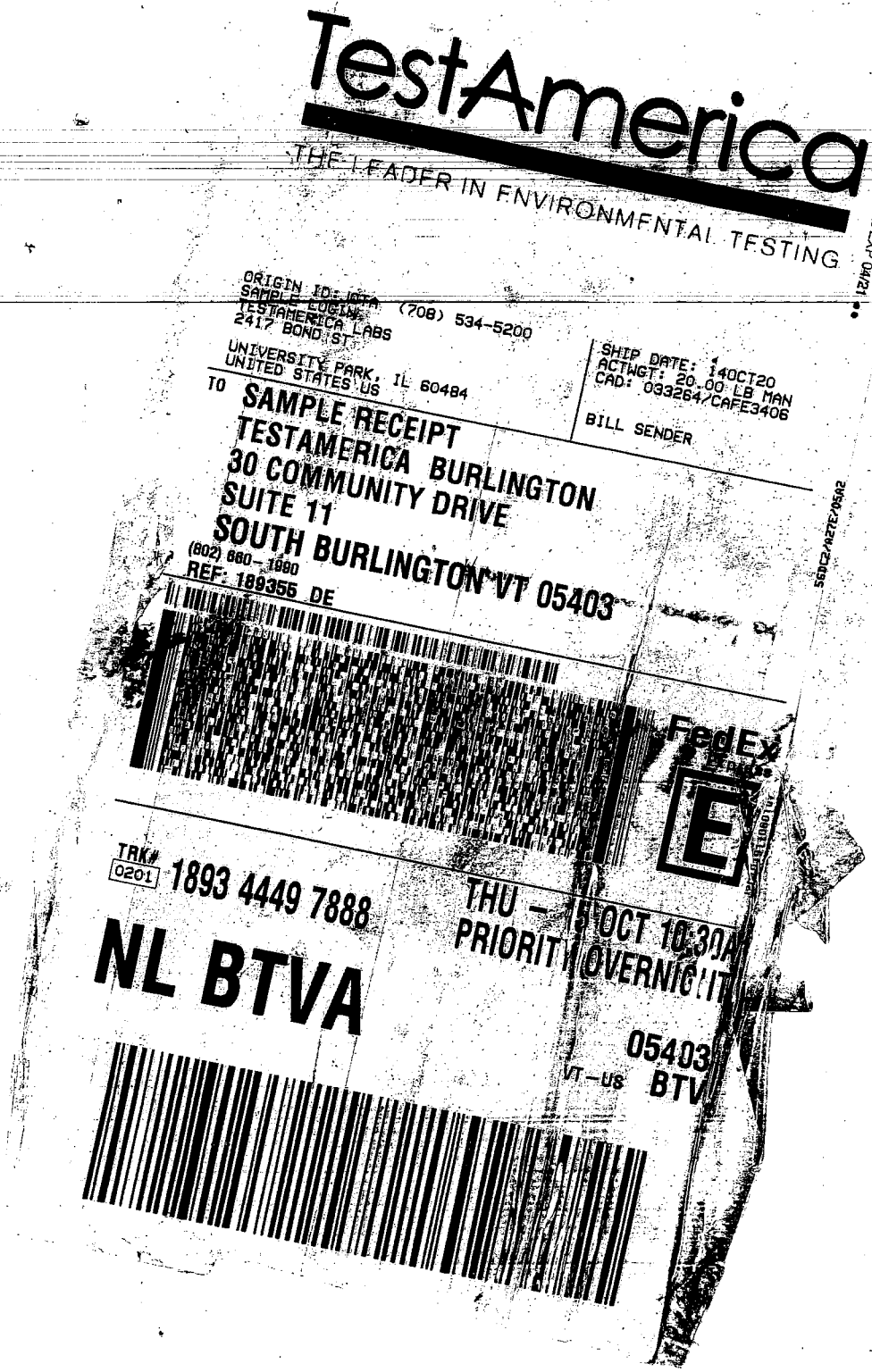
Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	10/14/20 1600	TA			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			[signature]	10/15/20 1040	EDA Bur

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019


TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
ORIGIN ID: IGTA
SAMPLE LOGIN
TESTAMERICA LABS
2417 BOND ST
UNIVERSITY PARK, IL 60484
UNITED STATES US
(708) 534-5200
SHIP DATE: 14OCT20
ACTWGT: 20.00 LB MAN
CAD: 033264/CAFE3406
BILL SENDER
TO SAMPLE RECEIPT
TESTAMERICA BURLINGTON
30 COMMUNITY DRIVE
SUITE 11
SOUTH BURLINGTON VT 05403
(802) 660-1990
REF: 189355 DE
FedEx
TRK# 0201 1893 4449 7888
THU - 15 OCT 10:30A
PRIORITY OVERNIGHT
NL BTVA
05403
VT-US BTV
Part # 159469-434 RIT2 EXP 04/21

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 500-189355-1

Login Number: 189355
List Number: 1
Creator: Hernandez, Stephanie

List Source: Eurofins TestAmerica, Chicago

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.	False	Geotech only
Cooler Temperature is acceptable.	False	Geotech only
Cooler Temperature is recorded.	True	14.8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 500-189355-1

Login Number: 189355
List Number: 2
Creator: Jaffe, Nat S

List Source: Eurofins TestAmerica, Burlington
List Creation: 10/15/20 02:27 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	1346840
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.3ºC
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
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.	N/A	
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 TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-184204-1
Laboratory Sample Delivery Group: Project #50886
Client Project/Site: Lansing NPDES Permit Renewal 2020

For:
Alliant Energy Corporation
2320 Power Plant Drive
Lansing, Iowa 52151

Attn: Glen Thomas

Authorized for release by:
6/30/2020 9:06:34 AM

Brian Graettinger, Client Service Manager
(319)595-2012
brian.graettinger@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Case Narrative

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Job ID: 310-184204-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-184204-1

Comments
No additional comments.

Receipt
The samples were received on 6/17/2020 12:45 PM; the samples arrived in on ice on the day of sampling. The temperatures of the 2 coolers at receipt time were 5.5º C and 12.0º C.

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

GC/MS Semi VOA
Method 625.1: The continuing calibration verification (CCV) associated with batch 310-283009 recovered above the upper control limit for 4-Nitrophenol (134%R). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

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

HPLC/IC
Methods 300.0, 9056A: The following samples were diluted due to the nature of the sample matrix: 002 Composite (310-184204-2), 001 Composite (310-184204-4) and Mississippi River Intake (310-184204-5). Elevated reporting limits (RLs) are provided.

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

Metals
Methods 245.1, 245.2, 7470A: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 310-282539 and analytical batch 310-282725 recovered outside control limits for the following analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

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

General Chemistry
Method 1664A: Constant weight was not achieved after 3 drying cycles for the following sample: (190-23310-A-2-A).

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

Biology
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

Sample Summary

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-184204-1	002 Grab	Wastewater	06/17/20 08:00	06/17/20 12:45	
310-184204-2	002 Composite	Wastewater	06/17/20 08:00	06/17/20 12:45	
310-184204-3	001 Grab	Wastewater	06/17/20 08:00	06/17/20 12:45	
310-184204-4	001 Composite	Wastewater	06/17/20 08:00	06/17/20 12:45	
310-184204-5	Mississippi River Intake	Wastewater	06/17/20 08:00	06/17/20 12:45	

Client Sample Results

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Client Sample ID: 002 Grab

Date Collected: 06/17/20 08:00
Date Received: 06/17/20 12:45

Lab Sample ID: 310-184204-1

Matrix: Wastewater

Method: 624.1 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
1,1,1-Trichloroethane	<0.000190		0.00100	0.000190	mg/L		06/22/20 12:48	1	SJN
1,1,2,2-Tetrachloroethane	<0.000470		0.00100	0.000470	mg/L		06/23/20 10:41	1	SJN
1,1,2-Trichloroethane	<0.000450		0.00100	0.000450	mg/L		06/22/20 12:48	1	SJN
1,1-Dichloroethane	<0.000220		0.00100	0.000220	mg/L		06/22/20 12:48	1	SJN
1,1-Dichloroethylene	<0.000560		0.00200	0.000560	mg/L		06/22/20 12:48	1	SJN
1,2-Dichloroethane	<0.000390		0.00100	0.000390	mg/L		06/22/20 12:48	1	SJN
1,2-Dichloropropane	<0.000270		0.00100	0.000270	mg/L		06/22/20 12:48	1	SJN
1,2-trans-Dichloroethylene	<0.000270		0.00100	0.000270	mg/L		06/22/20 12:48	1	SJN
1,3-Dichloropropylene	<0.000560		0.00500	0.000560	mg/L		06/22/20 12:48	1	SJN
2-Chloroethyl vinyl ether	<0.00170		0.00200	0.00170	mg/L		06/22/20 12:48	1	SJN
Acrolein	<0.00360		0.0100	0.00360	mg/L		06/22/20 12:48	1	SJN
Acrylonitrile	<0.00220		0.00500	0.00220	mg/L		06/22/20 12:48	1	SJN
Benzene	<0.000220		0.000500	0.000220	mg/L		06/22/20 12:48	1	SJN
Bromoform	<0.000780		0.00500	0.000780	mg/L		06/22/20 12:48	1	SJN
Carbon tetrachloride	<0.000650		0.00200	0.000650	mg/L		06/22/20 12:48	1	SJN
Chlorobenzene	<0.000400		0.00100	0.000400	mg/L		06/22/20 12:48	1	SJN
Chlorodibromomethane	<0.000750		0.00500	0.000750	mg/L		06/22/20 12:48	1	SJN
Chloroethane	<0.000790		0.00400	0.000790	mg/L		06/22/20 12:48	1	SJN
Chloroform	<0.00130		0.00300	0.00130	mg/L		06/22/20 12:48	1	SJN
Dichlorobromomethane	<0.000390		0.00100	0.000390	mg/L		06/22/20 12:48	1	SJN
Ethylbenzene	<0.000310		0.00100	0.000310	mg/L		06/22/20 12:48	1	SJN
Methyl bromide	<0.00110		0.00400	0.00110	mg/L		06/23/20 10:41	1	SJN
Methyl chloride	<0.000610		0.00300	0.000610	mg/L		06/22/20 12:48	1	SJN
Methylene Chloride	<0.00170		0.00500	0.00170	mg/L		06/22/20 12:48	1	SJN
Tetrachloroethene	<0.000480		0.00100	0.000480	mg/L		06/22/20 12:48	1	SJN
Toluene	<0.000430		0.00100	0.000430	mg/L		06/22/20 12:48	1	SJN
Trichloroethylene	<0.000430		0.00100	0.000430	mg/L		06/22/20 12:48	1	SJN
Vinyl chloride	<0.000180		0.00100	0.000180	mg/L		06/22/20 12:48	1	SJN

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Analyzed*	*Dil Fac*	*Analyst*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*	*06/22/20 12:48*	*1*	*SJN*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*	*06/23/20 10:41*	*1*	*SJN*
Dibromofluoromethane (Surr)	*103*		*80 - 120*	*06/22/20 12:48*	*1*	*SJN*
Dibromofluoromethane (Surr)	*97*		*80 - 120*	*06/23/20 10:41*	*1*	*SJN*
Toluene-d8 (Surr)	*99*		*80 - 120*	*06/22/20 12:48*	*1*	*SJN*
Toluene-d8 (Surr)	*97*		*80 - 120*	*06/23/20 10:41*	*1*	*SJN*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Cyanide, Total	<0.00500		0.0100	0.00500	mg/L		06/19/20 21:02	1	JMH
Phenols, Total	<0.0138		0.0184	0.0138	mg/L		06/18/20 16:36	1	JMH
Biochemical Oxygen Demand	**5.60**		3.00	1.41	mg/L		06/18/20 11:32	1	CJG

Method: 9223B - E. Coli, Most Probable Number

Analyte	Result	Qualifier	RL	RL	Unit	D	Analyzed	Dil Fac	Analyst
E. Coli	**15**		1.0	1.0	MPN/100mL		06/17/20 13:35	1	LBB

Client Sample Results

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Client Sample ID: 002 Composite

Date Collected: 06/17/20 08:00
Date Received: 06/17/20 12:45

Lab Sample ID: 310-184204-2

Matrix: Wastewater

Method: 625.1 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
2,4,6-Trichlorophenol	<0.00125		0.0104	0.00125	mg/L		06/23/20 18:07	1	DMD
2,4-Dichlorophenol	<0.00115		0.0104	0.00115	mg/L		06/23/20 18:07	1	DMD
2,4-Dimethylphenol	<0.00104		0.0104	0.00104	mg/L		06/23/20 18:07	1	DMD
2,4-Dinitrophenol	<0.00594		0.0208	0.00594	mg/L		06/23/20 18:07	1	DMD
2-Chlorophenol	<0.00115		0.0104	0.00115	mg/L		06/23/20 18:07	1	DMD
2-Nitrophenol	<0.00167		0.0104	0.00167	mg/L		06/23/20 18:07	1	DMD
4,6-Dinitro-o-cresol	<0.00260		0.0104	0.00260	mg/L		06/23/20 18:07	1	DMD
4-Nitrophenol	<0.00260		0.0104	0.00260	mg/L		06/23/20 18:07	1	DMD
p-Chloro-m-cresol	<0.000990		0.0104	0.000990	mg/L		06/23/20 18:07	1	DMD
Pentachlorophenol	<0.00240		0.0104	0.00240	mg/L		06/23/20 18:07	1	DMD
Phenol	<0.00250		0.0104	0.00250	mg/L		06/23/20 18:07	1	DMD

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Analyzed*	*Dil Fac*	*Analyst*
2,4,6-Tribromophenol (SUR)	*59*		*23 - 110*	*06/23/20 18:07*	*1*	*DMD*
2-Fluorobiphenyl (Surr)	*54*		*26 - 110*	*06/23/20 18:07*	*1*	*DMD*
2-Fluorophenol (Surr)	*33*		*10 - 110*	*06/23/20 18:07*	*1*	*DMD*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Bromide	<0.125		0.500	0.125	mg/L		06/18/20 19:45	5	ACJ
Chloride	**15.1**		5.00	2.00	mg/L		06/18/20 19:45	5	ACJ
Sulfate	**52.4**		5.00	3.55	mg/L		06/18/20 19:45	5	ACJ

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Aluminum	**0.393**		0.0500	0.0120	mg/L		06/19/20 13:08	1	ACJ
Antimony	<0.000510		0.00100	0.000510	mg/L		06/19/20 13:08	1	ACJ
Arsenic	**0.00233**		0.00200	0.000880	mg/L		06/19/20 13:08	1	ACJ
Barium	**0.159**		0.00200	0.000280	mg/L		06/19/20 13:08	1	ACJ
Beryllium	<0.000270		0.00100	0.000270	mg/L		06/19/20 13:08	1	ACJ
Boron	**0.167**		0.100	0.0800	mg/L		06/19/20 13:08	1	ACJ
Cadmium	<0.0000490		0.000100	0.0000490	mg/L		06/19/20 13:08	1	ACJ
Chromium	**0.00318**	**J**	0.00500	0.00110	mg/L		06/19/20 13:08	1	ACJ
Cobalt	**0.000177**	**J**	0.000500	0.0000910	mg/L		06/19/20 13:08	1	ACJ
Copper	**0.00200**	**J**	0.00500	0.00150	mg/L		06/19/20 13:08	1	ACJ
Iron	**0.0582**	**J**	0.100	0.0500	mg/L		06/19/20 13:08	1	ACJ
Lead	**0.000185**	**J**	0.000500	0.000110	mg/L		06/19/20 13:08	1	ACJ
Magnesium	**21.3**		0.500	0.100	mg/L		06/19/20 13:08	1	ACJ
Manganese	**0.0256**		0.0100	0.00400	mg/L		06/19/20 13:08	1	ACJ
Molybdenum	**0.00520**		0.00200	0.00110	mg/L		06/19/20 13:08	1	ACJ
Nickel	<0.00190		0.00500	0.00190	mg/L		06/19/20 13:08	1	ACJ
Selenium	**0.00240**	**J**	0.00500	0.00100	mg/L		06/19/20 13:08	1	ACJ
Silver	<0.000370		0.00100	0.000370	mg/L		06/19/20 13:08	1	ACJ
Thallium	<0.000260		0.00100	0.000260	mg/L		06/19/20 13:08	1	ACJ
Tin	<0.00240		0.00500	0.00240	mg/L		06/19/20 13:08	1	ACJ
Titanium	**0.00517**	**J**	0.0100	0.00170	mg/L		06/19/20 13:08	1	ACJ
Zinc	<0.0100		0.0200	0.0100	mg/L		06/19/20 13:08	1	ACJ

Client Sample ID: 002 Composite

Lab Sample ID: 310-184204-2
Date Collected: 06/17/20 08:00
Matrix: Wastewater
Date Received: 06/17/20 12:45

Method: 245.2 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.000100	*	0.000200	0.000100	mg/L		06/19/20 16:25	1	HIS

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Ammonia	<0.200		0.500	0.200	mg/L		06/25/20 22:33	1	JMH
Total Kjeldahl Nitrogen	**1.33**		1.00	0.410	mg/L		06/23/20 19:18	1	JMH
Nitrate Nitrite as N	**0.905**		0.100	0.0630	mg/L		06/23/20 17:52	1	JMH
Total Phosphorus as P	**0.0971**	**J**	0.100	0.0390	mg/L		06/18/20 20:11	1	JMH
TOC Dup	**5.37**		1.00	0.470	mg/L		06/22/20 03:34	1	JJB
Sulfide	**2.18**		2.00	1.30	mg/L		06/18/20 10:48	1	LBB
Sulfite	<1.50	HF	3.00	1.50	mg/L		06/17/20 21:53	1	JMH
Chemical Oxygen Demand	**60.4**		25.0	24.0	mg/L		06/22/20 09:41	5	WJF
Methylene Blue Active Substances	**0.0490**		0.0250	0.0130	mg/l LAS MW 340		06/18/20 11:45	1	CSS

Analyte	Result	Qualifier	RL	RL	Unit	D	Analyzed	Dil Fac	Analyst
Nitrogen, Organic	**1.33**		1.00	1.00	mg/L		06/18/20 12:53	1	LBB

Client Sample ID: 001 Grab

Lab Sample ID: 310-184204-3
Date Collected: 06/17/20 08:00
Matrix: Wastewater
Date Received: 06/17/20 12:45

Method: 624.1 - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
1,1,1-Trichloroethane	<0.000190		0.00100	0.000190	mg/L		06/22/20 13:16	1	SJN
1,1,2,2-Tetrachloroethane	<0.000470		0.00100	0.000470	mg/L		06/23/20 10:19	1	SJN
1,1,2-Trichloroethane	<0.000450		0.00100	0.000450	mg/L		06/22/20 13:16	1	SJN
1,1-Dichloroethane	<0.000220		0.00100	0.000220	mg/L		06/22/20 13:16	1	SJN
1,1-Dichloroethylene	<0.000560		0.00200	0.000560	mg/L		06/22/20 13:16	1	SJN
1,2-Dichloroethane	<0.000390		0.00100	0.000390	mg/L		06/22/20 13:16	1	SJN
1,2-Dichloropropane	<0.000270		0.00100	0.000270	mg/L		06/22/20 13:16	1	SJN
1,2-trans-Dichloroethylene	<0.000270		0.00100	0.000270	mg/L		06/22/20 13:16	1	SJN
1,3-Dichloropropylene	<0.000560		0.00500	0.000560	mg/L		06/22/20 13:16	1	SJN
2-Chloroethyl vinyl ether	<0.00170		0.00200	0.00170	mg/L		06/22/20 13:16	1	SJN
Acrolein	<0.00360		0.0100	0.00360	mg/L		06/22/20 13:16	1	SJN
Acrylonitrile	<0.00220		0.00500	0.00220	mg/L		06/22/20 13:16	1	SJN
Benzene	<0.000220		0.000500	0.000220	mg/L		06/22/20 13:16	1	SJN
Bromoform	<0.000780		0.00500	0.000780	mg/L		06/22/20 13:16	1	SJN
Carbon tetrachloride	<0.000650		0.00200	0.000650	mg/L		06/22/20 13:16	1	SJN
Chlorobenzene	<0.000400		0.00100	0.000400	mg/L		06/22/20 13:16	1	SJN
Chlorodibromomethane	<0.000750		0.00500	0.000750	mg/L		06/22/20 13:16	1	SJN
Chloroethane	<0.000790		0.00400	0.000790	mg/L		06/22/20 13:16	1	SJN
Chloroform	<0.00130		0.00300	0.00130	mg/L		06/22/20 13:16	1	SJN
Dichlorobromomethane	<0.000390		0.00100	0.000390	mg/L		06/22/20 13:16	1	SJN
Ethylbenzene	<0.000310		0.00100	0.000310	mg/L		06/22/20 13:16	1	SJN
Methyl bromide	<0.00110		0.00400	0.00110	mg/L		06/23/20 10:19	1	SJN
Methyl chloride	<0.000610		0.00300	0.000610	mg/L		06/22/20 13:16	1	SJN
Methylene Chloride	<0.00170		0.00500	0.00170	mg/L		06/22/20 13:16	1	SJN
Tetrachloroethene	<0.000480		0.00100	0.000480	mg/L		06/22/20 13:16	1	SJN
Toluene	<0.000430		0.00100	0.000430	mg/L		06/22/20 13:16	1	SJN
Trichloroethylene	<0.000430		0.00100	0.000430	mg/L		06/22/20 13:16	1	SJN

Client Sample ID: 001 Grab

Lab Sample ID: 310-184204-3
Matrix: Wastewater
Date Collected: 06/17/20 08:00
Date Received: 06/17/20 12:45

Method: 624.1 - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Vinyl chloride	<0.000180		0.00100	0.000180	mg/L		06/22/20 13:16	1	SJN

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Analyzed*	*Dil Fac*	*Analyst*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*	*06/22/20 13:16*	*1*	*SJN*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*	*06/23/20 10:19*	*1*	*SJN*
Dibromofluoromethane (Surr)	*98*		*80 - 120*	*06/22/20 13:16*	*1*	*SJN*
Dibromofluoromethane (Surr)	*95*		*80 - 120*	*06/23/20 10:19*	*1*	*SJN*
Toluene-d8 (Surr)	*98*		*80 - 120*	*06/22/20 13:16*	*1*	*SJN*
Toluene-d8 (Surr)	*100*		*80 - 120*	*06/23/20 10:19*	*1*	*SJN*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
HEM (Oil & Grease)	<4.3		4.8	4.3	mg/L		06/25/20 15:03	1	JSH
Cyanide, Total	<0.00500		0.0100	0.00500	mg/L		06/19/20 21:02	1	JMH
Phenols, Total	<0.0150		0.0200	0.0150	mg/L		06/18/20 16:35	1	JMH
Total Suspended Solids	**21.0**		15.0	5.10	mg/L		06/18/20 16:18	1	WJF
Biochemical Oxygen Demand	<1.41		3.00	1.41	mg/L		06/18/20 11:28	1	CJG

Method: 9223B - E. Coli, Most Probable Number

Analyte	Result	Qualifier	RL	RL	Unit	D	Analyzed	Dil Fac	Analyst
E. Coli	**31**		1.0	1.0	MPN/100mL		06/17/20 13:35	1	LBB

Client Sample ID: 001 Composite

Lab Sample ID: 310-184204-4
Matrix: Wastewater
Date Collected: 06/17/20 08:00
Date Received: 06/17/20 12:45

Method: 625.1 - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
2,4,6-Trichlorophenol	<0.00124		0.0103	0.00124	mg/L		06/23/20 18:35	1	DMD
2,4-Dichlorophenol	<0.00113		0.0103	0.00113	mg/L		06/23/20 18:35	1	DMD
2,4-Dimethylphenol	<0.00103		0.0103	0.00103	mg/L		06/23/20 18:35	1	DMD
2,4-Dinitrophenol	<0.00588		0.0206	0.00588	mg/L		06/23/20 18:35	1	DMD
2-Chlorophenol	<0.00113		0.0103	0.00113	mg/L		06/23/20 18:35	1	DMD
2-Nitrophenol	<0.00165		0.0103	0.00165	mg/L		06/23/20 18:35	1	DMD
4,6-Dinitro-o-cresol	<0.00258		0.0103	0.00258	mg/L		06/23/20 18:35	1	DMD
4-Nitrophenol	<0.00258		0.0103	0.00258	mg/L		06/23/20 18:35	1	DMD
p-Chloro-m-cresol	<0.000979		0.0103	0.000979	mg/L		06/23/20 18:35	1	DMD
Pentachlorophenol	<0.00237		0.0103	0.00237	mg/L		06/23/20 18:35	1	DMD
Phenol	<0.00247		0.0103	0.00247	mg/L		06/23/20 18:35	1	DMD

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Analyzed*	*Dil Fac*	*Analyst*
2,4,6-Tribromophenol (SUR)	*61*		*23 - 110*	*06/23/20 18:35*	*1*	*DMD*
2-Fluorobiphenyl (Surr)	*62*		*26 - 110*	*06/23/20 18:35*	*1*	*DMD*
2-Fluorophenol (Surr)	*33*		*10 - 110*	*06/23/20 18:35*	*1*	*DMD*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Bromide	<0.125		0.500	0.125	mg/L		06/18/20 20:00	5	ACJ
Chloride	**11.1**		5.00	2.00	mg/L		06/18/20 20:00	5	ACJ
Sulfate	**22.4**		5.00	3.55	mg/L		06/18/20 20:00	5	ACJ

Client Sample Results

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Client Sample ID: 001 Composite

Lab Sample ID: 310-184204-4
Date Collected: 06/17/20 08:00
Matrix: Wastewater
Date Received: 06/17/20 12:45

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Aluminum	**0.302**		0.0500	0.0120	mg/L		06/19/20 13:10	1	ACJ
Antimony	<0.000510		0.00100	0.000510	mg/L		06/19/20 13:10	1	ACJ
Arsenic	**0.00136**	**J**	0.00200	0.000880	mg/L		06/19/20 13:10	1	ACJ
Barium	**0.0439**		0.00200	0.000280	mg/L		06/19/20 13:10	1	ACJ
Beryllium	<0.000270		0.00100	0.000270	mg/L		06/19/20 13:10	1	ACJ
Boron	<0.0800		0.100	0.0800	mg/L		06/19/20 13:10	1	ACJ
Cadmium	<0.0000490		0.000100	0.0000490	mg/L		06/19/20 13:10	1	ACJ
Chromium	<0.00110		0.00500	0.00110	mg/L		06/19/20 13:10	1	ACJ
Cobalt	**0.000330**	**J**	0.000500	0.0000910	mg/L		06/19/20 13:10	1	ACJ
Copper	**0.00239**	**J**	0.00500	0.00150	mg/L		06/19/20 13:10	1	ACJ
Iron	**0.521**		0.100	0.0500	mg/L		06/19/20 13:10	1	ACJ
Lead	**0.000457**	**J**	0.000500	0.000110	mg/L		06/19/20 13:10	1	ACJ
Magnesium	**17.0**		0.500	0.100	mg/L		06/19/20 13:10	1	ACJ
Manganese	**0.0714**		0.0100	0.00400	mg/L		06/19/20 13:10	1	ACJ
Molybdenum	<0.00110		0.00200	0.00110	mg/L		06/19/20 13:10	1	ACJ
Nickel	<0.00190		0.00500	0.00190	mg/L		06/19/20 13:10	1	ACJ
Selenium	<0.00100		0.00500	0.00100	mg/L		06/19/20 13:10	1	ACJ
Silver	<0.000370		0.00100	0.000370	mg/L		06/19/20 13:10	1	ACJ
Thallium	<0.000260		0.00100	0.000260	mg/L		06/19/20 13:10	1	ACJ
Tin	<0.00240		0.00500	0.00240	mg/L		06/19/20 13:10	1	ACJ
Titanium	**0.00871**	**J**	0.0100	0.00170	mg/L		06/19/20 13:10	1	ACJ
Zinc	<0.0100		0.0200	0.0100	mg/L		06/19/20 13:10	1	ACJ

Method: 245.2 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.000100	*	0.000200	0.000100	mg/L		06/19/20 16:27	1	HIS

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Ammonia	<0.200		0.500	0.200	mg/L		06/25/20 22:34	1	JMH
Total Kjeldahl Nitrogen	**0.809**	**J**	1.00	0.410	mg/L		06/23/20 19:28	1	JMH
Nitrate Nitrite as N	**2.25**		1.00	0.630	mg/L		06/23/20 17:53	10	JMH
Total Phosphorus as P	**0.100**		0.100	0.0390	mg/L		06/18/20 20:12	1	JMH
TOC Dup	**6.88**		1.00	0.470	mg/L		06/22/20 03:51	1	JJB
Sulfide	<1.30		2.00	1.30	mg/L		06/18/20 10:48	1	LBB
Sulfite	<1.50	HF	3.00	1.50	mg/L		06/17/20 21:53	1	JMH
Chemical Oxygen Demand	**45.7**		25.0	24.0	mg/L		06/22/20 09:41	5	WJF
Methylene Blue Active Substances	**0.0250**		0.0250	0.0130	mg/l LAS MW 340		06/18/20 11:45	1	CSS

Analyte	Result	Qualifier	RL	RL	Unit	D	Analyzed	Dil Fac	Analyst
Nitrogen, Organic	<1.00		1.00	1.00	mg/L		06/18/20 12:53	1	LBB

Client Sample ID: Mississippi River Intake

Lab Sample ID: 310-184204-5
Date Collected: 06/17/20 08:00
Matrix: Wastewater
Date Received: 06/17/20 12:45

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Bromide	<0.125		0.500	0.125	mg/L		06/18/20 20:47	5	ACJ
Chloride	**10.8**		5.00	2.00	mg/L		06/18/20 20:47	5	ACJ

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Client Sample ID: Mississippi River Intake

Date Collected: 06/17/20 08:00
Date Received: 06/17/20 12:45

Lab Sample ID: 310-184204-5

Matrix: Wastewater

Method: 300.0 - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Sulfate	**21.9**		5.00	3.55	mg/L		06/18/20 20:47	5	ACJ

Method: 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Aluminum	**0.428**		0.0500	0.0120	mg/L		06/19/20 13:26	1	ACJ
Antimony	<0.000510		0.00100	0.000510	mg/L		06/19/20 13:26	1	ACJ
Arsenic	**0.00143**	**J**	0.00200	0.000880	mg/L		06/19/20 13:26	1	ACJ
Barium	**0.0479**		0.00200	0.000280	mg/L		06/19/20 13:26	1	ACJ
Beryllium	<0.000270		0.00100	0.000270	mg/L		06/19/20 13:26	1	ACJ
Boron	<0.0800		0.100	0.0800	mg/L		06/19/20 13:26	1	ACJ
Cadmium	<0.0000490		0.000100	0.0000490	mg/L		06/19/20 13:26	1	ACJ
Chromium	<0.00110		0.00500	0.00110	mg/L		06/19/20 13:26	1	ACJ
Cobalt	**0.000400**	**J**	0.000500	0.0000910	mg/L		06/19/20 13:26	1	ACJ
Copper	**0.00176**	**J**	0.00500	0.00150	mg/L		06/19/20 13:26	1	ACJ
Iron	**0.676**		0.100	0.0500	mg/L		06/19/20 13:26	1	ACJ
Lead	**0.000623**		0.000500	0.000110	mg/L		06/19/20 13:26	1	ACJ
Magnesium	**17.2**		0.500	0.100	mg/L		06/19/20 13:26	1	ACJ
Manganese	**0.0907**		0.0100	0.00400	mg/L		06/19/20 13:26	1	ACJ
Molybdenum	<0.00110		0.00200	0.00110	mg/L		06/19/20 13:26	1	ACJ
Nickel	<0.00190		0.00500	0.00190	mg/L		06/19/20 13:26	1	ACJ
Selenium	<0.00100		0.00500	0.00100	mg/L		06/19/20 13:26	1	ACJ
Silver	<0.000370		0.00100	0.000370	mg/L		06/19/20 13:26	1	ACJ
Thallium	<0.000260		0.00100	0.000260	mg/L		06/19/20 13:26	1	ACJ
Tin	<0.00240		0.00500	0.00240	mg/L		06/19/20 13:26	1	ACJ
Titanium	**0.0118**		0.0100	0.00170	mg/L		06/19/20 13:26	1	ACJ
Zinc	<0.0100		0.0200	0.0100	mg/L		06/19/20 13:26	1	ACJ

Method: 245.2 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.000100	*	0.000200	0.000100	mg/L		06/19/20 16:29	1	HIS

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Cyanide, Total	<0.00500		0.0100	0.00500	mg/L		06/19/20 21:03	1	JMH
Ammonia	<0.200		0.500	0.200	mg/L		06/25/20 22:10	1	JMH
Total Kjeldahl Nitrogen	**1.12**		1.00	0.410	mg/L		06/23/20 19:46	1	JMH
Nitrate Nitrite as N	**2.37**		0.100	0.0630	mg/L		06/25/20 17:11	1	JMH
Total Phosphorus as P	**0.118**		0.100	0.0390	mg/L		06/18/20 20:10	1	JMH
Phenols, Total	<0.0150		0.0200	0.0150	mg/L		06/18/20 16:33	1	JMH
TOC Dup	**6.60**		1.00	0.470	mg/L		06/22/20 04:07	1	JJB
Total Suspended Solids	**20.0**		15.0	5.10	mg/L		06/18/20 16:18	1	WJF
Sulfide	<1.30		2.00	1.30	mg/L		06/18/20 10:48	1	LBB
Sulfite	<1.50	HF	3.00	1.50	mg/L		06/17/20 21:53	1	JMH
Biochemical Oxygen Demand	<1.41		3.00	1.41	mg/L		06/18/20 11:37	1	CJG
Chemical Oxygen Demand	**31.0**		25.0	24.0	mg/L		06/22/20 09:41	5	WJF
Methylene Blue Active Substances	**0.0197**	**J**	0.0250	0.0130	mg/l LAS MW 340		06/18/20 11:45	1	CSS

Analyte	Result	Qualifier	RL	RL	Unit	D	Analyzed	Dil Fac	Analyst
Nitrogen, Organic	**1.12**		1.00	1.00	mg/L		06/18/20 12:53	1	LBB

Client Sample Results

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Client Sample ID: Mississippi River Intake
Date Collected: 06/17/20 08:00
Date Received: 06/17/20 12:45

Lab Sample ID: 310-184204-5
Matrix: Wastewater

Method: 9223B - E. Coli, Most Probable Number

Analyte	Result	Qualifier	RL	RL	Unit	D	Analyzed	Dil Fac	Analyst
E. Coli	41		1.0	1.0	MPN/100mL		06/17/20 13:35	1	LBB

Accreditation/Certification and Definitions Summary

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

Laboratory: Eurofins TestAmerica, Buffalo

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	88-0686	07-06-20
California	State	2931	04-01-20 *
Connecticut	State	PH-0568	09-30-20
Florida	NELAP	E87672	06-30-20
Georgia	State	10026 (NY)	04-01-21
Georgia	State Program	N/A	03-31-09 *
Georgia (DW)	State	956	04-01-21
Illinois	NELAP	200003	09-30-20
Iowa	State	374	02-28-21
Kansas	NELAP	E-10187	02-01-21
Kentucky (DW)	State	90029	12-31-20
Kentucky (UST)	State	30	04-01-21
Kentucky (WW)	State	KY90029	12-31-20
Louisiana	NELAP	02031	06-30-20
Maine	State	NY00044	12-04-20
Maryland	State	294	04-01-21
Massachusetts	State	M-NY044	06-30-20
Michigan	State	9937	03-31-20 *
Michigan	State Program	9937	04-01-09 *
Minnesota	NELAP	1524384	12-31-20
New Hampshire	NELAP	2337	11-18-20
New Jersey	NELAP	NY455	06-30-20
New York	NELAP	10026	04-02-21
North Dakota	State	R-176	03-31-20 *
Oklahoma	State	9421	09-01-20
Oregon	NELAP	NY200003	06-10-20 *
Pennsylvania	NELAP	68-00281	07-31-20
Rhode Island	State	LAO00328	12-30-20
Tennessee	State	02970	04-01-21
Texas	NELAP	T104704412-18-10	08-01-20
USDA	US Federal Programs	P330-18-00039	02-06-21
Virginia	NELAP	460185	09-14-20
Washington	State	C784	02-11-21
Wisconsin	State	998310390	08-31-20

Laboratory: Eurofins TestAmerica, Chicago

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2903	04-30-20 *
Georgia	State	N/A	04-30-20 *
Georgia (DW)	State	939	04-30-20 *
Hawaii	State	NA	04-30-20 *
Illinois	NELAP	IL00035	04-30-20 *
Indiana	State	C-IL-02	04-30-20 *
Iowa	State	082	05-01-20 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: Eurofins TestAmerica, Chicago (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Kansas	NELAP	E-10161	11-01-20
Kentucky (UST)	State	AI # 108083	04-30-20 *
Kentucky (WW)	State	KY90023	12-31-20
Louisiana	NELAP	02046	06-30-20
Mississippi	State	NA	04-30-20 *
New York	NELAP	12019	04-01-21
North Carolina (WW/SW)	State	291	12-31-20
North Dakota	State	R-194	04-30-20 *
Oklahoma	State	8908	08-31-20
South Carolina	State	77001003	04-30-20 *
USDA	US Federal Programs	P330-18-00018	02-11-21
Wisconsin	State	999580010	08-31-20
Wyoming	State	8TMS-Q	04-30-20 *

Qualifiers

Metals

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
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

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Alliant Energy Corporation
Project/Site: Lansing NPDES Permit Renewal 2020

Job ID: 310-184204-1
SDG: Project #50886

Method	Method Description	Protocol	Laboratory
624.1	Volatile Organic Compounds (GC/MS)	40CFR136A	TAL CF
625.1	Semivolatile Organic Compounds (GC/MS)	40CFR136A	TAL CF
300.0	Anions, Ion Chromatography	MCAWW	TAL CF
200.8	Metals (ICP/MS)	EPA	TAL CF
245.2	Mercury (CVAA)	EPA	TAL CF
1664A	HEM and SGT-HEM	1664A	TAL CF
335.4	Cyanide, Total	MCAWW	TAL CF
350.1	Nitrogen, Ammonia	MCAWW	TAL CF
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL CF
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL CF
365.1	Phosphorus, Total	EPA	TAL CF
420.4	Phenolics, Total Recoverable	MCAWW	TAL CF
9060	Organic Carbon, Total (TOC)	SW846	TAL CHI
I-3765-85	Residue, Non-filterable (TSS)	USGS	TAL CF
Nitrogen,Org	Nitrogen, Organic	EPA	TAL CF
SM 4500 S2 F	Sulfide, Total	SM	TAL CF
SM 4500 SO3 B	Sulfite	SM	TAL CF
SM 5210B	BOD, 5-Day	SM	TAL CF
SM 5220D	COD	SM	TAL CF
SM 5540C	Methylene Blue Active Substances (MBAS)	SM	TAL BUF
9223B	E. Coli, Most Probable Number	SM	TAL CF
1664A	HEM and SGT-HEM (Aqueous)	1664A	TAL CF
200.8	Preparation, Total Metals	EPA	TAL CF
245.1	Preparation, Mercury	EPA	TAL CF
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL CF
365.2/365.3/365	Phosphorus, Total	MCAWW	TAL CF
625	Liquid-Liquid Extraction	40CFR136A	TAL CF
Distill/Ammonia	Distillation, Ammonia	None	TAL CF
Distill/CN	Distillation, Cyanide	None	TAL CF
Distill/Phenol	Distillation, Phenolics	None	TAL CF
SM 4500 S2 C	Sulfide, Sample Pretreatment/Concentration	SM	TAL CF

Protocol References:

1664A = EPA-821-98-002

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

TAL CHI = Eurofins TestAmerica, Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

eurofins | Environment Testing TestAmerica

310-184204 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Alliant Energy Lansing

City/State: CITY Lansing STATE IA | Project: NPDES 2020 Permit Renewal

Receipt Information

Date/Time Received: DATE 6/17/20 TIME 1245 | Received By: JJ

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☒ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☒ Yes	☐ No	*If yes:* Cooler # 1 of 2
Cooler Custody Seals Present?	☒ Yes	☐ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: M | Correction Factor (°C): TD.1

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 5.4 | Corrected Temp (°C): 5.5

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Document: CF-LG-WI-002
Revision: 25
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C
Bacteria temperature criteria is 0 to 10°C

eurofins | Environment Testing TestAmerica

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Alliant Energy Lansing

City/State: CITY Lansing STATE IA | Project: NPDES 2020 Permit Renewal

Receipt Information

Date/Time Received: DATE 6/17/20 TIME 1245 | Received By: JJ

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☒ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☒ Yes	☐ No	*If yes:* Cooler # 2 of 2
Cooler Custody Seals Present?	☒ Yes	☐ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: M | Correction Factor (°C): +0.1

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 11.9 | Corrected Temp (°C): 12.0

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☒ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☒ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Cedar Falls Division
3019 Venture Drive
Cedar Falls, IA 50613

Phone: 319 - 277 - 2401 or 1 - 800 - 750 - 2401
Fax: 319 - 277 - 2425

Company: **Alliant Energy - Lansing**
Send Report To: Glen Thomas
Address: 2320 Power Plant Drive
City/State/Zip Code: Lansing, IA 52151
Telephone Number: 563-538-3143 Fax: 563-538-3140
Sampled by: (Print Name) Glen Thomas
(Signature) Glen Thomas

Your PO #: GENCO0000231118
Invoice To:
Project Manager: Zach Bindert
Project Name: Lansing NPDES 2020 Permit Renewal
Project Number: 50886
Email Address: glenthomas@alliantenergy.com
cc: corycarter@alliantenergy.com

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H2SO4 Plastic (Yellow & White Label)	H2SO4 Glass(Yellow & White Label)	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify	Analyze For: NPDES Renewal 2020	(See Attached Sheets)	RUSH TAT (Must call ahead)	Standard TAT	E-mail results	Fax Results	Send QC with report
002 Grab	6-17-20	08:00	10	X												X					X						
002 Composite	6-17-20	08:00	10		X											X					X						
001 Grab	6-17-20	08:00	12	X												X					X						
001 Composite	6-17-20	08:00	10		X											X					X						
Mississippi River Intake	6-17-20	08:00	12	X												X					X						

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders.

NOTES:
Please see attached sheets for required analyses

Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:	Date	Time
Glen Thomas	6-17-20	10:00						
Shipped Via:			Comments:			Shipped Via:		
Received for TestAmerica by:	Date	Time	Temperature Upon Receipt:	Laboratory Comments:				
	6/17/20	12:45						

Bottle Order Information

Bottle Order: Lansing NPDES Permit Renewal 2020
Bottle Order #: 15557
Request From Client: 6/11/2020
Date Order Posted: 6/11/2020 10:52:17AM
Order Status: Ready To Process
Prepared By: Brian Graettinger
Deliver By Date: 6/15/2020 11:59:00PM
Lab Project Number: 31012457

Order Completion Information

Creator: Brian Graettinger
Filled by:
Sent Date:
Sent Via:
Tracking #:

Sets	Bottles/Set	Qty	Bottle Type Description	Preservative	Method	Matrix	Sample Type	Comments	Lot #
1	1	1	Plastic 1 liter - unpreserved	None	SM5210B_Calc - BOD	Water	Normal		
					I_3765_85 - Residue, Non-filterable (TSS)	Water	Normal		
1	1	1	Sterile w/thio 100 mL	Sodium Thiosulfate	9223B_MPN - Total Coliforms and E. Coli	Water	Normal		
1	2	2	Amber Glass 1 liter - Sulfuric Acid	Sulfuric Acid	1664A - Oil and Grease	Water	Normal		
1	3	3	Voa Vial 40ml - unpreserved	None	624.1_PREC - (MOD) Custom VOC list	Water	Normal		
1	3	3	Voa Vial 40ml - Hydrochloric Acid	Hydrochloric Acid	624.1_PREC - Custom VOC List	Water	Normal		
1	1	1	Plastic 250ml - with Sodium Hydroxide	Sodium Hydroxide	335.4 - Cyanide, Total	Water	Normal		
1	1	1	Amber Glass 500mL - Sulfuric Acid	Sulfuric Acid	420.4 - Phenolics, Total Recoverable	Water	Normal		
1	1	1	Plastic 250ml - with Sulfuric Acid	Sulfuric Acid	350.1 - Nitrogen, Ammonia	Water	Normal		
					351.2 - Nitrogen, Total Kjeldahl	Water	Normal		
					365.1 - Phosphorus, Total	Water	Normal		
					353.2 - Nitrate plus Nitrite as N	Water	Normal		
					5220D - COD	Water	Normal		
1	0	0	No Container	None	Nitrogen,Org - Organic Nitrogen	Water	Normal	Organic Nitrogen	
1	1	1	Plastic 500ml - with Zn Acetate and NaOH	Zinc Acetate and Sodium Hydroxide	SM4500_S2_F - Sulfide	Water	Normal		
1	1	1	Plastic 250ml - with EDTA	EDTA	SM4500SO3_B - Sulfite	Water	Normal		
1	1	1	Plastic 250ml - with Nitric Acid	Nitric Acid	245.2 - Mercury	Water	Normal		
					200.8_CWA - (MOD) Metals by 200.8	Water	Normal		
1	1	1	Plastic 250ml - unpreserved	None	300_ORGFM_28D - (MOD) Anions (all analytes)	Water	Normal		
1	1	1	Plastic 1 liter - unpreserved	None	5540C - MBAS	Water	Normal		
1	2	2	Amber Glass 1 liter - unpreserved	None	625.1_PREC - Acids Semivolatiles List	Water	Normal		

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Please notify your PM immediately if an error is found in shipment. When returning samples, please return all provided QC samples.
Go to http://www.testamericainc.com/customer-support/specialized-instructions-for-field-samplers/ for field sampler instructions.

			Voa Vial 40ml - with Sulfuric Acid	Sulfuric Acid	9060A - (MOD) TOC Duplicates	Water	Normal		
1	1	1	Plastic 1 liter - unpreserved	None	SM5210B_Calc - BOD	Water	Normal		
1	1	1	Sterile w/thio 100 mL	Sodium Thiosulfate	9223B_MPN - Total Coliforms and E. Coli	Water	Normal		
1	3	3	Voa Vial 40ml - unpreserved	None	624.1_PREC - (MOD) Custom VOC list	Water	Normal		
1	3	3	Voa Vial 40ml - Hydrochloric Acid	Hydrochloric Acid	624.1_PREC - Custom VOC List	Water	Normal		
1	1	1	Plastic 250ml - with Sodium Hydroxide	Sodium Hydroxide	335.4 - Cyanide, Total	Water	Normal		
1	1	1	Amber Glass 500mL - Sulfuric Acid	Sulfuric Acid	420.4 - Phenolics, Total Recoverable	Water	Normal		
1	1	1	Plastic 250ml - with Sulfuric Acid	Sulfuric Acid	350.1 - Nitrogen, Ammonia	Water	Normal		
					351.2 - Nitrogen, Total Kjeldahl	Water	Normal		
					365.1 - Phosphorus, Total	Water	Normal		
					353.2 - Nitrate plus Nitrite as N	Water	Normal		
					5220D - COD	Water	Normal		
1	0	0	No Container	None	Nitrogen,Org - Organic Nitrogen	Water	Normal	Organic Nitrogen	
1	1	1	Plastic 500ml - with Zn Acetate and NaOH	Zinc Acetate and Sodium Hydroxide	SM4500_S2_F - Sulfide	Water	Normal		
1	1	1	Plastic 250ml - with EDTA	EDTA	SM4500SO3_B - Sulfite	Water	Normal		
1	1	1	Plastic 250ml - with Nitric Acid	Nitric Acid	245.2 - Mercury	Water	Normal		
					200.8_CWA - (MOD) Metals by 200.8	Water	Normal		
1	1	1	Plastic 250ml - unpreserved	None	300_ORGFM_28D - (MOD) Anions (all analytes)	Water	Normal		
1	1	1	Plastic 1 liter - unpreserved	None	5540C - MBAS	Water	Normal		
1	2	2	Amber Glass 1 liter - unpreserved	None	625.1_PREC - Acids Semivolatiles List	Water	Normal		
1	2	2	Voa Vial 40ml - with Sulfuric Acid	Sulfuric Acid	9060A - (MOD) TOC Duplicates	Water	Normal		
1	1	1	Plastic 1 liter - unpreserved	None	SM5210B_Calc - BOD	Water	Normal		
					I_3765_85 - Residue, Non-filterable (TSS)	Water	Normal		
1	1	1	Plastic 250ml - with Sulfuric Acid	Sulfuric Acid	350.1 - Nitrogen, Ammonia	Water	Normal		
					351.2 - Nitrogen, Total Kjeldahl	Water	Normal		
					365.1 - Phosphorus, Total	Water	Normal		
					5220D - COD	Water	Normal		
					353.2 - Nitrate plus Nitrite as N	Water	Normal		
1	0	0	No Container	None	Nitrogen,Org - Organic Nitrogen	Water	Normal	Organic Nitrogen	
1	1	1	Plastic 250ml - with Nitric Acid	Nitric Acid	200.8_CWA - (MOD) Metals by 200.8	Water	Normal		
					245.2 - Mercury	Water	Normal		
		25							

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Go to http://www.testamericainc.com/customer-support/specialized-instructions-for-field-samplers/ for field sampler instructions.

			Plastic 250ml - unpreserved	None	300_ORGFM_28D - Bromide, Chloride and Sulfate	Water	Normal		
1	2	2	Voa Vial 40ml - with Sulfuric Acid	Sulfuric Acid	9060A - (MOD) TOC Duplicates	Water	Normal		
1	1	1	Sterile w/thio 100 mL	Sodium Thiosulfate	9223B_MPN - Total Coliforms and E. Coli	Water	Normal		
1	1	1	Plastic 500ml - with Zn Acetate and NaOH	Zinc Acetate and Sodium Hydroxide	SM4500_S2_F - Sulfide	Water	Normal		
1	1	1	Plastic 250ml - with EDTA	EDTA	SM4500SO3_B - Sulfite	Water	Normal		
1	1	1	Plastic 1 liter - unpreserved	None	5540C - MBAS	Water	Normal		
1	1	1	Plastic 250ml - with Sodium Hydroxide	Sodium Hydroxide	335.4 - Cyanide, Total	Water	Normal		
1	1	1	Amber Glass 500mL - Sulfuric Acid	Sulfuric Acid	420.4 - Phenolics, Total Recoverable	Water	Normal		

Notes to Field Staff: 9

Scan QR code for field sampler instructions

Health and Safety Notes:

Preservative	Comment
EDTA	CAUTION! CONTAINS EDTA. Harmful if inhaled. Use adequate ventilation. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Hydrochloric Acid	CAUTION! CONTAINS 1:1 HYDROCHLORIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Nitric Acid	CAUTION! STRONG OXIDIZER! CONTAINS 1:1 NITRIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Sodium Hydroxide	CAUTION! STRONG CAUSTIC! CONTAINS SODIUM HYDROXIDE PELLETS. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Sodium Thiosulfate	CAUTION! CONTAINS 10% SODIUM THIOSULFATE. Harmful if inhaled. Use adequate ventilation. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Sulfuric Acid	CAUTION! CONTAINS 1:1 SULFURIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.
Zinc Acetate and Sodium Hydroxide	Contains 2N Zinc Acetate. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. CAUTION! STRONG CAUSTIC! CONTAINS SODIUM HYDROXIDE PELLETS. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water.

Relinquished By	Company	Date	Time	Received By	Company	Seal #: Seal #: Seal #:
Relinquished By	Company	Date	Time	Received By	Company	Seal #: Seal #: Seal #:

Please notify your PM immediately if an error is found in shipment. When returning samples, please return all provided QC samples.
Go to http://www.testamericainc.com/customer-support/specialized-instructions-for-field-samplers/ for field sampler instructions.

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

Client Information (Sub Contract Lab)	Sampler	Lab PM: Graettinger, Brian C	Carrier Tracking No(s):	COC No: 310-28040 1
Client Contact: Shipping/Receiving	Phone	E-Mail: brian.graettinger@testamericainc.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Iowa		Job #: 310-184204-1
Address: 2417 Bond Street,	Due Date Requested: 6/29/2020	Analysis Requested		Preservation Codes:
City: University Park	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: IL, 60484	310-184204 COC			Other:
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	PO #			
Email	WO #			
Project Name: Lansing NPDES Permit Renewal 2020	Project #: 31012457			
Site	SSOW#			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9060/ TOC Duplicates	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
002 Composite (310-184204-2)	6/17/20	08:00 Central		Water			X	2	
001 Composite (310-184204-4)	6/17/20	08:00 Central		Water			X	2	
Mississippi River Intake (310-184204-5)	6/17/20	08:00 Central		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

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: 1	Special Instructions/QC Requirements
Empty Kit Relinquished by:	Date: Time: Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	6/17/20 1625		[signature]	6/18/20 0935	TA CHI
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No :	Cooler Temperature(s) °C and Other Remarks: 3.8